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Revitalization of Agricultural Technology Management Agency(ATMA): A comparative study in Thiruvananthapuram and Kottayam districts of Kerala

by

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(2012 - 11 - 133)

THESIS

**Submitted in partial fulfilment of the
requirements for the degree of**

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Faculty of Agriculture

Kerala Agricultural University

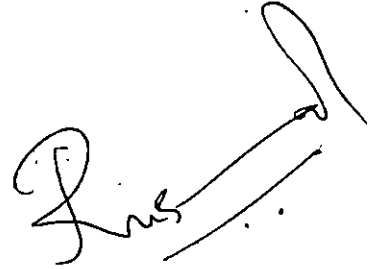


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2015

DECLARATION

I, hereby declare that this thesis entitled “**Revitalization of Agricultural Technology Management Agency (ATMA): A comparative study in Thiruvananthapuram and Kottayam districts of Kerala**” is a bonafide record of research done by me during the course of research and the thesis has not previously formed the basis for the award to me of any degree, diploma, associateship, fellowship or other similar title, of any other University or Society.



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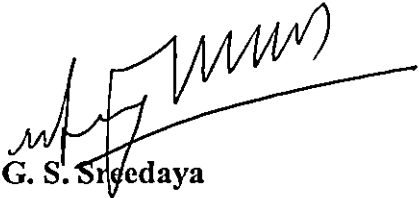
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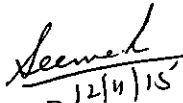
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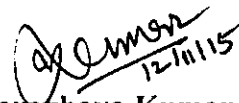
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My beloved parents

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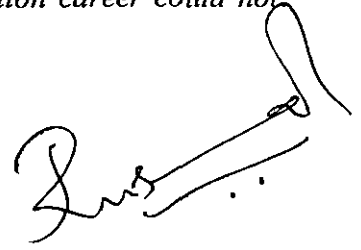
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Rubeena. A

Vellayani

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LIST OF ABBREVIATIONS

AA	Agricultural Assistant
AO	Agricultural Officer
ATMA	Agricultural Technology Management Agency
ADA	Assistant Director of Agriculture
AMC	ATMA Management Committee
BAP	Block Action Plan
BFAC	Block Farmers Advisory Committee
BTM	Block Technology Manager
BTT	Block Technology Team
CIGs	Commodity Interest Groups
CSC	Common Service Centres
DAAPs	District Agricultural Action Plans
DAH	Department of Animal Husbandry
DOA	Department of Agriculture
DOF	Department of Fisheries
DPD	Deputy Project Director

LIST OF ABBREVIATIONS COBTINUED

DTM	District Technology Manager
FAC	Farmer Advisory Committee
FA	Field Assistant
FF	Farmer Friend
FFs	Farmer Federations
FFS	Farmer Field School
FIGs	Farmer Interest Groups
FOs	Farmer Organizations
FSA	Farming System Approach
GDP	Gross Domestic Product
GB	Governing Body
GALASA	Group Approach for Locally Adapted and Sustainable Agriculture
ICT	Information and Communication Technology
IIM	Indian Institute of Management
INM	Integrated Nutrient Management
IPM	Integrated Pest management

LIST OF ABBREVIATIONS COBTINUED

IT	Information Technology
ITD	Innovations in Technology Dissemination
KAU	Kerala Agricultural University
KCC	Kisan Call Centre
MoU	Memorandum of Understanding
NARP	National Agricultural Research Project
NATP	National Agricultural Technology Project
NGOs	Non-government organization
PRA	Participatory Rural Appraisal
PRIs	Panchayati Raj Institutions
PD	Project Director
PPP	Public-Private Partnership
R-E-F	Research-Extension-Farmer
RPS	Rubber producers Society
SD	Standard Deviation
SREP	Strategic Research and Extension Plan

LIST OF ABBREVIATIONS CONTINUED

SEWP	State Extension Work Plan
SRI	System of Rice Intensification
SHG	Self Help Group
SAMETI	State Agricultural Management and Extension Training Institute
SGSRY	Swarnajayanti Gram Swarozgar Yojana
&	And
%	Per cent
Kg	Kilogram
<i>et al.</i>	And others
Fig.	Figure
No.	Number
Sl.	Serial
N	Sample size
i.e.	That is

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INTRODUCTION

1. INTRODUCTION

The Indian agriculture is at the cross roads today. Its strength to alleviate poverty and hunger is well recognized, yet, the agricultural growth rate in the past years has been visibly less impressive and the productivity in the agricultural sector continues to be low compared to the international standards. While investments in research and extension have increased in recent years, their impact on small holder farmers' livelihoods remains debatable. Even when these investments may address relevant problems of the farmers, the benefits of improved technologies will not fully accrue to the farmers. The yield gap between research stations and farmers' fields remains high. For translating research results into tangible gains at farm level, well-functioning agricultural extension and advisory services are required.

Public sector extension has undergone considerable changes since independence. Initially, the focus of extension was on human and community development. Since extension had focused on disseminating green revolution technology, there has been a steady progression toward technology transfer within the policy framework of food security. The most significant development was the introduction of the Training and Visit (T&V) extension management system in the mid-seventies. T&V extension was well suited to the rapid dissemination of broad-based crop management practices for the high yielding wheat and rice varieties released since the mid-sixties (Singh *et al.*, 2009).

The constraints observed in the T&V and post T&V programmes called for a major policy intervention to make the extension system farmer driven and farmer accountable through process and institutional reforms mechanism. India, therefore, undertook major reform initiatives to create a demand-driven, broad-based and holistic agricultural extension system. As a result, the Government of India has drawn up a new

programme to revive extension work in consultation with the States . This institutional mechanism in the form of Agricultural Technology Management Agency (ATMA) at district level was pilot tested under Innovations in Technology Dissemination (ITD) component of National Agricultural Technology Project (NATP) in seven states of the country namely, Andhra Pradesh, Bihar, Himachal Pradesh, Punjab, Orissa, Jharkhand and Maharashtra covering 28 districts from 1998 to 2004. With the successful experimentation of the project, the Govt. of India decided to extend the ATMA programme as a full fledged scheme during 2005-06.

The shift from a pilot project to national level project within a span of five years without process evaluation, resulted in a lot of constraints for ATMA scheme. Realising the challenges posed by these constraints, the scheme was revitalized under Support to 'State Extension Programmes for Extension Reforms' in 2010 with a strong manpower, infrastructure and activity such as provision of specialist and functionary support at different levels, innovative support through a 'Farmer Friend' at village level, revision in ATMA Cafeteria (i.e. list of extension related activities to choose from) to include some additional activities and to provide for enhanced unit costs for some of the activities. Besides Agro Service Centres are proposed at block level to provide various services like mechanization, plant protection, weather advisory and soil testing. Thus the existing ATMA is revitalized to ensure that key constraints under the scheme are adequately addressed. Through enforcing elements like decentralized decision making, involvement of private sector in agricultural extension, group approach, farming system approach, gender concern, research-extension-farmer linkages, farmer oriented activities, farm information dissemination, convergence and sustainability of extension services, new vigour and more close attention in the implementation of ATMA activities have been ensured.

The state of Kerala is implementing ATMA related activities from the year 2005-06 onwards. The districts of Thiruvananthapuram, Alappuzha, Palakkad,

Idukki and Wayanad were included in the first phase of ATMA scheme. Currently, it is operational in all the districts of the State. The Directorate of Agriculture had assigned the Institute of Rural Management Anand (IRMA) for conducting third party monitoring and evaluation of the ATMA scheme for the year 2011-12. The IRMA (2012) study revealed that there was a wide difference in the districts in the efficiency of ATMA scheme implementation and called for further strengthening of ATMA in Kerala.

In this circumstance, the present study entitled “Revitalization of Agricultural Technology Management Agency (ATMA): A comparative study in Thiruvananthapuram and Kottayam districts of Kerala.” was formulated with the following objectives.

1.1. SPECIFIC OBJECTIVES

1. To Compare the implementation of revitalized ATMA activities in Thiruvananthapuram and Kottayam districts with a view to suggest measures for further improvement.
2. To assess impact of ATMA in the sample districts
3. To identify the constraints experienced by the stakeholders
4. To suggest measures for improvement of ATMA in Kerala.

1.2. NEED FOR THE STUDY

The performance of agricultural development programmes always has a mixed response in attaining the desired objectives and even well conceived agricultural projects in the past have suffered from implementation problems. An effective monitoring and evaluation mechanism is an essential component for the success of any project particularly, where multiple agencies are involved in implementation with a very diverse target group. The present study aims at assessing

the project impact on the target beneficiaries in two districts and in reforming the extension system in respect of various processes envisaged under the scheme and to make suitable recommendations for improving impact of the new system.

1.3. SCOPE AND IMPORTANCE OF THE STUDY

The present investigation was taken up to compare the Thiruvananthapuram and Kottayam districts with respect to implementation of revitalized ATMA activities. The future of agriculture depends mainly on the effective implementation of the development programmes. Thus the study gives equal importance to the constraints experienced by the stakeholders in ATMA programme. The results of the study will be useful for the researchers, extension workers and policy makers as it analyses ATMA programme in different dimensions. The results of the study pertaining to the suggestions would help in streamlining ATMA especially in terms of implementation to get the matching response for the massive efforts and investments.

1.4. LIMITATIONS OF THE STUDY

The study has inherent limitations of small sample size, restricted time and other resources. However, utmost care has been taken to make the study as perfect as possible. Since the work was carried out in only two districts of Kerala, *generalization of results to other areas may not be appropriate.*

Very limited studies were available about ATMA in Kerala. So the important limitation was the dearth of sufficient literature. Since the responses were based on the perception of respondents, due care was taken to ensure high reliability of data through discussions.

1.5. PRESENTATION OF THE STUDY

The report of the study has been spread out under five chapters as given below. The first chapter deals with the introduction which explains the importance of the topic, objectives, scope and limitation of the study.

The second chapter covers the review of the study related to the investigation. The third chapter relates to the details of the methodology used in the process of investigation. In the fourth chapter, the results and discussions are clubbed and the fifth chapter summarizes the study highlighting the salient findings. The references and appendices are furnished at the end.

REVIEW OF LITERATURE

2. REVIEW OF LITERATURE

A scrutiny of available literature is of great value in gaining insights into the research problem under study. As the studies on ATMA in Kerala was less, the works on ATMA reported from other states were reviewed to identify and internalize different variables that are relevant to the different areas of present research and to presume probable relationship among them. Hence, the available studies that are directly or indirectly related to the topic of research from various sources are exhaustively reviewed. The literatures based on the objectives of the present study are elucidated under the following sub headings.

2.1 Genesis of ATMA

2.1.1. Concept of ATMA Model

2.1.2. Experiences/ Evaluation Reports of NATP-ATMA-ITD Pilot Testing

2.1.3. Graduation of ATMA

2.2. Perception about the Implementation of Revitalized ATMA Activities

2.3. Concept of Impact Parameters of ATMA

2.4. Profile Characteristics of Stakeholders

2.4.1. Profile Characteristics of Farmers

2.4.2. Profile Characteristics of Implementing Officers

2.4.3. Profile Characteristics of Members of Decision Making Authorities

2.4.4. Profile Characteristics of NGOs and Private Partners

2.5. Constraints Perceived by the Stakeholders

2.1. GENESIS OF ATMA

The extension system of our nation which is primarily responsible for delivery of technical messages to farmers is operated by the State Department of Agriculture (DOA) through the state, district and block level machinery. Other state government departments such as Animal Husbandry, Horticulture, Soil and Water Conservation and Fisheries have been providing very limited extension services. The research centres and agricultural universities play a very limited role in extension service. The system however is more pre-occupied with implementation of a number of central and state sector schemes having input or subsidy delivery. Moreover the performance of the main extension system has been adversely affected by the difficulty in recruiting and retaining extension staff due to budgetary constraints, depleting operational support and also the technology upscaling of technical staff is found to be minimal in many places. This has resulted in the dependence of farmers on input dealers and others as sources of information.

The challenges posed by globalization, revolution in information and communication technology (ICT), rising population and the consequent demand for sustainability have prompted to have a re-look on the existing extension system in India and re-orient it with proper direction. During the mid-1990s, the Government of India and the World Bank began exploring new approaches to extension that would address these system problems and constraints. The result was a new decentralized extension approach which would focus more directly on agricultural diversification and increasing farm income and rural employment. The central institutional innovation that emerged to address these system problems was the 'Agricultural Technology Management Agency' or ATMA model that was introduced at the district level to integrate extension programs across the line departments (i.e., more of a farming systems approach), because extension activities have been largely carried out by state Departments of Agriculture (DOA). Other line departments like Animal Husbandry (DAH), and Fisheries (DOF), have primarily focused on the provision of subsidized inputs and

services to farmers, with little attention and few resources being allocated to extension. These line departments operated largely independently, with very little collaboration between the departments and their field staff. Another key element of the ATMA model is to link research and extension activities within each district and decentralize decision-making through "bottom-up" planning procedures that would directly involve farmers and the private sector in planning and implementing extension programs at the block and district-levels.

The National Agricultural Technology Project (NATP) was initiated in India with World Bank support in 1998 and ATMA was established in pilot project districts in a phased manner. ATMA was considered as a dynamic instrument for introducing major changes in the Agricultural Research and Extension systems of the country in addition to developing their capabilities to meet future challenges. The project was initiated by Ministry of Agriculture, Govt. of India with the financial assistance of World Bank and was implemented with the assistance of National institute for Agricultural Extension Management (MANAGE, Hyderabad) in 28 districts covering 7 states, viz. Andhra Pradesh, Bihar, Jharkhand, Himachal Pradesh, Maharashtra, Orissa and Punjab over a period of 5 years (1998-2003).

The Extension component termed as "Innovations in Technology dissemination" (ITD) envisages an integrated extension delivery at district level. The purpose of this component was to test new approaches to technology transfer, new organizational arrangements and operational procedures. The major goal is to decentralize decision making to the district level through the creation of Agricultural Technology Management Agency (ATMA) as a registered society. The second goal is to increase farmer input into programme planning and resource allocation especially at the block level and increase accountability to stakeholders. The third goal is to increase programme coordination and integration. Funds were provided to 28 pilot districts in seven states to create Agricultural Technology Management Agency which brought together researchers, extensionists, farmers and other stakeholders (including NGOs and the corporate sector) to make, on the

basis of joint diagnostic studies, district extension plans and recommendations for expanded adaptive research to introduce innovations in technology dissemination matched to local needs and characteristics.

Four districts in each of the seven participating states are identified for pilot testing as detailed below.

Table. 1. ATMA Pilot Districts

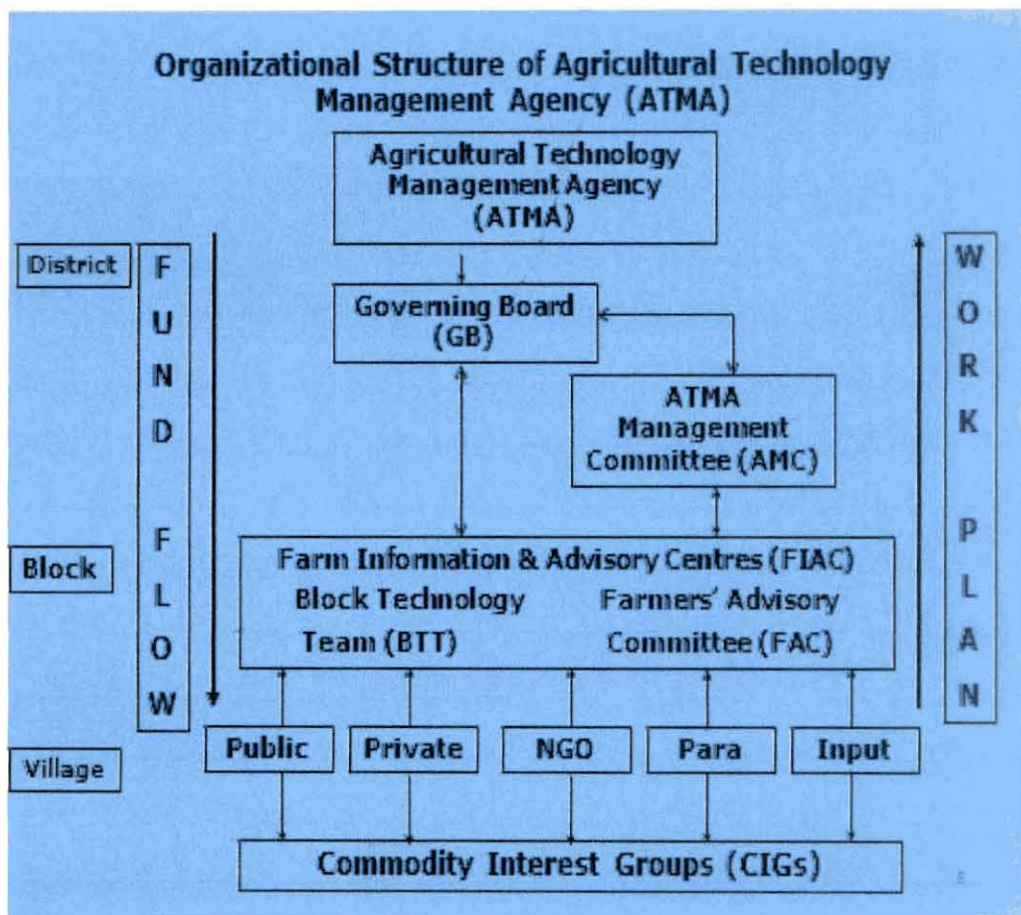
State	Districts
Andhra Pradesh	Kurnool, Prakasam, Adilabad and Chittoor
Bihar	Muzaffarpur, Madhubani, Munger, Patna Rural
Jharkhand	Dumka, Jamtara, Palamau, Chaibara
Himachal Pradesh	Shimla, Hamirpur, Kangra, Bilaspur
Maharashtra	Ahmednagar, Amaravati, Aurangabad, and Ratnagiri
Orissa	Khurda, Koraput, Ganjam, Sambhalpur
Punjab	Gurdaspur, Jalandhar, Sangrur and Faridkot

2.1.1. Concept of ATMA Model

The Agricultural Technology Management Agency (ATMA) is an autonomous organization registered under the "Societies Registration Act of 1860" that has considerable operational flexibility. For example, it can receive and dispense government funds, enter into contracts, maintain revolving funds, collect fees and charge for services. In addition, it operates under the direction and guidance of a Governing Board (GB) that determines program priorities and assesses program impacts. ATMA is headed by a Project Director (PD) who reports directly to the GB. It is the PD that helps coordinate and integrate all agricultural research and extension activities carried out within the district. The PD serves as chair of the ATMA Management Committee (AMC) which includes

the heads of all line departments and the heads of research organizations within the district including the Krishi Vigyan Kendra (KVK) and Zonal Research Station (ZRS). Each district has a KVK which is multidisciplinary and plays a critical role in both on-farm research and training farmers in new production and value-added processing technologies. The organizational structure of the ATMA model is shown in Figure 1:

Figure1. Organizational structure of Agricultural Technology Management Agency



2.1.1.1. Strategic Research and Extension plan (SREP)

One of the first tasks of ATMA is to facilitate the preparation of Strategic Research and Extension Plan (SREP) of the district. The SREP is prepared through participatory methodologies such as Participatory Rural Appraisal (PRA) involving all the stakeholders and farmers. The SREP contains detailed analysis

of all the information on existing farming systems in the district and research – extension gaps required to be filled-up. It also prioritizes the research–extension strategies within the district. It becomes the basis for developments of work plans at block or district level.

2.1.1.2. State Extension Work Plan (SEWP)

Based on the research-extension strategies given in the SREPs, block or district level plans are developed by each ATMA. The SEWP developed at state level shall contain a consolidated activity-wise plan incorporating all the District Agriculture Action Plans (DAAPs) in the state and state level activities to be carried out with activity-wise budgetary requirement as per the norms prescribed in the cafeteria. It will also indicate all other extension activities that may be undertaken from out of resources provided under any other scheme of the Centre or State Governments.

2.1.1.3. Cafeteria of Activities

The Cafeteria includes cost norms and ceilings applicable for each activity. Under the Cafeteria, activities to be undertaken at State and District level are categorized separately. The state level activities include support for upgrading state level training institutions such as SAMETI, HRD of extension functionaries, organization of state level agri-exhibitions and monitoring and evaluation of the Scheme. District level activities are further categorized in four groups namely farmer oriented activities, farm information dissemination, research-extension-farmer (R-E-F) linkages and administrative expenses.

2.1.1.4. ATMA Governing Board (ATMA GB)

The ATMA GB sets program priorities and provides guidance as to how research and extension programs are implemented within the district. The composition of the GB provides an equal balance between the heads of the line departments and research units within the districts and the stakeholder

representatives including a cross-section of farmers, women, disadvantaged groups and private sector firms within the district. The GB is chaired by the District Magistrate or Collector who is the highest ranking government official in the district; the ATMA PD serves as Member Secretary.

2.1.1.5. ATMA Management Committee (AMC)

The ATMA Management Committee (AMC) serves as the Secretariat of the GB and helps coordinate and integrate research and extension activities within the district. Program requests come from each block and the AMC scrutinizes these requests on the basis of technical, financial and management criteria. The AMC then sends these requests to the GB for review and final approval.

2.1.1.6. ATMA Personnel

By design, the number of personnel assigned to ATMA's headquarters is very small, so this organization does not become another government agency. The ATMA staff includes the PD, a deputy project director (DPD), an accountant, computer operator, secretary, driver and watchman. With the exception of the PD and DPD, all the other support staff are hired on contract basis and they do not become government employees.

2.1.1.7. Farm Information and Advisory Centres (FIACs)

Established at the block-level, FIAC in each project district and by design has become the single-window delivery mechanism for extension programs within the block. It has two arms, namely; Block Technology Teams (BTTs) and Farmers Advisory Committee (FACs) as described below

2.1.1.8. Block Technology Teams (BTTs)

It includes technical officers from the Departments of Agriculture, Horticulture, Plant Protection, Soil Conservation, Animal Husbandry (including

Veterinary Service), Fisheries, Sericulture, Cooperatives and Marketing. The most senior officer within the block serves as the head or convener of the BTT. The role of the BTT is to consult with the Farmer Advisory Committee (FAC) and then to develop a comprehensive extension program called a Block Action Plan (BAP) which is consistent with farmer needs.

2.1.1.9. Farmer Advisory Committee (FAC)

The FAC is composed entirely of farmers who represent different socio-economic categories of farmers within the block. The role of the FAC is to advise the BTTs on extension priorities for the block. In addition, the FAC reviews and approves the annual BAPs prepared by the BTTs before they are submitted to the ATMA for funding. Then, the FAC monitors and provides feedback to the BTT on BAP implementation. In short, these FACs have become an integral part of the formal feedback mechanism between farmers and the heads of the research and extension programs within the district.

2.1.1.10. Farmer Interest Groups (FIGs)

One important objective of the ATMA approach is to redirect extension activities toward diversification into high-value crops and products and the overall goal of increasing farm income and rural employment. Therefore, in pursuing this market-driven approach to extension, it became essential to get farmers organized around specific crops or products where there is market demand and that are appropriate for the agro-ecological conditions and resources of different farmer groups. In addition for the successful supply to different markets, it was also essential to get these groups organized and to create an efficient supply chain. Once these different FIGs are organized at the village level, they soon began to organize along crop or product lines as block-level farmer associations (FAs) and district-level Farm Federations (FFs).

2.1.2. Experiences/ Evaluation Reports of NATP-ATMA-ITD Pilot Testing

The implementation of the ITD component of NATP was monitored and evaluated by an independent agency, the Indian Institute of Management (IIM), Lucknow. The monitoring and evaluation reports revealed that institutional and operational reforms, had been largely achieved (IIM Lucknow, 2004a). In addition, IIM Lucknow documented the following project impacts:

- More than 10,800 crop or product-based FIGs had been organized at village level with 85 Field Assistants or Farmer Friends being organized at the block and district levels.
- Approximately 7,00,000 farmers including over 1,00,000 women farmers directly benefited from these new extension programs through a combination of exposure visits, farmer training courses, on-farm trials, demonstrations and so forth.
- More than 250 farmer-led successful innovations had been implemented and documented within the ATMA districts (IIM-Lucknow, 2004b).
- ATMA programs have contributed directly to increased rural employment through agricultural diversification such as the production, processing and marketing of high-value, labour intensive crops and products like vegetables, mushrooms, vermi-composting, ornamental flowers, medicinal plants, fisheries, poultry, dairy and beekeeping.
- Finally, ATMAs have promoted eco-friendly, sustainable agricultural technologies, such as Integrated Pest Management (IPM), Integrated Nutrient Management (INM), organic farming and the use of water conservation practices, including well recharging, converting from water intensive crops such as paddy and wheat to water extensive crops such as vegetables, ornamental flowers, maize, oilseeds and pulses. Also, all ATMAs have promoted the use of micro irrigation systems.

In addition to these institutional and technological innovations, IIM-Lucknow empirically documented the following impacts of the ATMA approach on the cropping systems and farm income in the 28 project districts during the four-year period from 1999-2003.

- Horticultural cropping area increased from twelve to sixteen percent.
- Area under cultivation of Oilseed increased from three to eleven percent.
- Area under cultivation of herbs, medicinal and aromatic crops increased from one to five percent.
- Area under cultivation of cereals declined from fifty five to forty seven percent but yield increased fourteen percent resulting in no loss in total food crop production.
- Average farm income in project districts increased to twenty four per cent, in contrast with only five per cent in non project districts (Tyagi and Verma, 2004).

Singh and Swanson (2005) reported that the medicinal and aromatic plants cultivation under ATMA in Patna district which started with growing Vinca Rosa by five FIGs in 2000 had spread to a network of 50 FIGs. Therefore, it can be observed that ATMA scheme is providing opportunity to farmers to start new enterprises through its diversification strategy. Many farmers adopted new technology and started small scale agricultural enterprises due to interventions under ATMA implementation.

2.1.3. Graduation of ATMA

This successful experiment served as a basis to launch the Scheme "Support to State Extension Programmes for Extension Reforms" in its first phase since 2005-06. Under the scheme Government of India had progressively scaled-up the ATMA model to all 592 rural districts in India. ATMA was implemented in Kerala in 2006 in six districts viz Thiruvananthapuram, Alappuzha, Palakkad,

Idukki, Wayanad and Kasaragod and it was extended to remaining districts in the subsequent stages of expansion.

2.1.3.1. ATMA Expansion Phase

Sulaiman and Hall (2008) observed that ATMA has failed to address some of the major institutional challenges of agricultural extension. For instance, even now ATMA functions as an agency for technology dissemination and is funded and evaluated for this function only. There is also an apparent reluctance to deal with some of the operational bottlenecks that constrain development of public-private partnerships and which are probably a prerequisite for reinventing extension, they observed. The technical support and funding available during the pilot stage was not available at the expansion phase. Lack of dedicated manpower, functional autonomy and attitudinal barriers at all levels further constrained ATMA from achieving its goals.

Though ATMA pilot stage was a success, a lot of pitfalls were reported by Glendenning and Babu (2011). The model has been scaled up quickly, without additional analysis or consideration of the different issues that would arise when moving from a heavily financed pilot programme where scale and complexity issues across a diverse country like India increase manifold. The speed with which ATMA has been spread throughout India, moving from a pilot stage to national implementation in five years, without process evaluation, has been one of its greatest weaknesses, they added.

2.1.3.2. Revised Guidelines on ATMA Implementation

In June 2010, the Central government issued revised guidelines on ATMA implementation mainly to address the constraints associated with the national implementation during the past five years under 'Support to state extension programs for extension reforms' scheme. The revisions included hiring exclusive staff for ATMA at the district and block levels, inclusion of farmer advisory

committees at the block, district and state levels and greater emphasis on ATMA's links to the KVKs. Presently ATMA is operational in 603 districts of India spread over 28 States and three Union Territories. Provision of separate staff for ATMA has brought improved attention to ATMA. The revised 2010 guidelines are yet to be fully implemented in all states though this is expected shortly. With improved links to KVKs, better convergences among different schemes/departments/agencies and greater focus on commodity interest groups, ATMA is expected to strengthen Indian extension system during the XIIth Plan 2012-2017.

The revised scheme implemented through the institutional mechanism given by DAC (2010) is detailed below:

State Level:

- (i) The State Level Sanctioning Committee (SLSC) set up under Rashtriya Krishi Vikas Yojana (RKVY) is the apex body to approve State Extension Work Plan (SEWP) which will form a part of the State Agriculture Plan (SAP).
- (ii) The SLSC will be supported by the Inter Departmental Working Group (IDWG). IDWG is responsible for day-to-day coordination and management of the Scheme activities within the State.
- (iii) The State Nodal Cell (SNC) consisting of the State Nodal Officer and the State Coordinator (along with supporting staff) will ensure timely receipt of District Agriculture Action Plans (DAAPs), formulation of State Extension Work Plan (SEWP) duly incorporating Farmers' feed back obtained through State Farmer Advisory Committee and its approval by the SLSC. The SNC will then convey the approval and monitor implementation of these work plans by SAMETIs and ATMAs. The SAMETIs will draw-up and execute an Annual Training Calendar for capacity building of the Extension functionaries in the

State. While doing so, the SAMETI will check duplication and overlapping of training content, training schedule as well as trainees.

District Level:

ATMA is an autonomous institution set up at district level to ensure delivery of extension services to farmers. ATMA Governing Board is the apex body of ATMA which provides overall policy direction. ATMA GB will be assisted by the District ATMA Cell comprising PD ATMA, Dy. PDs and Staff in the discharge of its functions. ATMA Management Committee is the executive body looking after implementation of the scheme. District Farmers Advisory Committee is a body to provide farmer's feedback for district level planning and implementation. With dedicated staff provided for the ATMA, it will continue to be the district level nodal agency responsible for overall management of agriculture extension system within the district, including preparation of Strategic Research and Extension Plan (SREP).

Block Level:

At the Block level, two bodies viz. Block Technology Team (BTT) and Block Farmers Advisory Committee (BFAC) shall continue to function jointly. BFACs shall represent Farmer Interest Groups (FIGs) / FOs existing within the block on rotation basis to advise the BTT. The Block ATMA Cell consisting of these two bodies, Block Technology Manager and Subject Matter Specialists will provide extension support within the Block, through preparation and execution of Block Action Plans (BAPs).

Village Level:

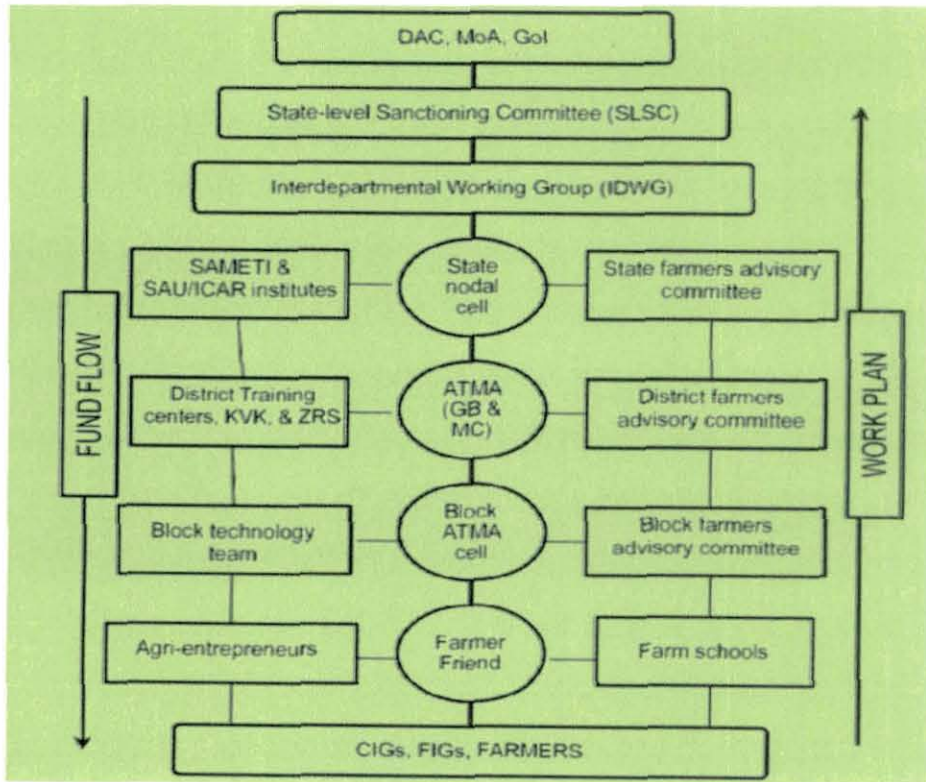
- (i) The Farmer Friend (FF) will serve as a vital link between extension system and farmers at village level (one for every two villages). The

FF will be available in the village to advise on agriculture and allied activities. The FF will mobilize farmers' groups and facilitate dissemination of information to such groups, individual farmers and farm women directly through one to one interaction individually or in groups and also by accessing information / services on behalf of farmers as per need through Common Service Centres (CSC) / Kisan Call Centres (KCC).

- (ii) Wherever available under their respective schemes, agri entrepreneurs will supplement the efforts of extension functionaries by making quality inputs available to the farmers and by providing them critical technical advice
- (iii) Farm Schools will serve as a mechanism for farmer-farmer extension at 3 to 5 focal points in every Block.

The organizational structure at various levels has been depicted in the Figure 2.

Figure 2. Revised structure of the Agricultural Technology Management Agency



(DAC, 2010)

2.1.3.3. Impact Studies of Revised ATMA

Sulaiman (2012) studied the performance of ATMA in Maharashtra state. He observed that ATMA has brought visibility to extension and better appreciation for extension service in Maharashtra. He recommended enhanced funding and ensuring manpower support for ATMA and more focus on capacity development.

From a similar study on ATMA in Himachal Pradesh, Sulaiman and Mittal (2012) reported that ATMA has strengthened the design and delivery of agricultural extension services in Himachal Pradesh. It brought additional funds for extension activities and additional staff for extension at the district and block levels. If ATMA needs to make a larger impact, it should have a bigger allocation for its activities and should also have flexibility to modify the financial norms given in the centrally generated ATMA guidelines to suit the local situations, they observed.

2.1.3.4. ATMA in Kerala

In Kerala , ATMA is being implemented since 2005-06. ATMA is one of the efficient approaches in delineating advanced technologies in the field of Agriculture, Animal Husbandry, Dairy, Fisheries, etc. through the convergence of development departments, research institutions, various projects and schemes at all levels. A number of farmer oriented activities such as exposure visits, trainings, demonstrations, farm schools, group organization and other information and communication programmes are taken as part of ATMA based on the SREP developed for each district following the farming systems approach.

An evaluation of study on the implementation of ATMA in Kerala has been taken up by IRMA in 2010-11. IRMA study revealed that there was a wide

difference among districts in the efficiency of ATMA implementation. They also opined the need for further strengthening ATMA in Kerala by concentrating on the quality of achievement rather than attainment of physical targets. With a view to revitalize agricultural advisory services in the state, Kerala State Planning Board initiated a series of programmes from 2010-11 onwards. The mapping of agro-ecological units, soil fertility status, mapping of ITK and farmer innovations in agriculture were taken up in a project mode to plan and implement science & technology based agricultural development programmes in the states. Similarly to plot the research and extension gaps, revised SREP was proposed for each district in a participatory mode during 2011-12. Also to bridge the gaps in transfer of technology using a new approach called LEADS which was based on the concept of farmer to farmer extension was implemented on a pilot basis in four districts of Kollam, Palakkad, Kannur and Wayanad.

An analysis of revised SREP of the districts indicated that a number of activities identified for implementation in a district specific manner would not be supported with ATMA framework by Govt. of India. In order to overcome these difficulties and to revitalize agricultural extension in the states further, the ATMA PLUS scheme was formulated by Dept. of Agriculture, Govt. of Kerala for implementation during 2013-14 under state plan scheme. Besides enhancing the expenditure norms for ATMA cafeteria activities, ATMA PLUS envisages the several innovations suitable to Kerala conditions. The critical scrutiny of the extension and advisory services contemplated under ATMA approaches reveal that these innovations in technology discriminations are aimed at increasing the production and profitability of agricultural enterprises of small and marginal farmers in the state in an integrated manner involving all the stakeholders concerned following a science based approach.

2.2. PERCEPTION ABOUT THE IMPLEMENTATION OF REVITALIZED ATMA ACTIVITIES

In the present study, a comparison of the perception of implementation of revitalized ATMA activities in the two districts was made in terms of perception of respondents towards ten different components of ATMA. Hence, the related literature is reviewed here under:

2.2.1. Perception

Like most concepts within the social science disciplines, perception has been defined in a variety of ways since its first usage. From the lay man's perspective, perception is defined as an act of being aware of one's environment through physical sensation which denotes an individual's ability to understand.

Taylor *et al.* (1980) refers perception as the mental process of recognizing the stimuli we receive. One has to both perceive (recognize) and interpret the sensations one receives before they become perceived messages.

Meera (1995) found that two groups of farmers differed significantly with respect to mean utility perception scores for important agricultural practices.

Sarkar (1995) in his study on participation of rural women in group farming activities in northern states of India opined that utility on the usefulness of agricultural development programs depends on how well the farmers perceive them.

According to Michener *et al.* (2004), social perception refers to constructing an understanding of the social world from the data we get through our senses.

BAU in their Annual Report (2005) on technology interventions of ATMA, reveals that out of four technologies two were perceived as most appropriate by about 50% of the respondents i.e. improved variety of pigeon pea

along with use of bio-fertilizers and improved variety of mustard along with balanced dose of nutrients were rated either as moderately appropriate or inappropriate by majority of the respondents.

Singh and Premlata (2014) in their study on effectiveness of training programmes under ATMA Bihar found that a majority of farmers (58.3 per cent) perceived that they were highly benefitted in terms of 'increase in knowledge' followed by 'gain in skills' (48.3 per cent). It was also found that only 15 per cent of farmers perceived that they would definitely start a new enterprise as a result of training.

2.2.2. Perception about Decentralized Decision Making

Decentralized decision making is any process where the decision making authority is distributed throughout a larger group. It also connotes a higher authority given to the lower level functionaries, executives and workers. In ATMA, one key concept or goal is to decentralize decision making to the district level. ATMA adopts bottom up planning approach to make the technology dissemination farmer driven and farmer accountable thus decentralizing a large and complex national extension system of our country.

Rivera (1997) observed that participatory decision making in extension has shown to increase commitment to programs associated with extension systems.

The impact of decentralization was felt through increased participation in local extension activities. In India, ATMAs were controlled by a Governing Board composed of stakeholders and it received direct input and feedback from Farmer Advisory Committees that were formed in each block (Sharma *et al.*, 2001).

Extension system has changed after the implementation of ATMA scheme throughout India. The new institutional arrangement focused on bottom up approach in planning and decision making. Farmers are now participating in

planning as well as implementation of extension and research strategies at district level. (Reddy *et al.*, 2004).

Decentralization aims to increase the relevance of extension activities, by increasing participation and consultation with local stakeholders. Through bottom-up processes, accountability and ownership of programs to stakeholders and shareholders increases. Decentralization however, requires capacity strengthening of field-level extension workers, who need to gain knowledge and experience in implementing bottom-up program planning procedures. This includes managerial and administrative capacities in addition to technical skills that have been devolved to these levels (Swanson and Rajalahti, 2010).

2.2.3. Perception about Convergence of Line Departments.

In general, convergence is a coming together of two or more distinct entities or phenomena. There are many extension service providers in the field, providing different kinds of useful services like information and service support to farmers. They are state, central government agencies, agribusiness companies, agri-preneurs, input dealers, manufacturing firms, NGOs, farmers organizations and progressive farmers. There is duplication of efforts with multiplicity of agents attending extension work without convergence. There should be coordinated attempt to synergise and converge these efforts at the district and below to improve the performance of various stakeholders. One of the key reforms provided under the ATMA setup includes convergence of line departments such as Department of Agriculture, Animal husbandry, fisheries, dairy etc. in planning and executing farmer centric programmes to get a better outcome.

Sunilkumar (1993) in his study of Linkage between Department of Agriculture and Soil Conservation Programmes in Kerala observed that there was a linkage between officials in the soil conservation unit and the department of

agriculture in the implementation of soil and water conservation programmes but their linkage was only modicum.

2.2.4. Perception about Public- Private Partnership (PPP)

The term public private partnership in the present context is necessarily a collaborative effort between the public and private sectors contributing for one or more functions like planning, resources and activities as required to accomplish a shared goal set out by the partners. The public and private partnership may occur at any one or more stages in the process of extension, production, procurement, processing, marketing etc. depending upon the stated objectives of the partnership.

The ATMA scheme entails a minimum 10 per cent of allocation on recurring activities at district level to be used through the participation of non-governmental sector viz. NGOs, Farmers Organization (FOs), Panchayati Raj Institutions (PRIs), Para-Extension Workers, Agripreneurs, Input Suppliers, Corporate Sector etc.

PPP is also an important strategy in the ATMA extension strategy. Many of the ATMAs have developed PPP especially in the area of linking farmers to markets. For instance, in Patna district of Bihar, Baidyanath Ayurveda Bhawan Ltd. Patna has entered in to agreement with growers to buy-back all the herbs/medicinal supplied by the farmers if they are of good quality. (Singh and Swanson, 2005).

Chandrashekara, *et al.* (2006) observed that the concept of PPP in Agricultural Extension Management was first introduced in Hoshangabad district of Madhya Pradesh during 2001 where the Department of Agriculture, Government of Madhya Pradesh and Dhanuka Group joined together. The National Institute of Agricultural Extension and Management (MANAGE) provided the conceptual framework and facilitated this PPP initiative. The Hoshangabad model has been identified as the first case of PPP in Agricultural

Extension Management and shared on different platforms, which aimed at promotion of Public-Private Partnership in Extension. It provided several lessons on operationalising PPPs in agricultural extension.

Sadamate *et al.* (2008) opined that despite repeated emphasis on collaborative extension efforts involving public and private agencies, this approach is yet to get adequate attention. Some of the critical constraints related to establishment of successful PPPs include bureaucratic hurdles, delay in decision making, hoarding of information/technologies, fear of operational compatibility, lack of a common platform to get into an operational MoU among partners, lack of initiatives and mission mode approach, unwillingness to share credit among partners and reluctance for investments from private players.

Public and private organizations quite often have different agendas, but yet they could come together for mutual gains. The term private in PPP is often understood to stand for the “private corporate sector”. But under PPP, private sector can include a broad range of organizations from corporate sector, private business entities, community based organizations, and voluntary organizations or NGOs. PPP is considered as an important strategy for agricultural development in India and research and extension organizations are currently mandated to initiate specific activities under PPP. PPP is going to be very crucial in the area of agri-processing and marketing and the same can be meaningfully extended to extension services as well (Pandey, 2010).

Maiti *et al.* (2011) reported that Partnership (PPP) linkage, well equipped with know-how and solid infrastructural back up will definitely improve the dairy scenario, thereby helping the cause of dairy development in the country, in general, and the state of West Bengal, in particular.

2.2.5. Perception about Farming System Approach

Farming system refers to a particular arrangement of enterprises (eg. Cropping, livestock keeping, processing farm products) that are managed to

respond to the physical, biological and socio-economic environment and in accordance with the farmer's preferences and resources.

According to Jayanthi *et al.* (1994), In India, the majority of farmers hold less than two hectares of land. These farmers generally practice subsistence farming where they need to produce a continuous, reliable and balanced supply of food as well as cash for basic needs and recurrent farm expenditure. Therefore there is need to develop suitable integrated farming systems for such farmers since single crop production enterprises are subject to a high degree of risk and uncertainty because of seasonal, irregular and uncertain income and employment to the farmers. Sporadic but location specific research efforts in this regard have been encouraging.

Integrated farming system is a mix of farm extension viz., crop, livestock, aquaculture, agro forestry etc. to which a farm family allocates its resources in order to effectively manage and utilize the existing farm environment for attachment of required goals.(Manimekalai, 1997)

The concept of farming system approach can be summarized as it is a holistic approach, complex in nature, inter related components, matrix of soils, plants, animals, power, implements, labour, capital and other inputs influenced by political, economic, institutional and social forces. (Kareem, 2009)

Mishra *et al.* (2011) in their study conducted in Odisha revealed that intensified integrated farming systems make farming profession much more stable, sustainable and profitable benefiting the farming communities in general and resource poor farmers in particular.

2.2.6. Perception about Group Approach

Group approach of extension is a way of disseminating information and technologies on agricultural development through groups of farmers. It aims to develop local skills and empower local people to solve their own problems. Under

ATMA, various farmers' organisations (FOs) are formed like Farmer's Interest Groups (FIGs), Commodity Interest Groups (CIGs) and Self-Help Groups (SHGs) etc.

Sendilkumar (2012) in his study about GALASA carried out in Thrissur district of Kerala found that in the case of participation in group activities and involvement in decision making process, considerable improvement in the mean scores (2.6, 2.7: 3.0, 3.4) has been observed. The principle, philosophy and nature of the GALASA programme itself support the reason for enhancement in the social empowerment.

According to Sulaiman (2012), forming farmer interest groups and federating them at the block and district levels is considered as an important strategy of the ATMA extension approach implemented by the Government. The idea is to encourage farmer groups to organise different types of services for themselves, including input supply, credit, technical services and marketing arrangements-activities that would increase their productivity and income while decreasing their dependence on government.

2.2.7. Perception about Gender and Equity Issues

Gender was recognized as the social characteristic that cuts across caste, class, occupation, age and ethnicity. It is gender that differentiates the roles, responsibilities, resources, constraints and opportunities of women and men in agriculture for which precise gender information is the need of the day.

Gender equity entails the provision of fairness and justice in the distribution of benefits and responsibilities between women and men. The concept recognizes that women and men have different needs and power and that these differences should be identified and addressed in a manner that rectifies the imbalances between the sexes. (MANAGE, 2010)

Sulaiman, *et al.* (2003) noted that the existing approach to help rural women in developing countries achieve food security and income from sustainable agriculture appears to be falling short of expectations. There is a lack of continuity between what is currently being supplied by agricultural extension, advisory programmes, services and what is needed by women who are engaged in the agricultural sector to help them achieve a better livelihood.

Bharathi *et al.* (2008) in their study on impact of National Agricultural Technology Project (NATP) on empowerment of women in agriculture through self help group concluded that there is an appreciable increase in the personality traits and the project has brought many changes in life of rural women by empowering them in almost all the fields i.e. economical, technical and social. It is because of this project, rural women have achieved a lot in their life and have got special recognition in their family, community etc.

There are also many examples of community-based approaches for reaching out to rural women as alternative mechanisms for extension and advisory support for example, Farmer Field Schools (FFSs), cooperatives, farmer organizations, civil society organizations, women's self-help groups and more recently advances in information and communication technologies (ICTs). With regard to this, Najjar *et al.* (2012) call for more research to understand and explore how FFSs can enhance gender equality.

2.2.8. Perception about Farmer Oriented Activities.

Farmer oriented activities in ATMA include mobilization of farmer groups, training, exposure visit of farmers, arranging demonstrations all aimed at empowering farmers and improving their participation in technology dissemination process. (MANAGE, 2010)

Feder (2010) opined that the Farmer Field School (FFS) is a participatory training method that involves a "learning by doing" approach whereby 20–25

farmers, through weekly field observations and analysis supported by a facilitator (an extension agent) test and adapt farming practices to their local conditions. The school runs for a full crop season. Participants in the FFS are selected with community involvement and are expected to contribute to the community after the FFS

Although Dethier and Effenberger (2012) posit that farmer organizations would benefit the poor by helping them reach economies of scale and obtain credit and other services which they would not have been able to achieve individually, there remains little by way of evidence on the long-term impact of these alternative approaches to extension.

Sendilkumar (2012) stated that the mean scores of all the dimensions of empowerment were increased greatly after joining of farmers to the GALASA programme. The major reason for knowledge empowerment was mainly due to their participation in the training programs conducted by various development agencies in the study area.

Organization of training programmes for farmers and other stakeholders is one of the most important activities of ATMA. Singh and Premlata (2014) in their study on effectiveness of training programmes under ATMA reported that majority of farmers (58.3 per cent) perceived that they were highly benefitted from trainings in terms of increase in knowledge followed by gain in skills (48.3 per cent).

Manoj and Vijayaragavan (2014) revealed that the participation of farmers in FFS has helped them in overall knowledge of crop production practices related to integrated nutrient management, seed management and water management.

2.2.9. Perception about Sustainability of Extension Services

In ATMA model it is being mandated that a minimum 10 per cent contribution from beneficiaries should be realized which would help to ensure the financial sustainability of the ATMA and the participating units. (MANAGE, 2010)

Singh and Narain (2008) in their investigation on capacity and willingness of farmers to pay for extension services revealed that about 30 per cent farmers were found having good economic status showing their capacity to pay for extension services. The willingness of farmers to pay for extension services was found depending upon severity and urgency of the problem and also on the possibility of economic returns from a particular service. About fifty per cent farmers agreed that effect of treatment/advice and its economic viability were the major criterion influencing willingness to pay. The thirty nine per cent farmers agreed that a reasonable levy should be charged on certain agricultural products as fee after crop harvesting. Some farmers viewed that this mechanism may not be followed by the farmers of lower economic status. The thirty per cent farmers agreed that the approach might be effective 'cost sharing by group of farmers.

Islam *et al.* (2011) state that tangible economic benefits for a good number of the participant farmers are vital for group sustainability to the extent that even when there is a lack of ready demand for extension information or advice and the service providers are non-cooperative with farmers, collective economic assets such as group funds and their benefits can retain farmers' interests to continue with their group activities. Farmer-led programmes could, therefore, improve their group sustainability prospects by combining advisory or information provisions with tangible economic goods and services for farmers. From this viewpoint, inclusion of group-based microcredit activities along with extension functions could be an option.

Extension reforms through ATMA are based on group approach of extension and aims to make the development process self-reliant and sustainable.

2.2.10. Perception about Farm Information Dissemination

Under the category farm information dissemination, local level agricultural exhibitions, information dissemination through printed materials and development of technology packages in electronic form are covered.

According to Braun and Castello (2006), rural communication is an interactive process in which information, knowledge and skills relevant for development are exchanged between farmers, extension/advisory services, information providers and researchers either personally or through media such as radio, print and more recently the new “Information and Communication Technologies” (ICTs).

The experts around the world have agreed on the fact that the success or failure of any enterprise like farming is not anymore solely dependent on the field conditions but on the availability of the right information at the right time. But there is often a huge gap in the relevance of the available information and its utilization as far as rural India is concerned. Despite the variety of agricultural extension approaches that operate in parallel or sometimes duplicate with one another, majority of farmers in India do not have access to any source of information. This severely limits their ability to increase their productivity. (Glendenning *et al.*, 2010).

2.2.11. Perception about Research- Extension- Farmer Linkage

According to Benor (1987) R-E-F linkage mechanism refers to the mutual and reciprocal connection between research, extension and farmers. Efficient use of resources available to the farmers is achieved through encouraging and facilitating feed back from farmers to researchers through

extension personnel who visit and advice farmers on a regular fixed schedule, thus helping researcher to solve actual production constraints faced by farmers.

According to Hansra (1996) the R-E-F linkage will act as backbone for implementing participatory methodologies at field level. More the interaction among various categories greater will be the agricultural production in our country.

Poor linkages explain the present low adoption of technology and minimal research utilization in agricultural production systems. There is a growing mountain of shelved, perfected yet unutilized research outputs and there are large amounts of information getting tied up in journal publications targeted to peer groups rather than intended beneficiaries. (Smith *et al.*, 2004).

Rathore *et al.* (2008) in their study of research-extension-farmer linkage in the arid zone of India opined that though there was formal mechanism of linkage existing at various levels, the linkage was not so effective in real sense.

2.3. CONCEPT OF IMPACT PARAMETERS OF ATMA

The impact assessment of ATMA is made in terms of comparative improvement in productivity, resilience and connectivity.

2.3.1. Productivity/Production

The concepts and definitions of productivity vary, so do the variety of measurement techniques and opinion as to what is responsible for its increase

AFC (2006) in their final report on ATMA reported that increase in productivity was reported by 18 per cent of sample farmers and the increase was indicated by the maximum respondents in Bareilly (51 per cent) and Aligarh (34 per cent) whereas it was the minimum in Saharanpur (2.4 per cent) and Maharajganj (3.5 per cent) with coefficient of variations of 69 per cent over the districts. The overall wheat yield has increased by about 14 per cent due to

ATMA effect and the probable reason may be increase of area under wheat. Paddy has also recorded increase in yield by 10 per cent over 2005-06.

Singh *et al.* (2009) in his study of impact of ATMA in Bihar observed that adoption of new technologies in project districts resulted in increase in crop yield to the extent of 13 per cent.

2.3.2. Resilience

Resilience is the capacity of a system to survive, adapt and grow in the face of unforeseen changes. Agriculture resilience is about equipping farmers to absorb and recover from shocks and stresses to their agricultural production and livelihoods. There are three pillars of resilience: financial, social and environmental. The ultimate aim of ATMA is to provide economic emancipation to the farming community. ATMA proposes sustainable and diversified farming, on-farm and off-farm livelihoods, allowing the farmers to face production and marketing risks without falling back into poverty and distress. In ATMA, farmers are mobilized into CIGs, FIGs, FOs etc. to enhance production, productivity and profitability. These farmers are given hand holding support at every stage and provided access to modern technology through community based processes including farm schools. Their capacities are strengthened through federated groups and they will be facilitated to access forward linkages with regard to technology for enhanced productivity, value addition of feasible products and market tie-ups. These federated ATMA groups enjoy improved input and output market access as well as negotiating power.

2.3.3. Connectivity

The extent of interaction among farmers, between farmers and officers, between ATMA groups, researchers and extension officers, farmers and market will give an insight into the strengthened connectivity in ATMA. ATMA provides more opportunities for wider interaction among farmers through group approaches. Regular R-E-F interfaces and farmer oriented activities also ensure

the same. Also the officials of various line departments, experts from KVKs and other scientists from agriculture universities or research institutions providing farm advisory services, new technology dissemination and redressal of grievances of farmers through regular visits to their farm fields. All these interactions increases availability of improved technologies, quality advice on crop management practices and market information to farmers.

2.4. PROFILE CHARACTERISTICS OF STAKEHOLDERS

2.4.1. Profile Characteristics of Farmers.

2.4.1.1 Age

Nath (2002) reported that age had negative and significant correlation with the functioning of *thozhil sena* (labour bank).

Sridhar (2002) in his study on watershed programme found that 44.67 percent of the respondents were middle aged, while, 28.00 percent of them were young and remaining 27.33 per cent belong to old aged.

Thiyagu (2011) in his study on “impact analysis of System of Rice Intensification (SRI) among the paddy farmers of Coimbatore district” reported that majority of the respondents (49.2 per cent) were found in the young age category followed by 27.5 per cent in the middle age category, and only 23.3 per cent fell under old age category.

2.4.1.2. Annual Income

Kaur *et al.* (2006) in their study of ATMA in Gurudaspur district of Punjab revealed that consequent upon the project activities under ATMA, the farm household income both in the case of farm and non-farm sources increased on all the farm situations. This increase was 10.62 per cent. On an overall basis, the farm income increase was 5.25 per cent whereas in case of non-farm income it

was 21.26 per cent. Category wise, medium farmers recorded maximum percentage increase i.e. 6.87 and 27.91 both in the case of farm and non farm income respectively.

Kumar and Jagadeeswary (2007) in their study on “correlates of small farmers opinion on privatization of veterinary services” indicated that 43.33 per cent of the respondents belonged to medium level income group followed by 37.78 per cent and 18.89 per cent with low and high income groups respectively.

Rathod *et al.* (2014) in their study on “farmers perception towards livestock health care service delivery by dairy cooperatives” conducted in western Maharashtra pointed out that 69.34 per cent respondents were under medium income category followed by low and higher annual income category.

2.4.1.3. Educational Status

Sridhar (2002) conducted an evaluative study of watershed programme in Pavagada taluk of Tumkur district in Karnataka and found that 26.67 per cent of the respondents were educated up to high school, 24.66 per cent up to middle school, 12.67 per cent up to primary school, 12.00 per cent could read, write and 11.33 per cent had collegiate education. The percentage of illiterates was 12.67.

Reddy (2005) in his study on ‘knowledge, extent of participation and benefits derived by participant farmers of the watershed development programme in Raichur district of Karnataka state’ reported that 30.00 per cent of the respondents had education up to high school, followed by middle school (28.00 per cent) and primary school (27.33 per cent). Nearly 12.00 per cent of them were illiterates, while a meagre 4 per cent of them had education up to college and degree programme.

Gupta *et al.* (2010) in their study on extent of participation of beneficiaries in the different micro-agro eco systems of Ghorbae watershed area in Shahdol

district, Madhya Pradesh found out that level of participation increased with the level of education and was significantly associated.

2.4.1.4. Farm Size

Chinchu (2011) stated that majority (55 per cent) of the farmers had 1-2 acres of land while 35 per cent of the farmers had less than 1 acre of farm size and only 10 per cent had more than 2 acres of farm size.

Rathod *et al.* (2014) in their study ‘farmers perception towards livestock health care service delivery by dairy cooperatives: A case study of Western Maharashtra’ indicated that 76.67 per cent respondents were medium farmers followed by small and larger farmers.

2.4.1.5. Economic Motivation

Bhavya (2008) in her study on ‘cause-consequence indebtedness among farmers in Pulpally panchayat of Wayanad district reported that 60.00 per cent of respondents had medium level of economic motivation followed by high (21.67 per cent) level of economic motivation. The more one is motivated by economic ends, the more he or she will try to adapt to practices which are aimed at increasing sustainable returns.

Sangeetha (2009) in her study on ‘factors influencing the adoption of precision farming technologies in tomato cultivation’ revealed that 58.18 per cent of the respondents had higher level economic motivation followed by 30.91 per cent medium and 10.91 per cent low level of economic motivation

2.4.1.6. Farming Experience

Fayas (2003) conducted a study on ‘viability of self help groups in Vegetable and Fruit Promotion Council Keralam’ reported that about 75 per cent of the farmers had more than 20 years experience in cultivation.

Rakesh (2010) in his study on precision farming in sugarcane reported that 42.70 per cent of the respondents had experience of up to 2 years and more than 2 years in precision farming. The low level of experience was observed by 15.30 per cent of the respondents who had experience up to 1 year.

Thiyagu (2011) reported that majority of the SRI farmers (46.70 per cent) had medium level of farming experience, followed by 30.80 per cent with low level of farming experience and the remaining 22.50 per cent of the farmers had high level of farming experience

2.4.1.7. Innovativeness

Jaganathan (2004) in his study on ‘analysis of organic farming practices in vegetable cultivation in Thiruvananthapuram district’ observed that more than half of the respondents (55 per cent) had medium innovativeness and also found that innovativeness had a positive and significant relationship with extent of awareness, extent of knowledge and attitude of respondents.

Nath (2004) in his study on ‘extension strategies for the major farming systems in the context of the changing agricultural situation in Kerala’ found that no significant difference in the mean scores among the farming systems with regard to innovation proneness of farmers in NARP zones.

Chinchu (2011) in his study on ‘performance effectiveness of State Horticultural Mission Kerala’ reported that more than half (58 per cent) of the beneficiary farmers of State Horticulture Mission- Kerala were innovative in nature and also were good adopters of improved agricultural practices.

2.4.1.8. Risk Orientation

Jaganathan (2004) observed that nearly three fourth of the respondents (73 per cent) had medium level of risk orientation and it had positive and significant relationship with knowledge of the farmers about organic farming practices.

Kumar and Jagadeeswary (2007) concluded that 45.56 per cent of the respondents had low level of risk orientation followed by medium (37.78 per cent) and high (16.66 per cent) levels.

Somanath (2009) in her study on 'Entrepreneurial effectiveness of agripreneurs in Kerala' has stated that the agripreneurs of the state in general were moderate risk takers.

2.4.1.9. Extension Contact

Himaja (2001) in her study on the 'entrepreneurial behaviour of self-help group women of SGSRY in Nellore district of Andhra Pradesh' reported that majority of the respondents had medium level of extension contact followed by low (20.00 per cent) and high (16.67 per cent) levels of contact.

Reddy (2003) in his study on 'entrepreneurial behaviour of sericulture farmers in Chittoor district of Andhra Pradesh' reported that majority (60.00 per cent) of the respondents were having medium level of extension contact followed by low (24.67 per cent) and high (15.33 per cent) levels of extension contact respectively.

Chavan *et al.* (2010) in their study on 'effectiveness of agricultural programmes perceived by televiewing farmers' had reported that extension contact had significant correlation with the perceived effectiveness of agricultural programmes.

2.4.1.10. Extension Participation.

Anitha (2004) in her study on 'entrepreneurial behaviour and market participation of farm women in Bangalore rural district of Karnataka' reported that 17.50 per cent of respondents had high extension participation, 44.20 per cent had medium and 38.30 per cent had low extension participation.

Mallikarjuna *et al.* (2012) in their study on Farmer's Field School (FFS) among sericulturists in Karnataka, Andhra Pradesh and Tamil Nadu, stated that the whole exercise of FFS has developed group and participatory approach, apart from increased adoption level. The cocoon yield level of cross breed and bivoltine hybrids were improved after successful demonstration.

Manoj *et al.* (2014) in their investigation on 'impact of Farmers' Field School on farmer's knowledge of integrated crop management practices in paddy' revealed that the participation of farmers in Farmer Field Schools has helped them in improving overall knowledge of crop production practices related to integrated nutrient management, seed management and water management. Significant level of gain in knowledge also occurred in all the components of IPM practices such as cultural control measures, mechanical control measures, biological control measures and chemical control measures.

2.4.1.11. Number of Trainings Undergone

Ashaletha (2000) in her study on 'impact of NARP on agricultural development in the southern agro climatic zone of Kerala' revealed that training was positively and significantly related to the awareness about the NARP.

Parthasarathi and Govind (2002) in their study about knowledge of trained and untrained farmers on IPM practices reported that the knowledge level of trained farmers was much higher on biological and physical methods of IPM, identification of pests and predators on economic threshold levels. This shows that the training on IPM had positive effect on farmers.

Singh and Premlata (2014) in their study of 'effectiveness of training programmes under ATMA in Bihar' calculated the overall training effectiveness based on individual score and it was found to be 54.6 per cent which implies that trainings conducted under SREP-ATMA implementation were successful to some extent only and were rated as average. This suggests a need to enhance the

effectiveness of capacity building programmes since a lot of money is spent on organizing training programmes for farmers. Capacity building is a core area in extension education and it needs attention during implementation of ATMA programmes.

2.4.1.12. Mass Media Exposure

Mishra *et al.* (2012) in their study on 'purpose and media utilization pattern of ATMA farmers in Bihar' revealed that mass media like TV, radio and newspaper were used for the purpose of news/information by the majority of the respondents. Magazine was used for the purpose of news/information and education by the majority of the respondents.. Mass media like TV, radio, newspaper and magazines were available and used by the major chunk of the farmers.

According to Deshpande *et al.* (2013), mass media exposure played important role in determining the awareness as well as role performance of Grampanchayat members about agricultural development programmes.

2.4.2 Profile Characteristics of Implementing Officers.

2.4.2.1 Number of Trainings Undergone by the Officers as a part of ATMA

Barman and Kumar (2012) studied knowledge level of extension personnel under ATMA regarding their facilitation skills, opined that due attention should be given on developing facilitation skills of extension personnel to get desired results from ATMA. Special in service training should also be organized for extension personnel to develop facilitation skills.

2.4.2.2. Job Satisfaction

Mishra (2005) conducted a comparative study on the job performance, job satisfaction and constraints of men and women extension officers of Karnataka

state department of agriculture, reported that 13.11 per cent of extension officers exhibited high level of overall job satisfaction, 20 per cent low level of job satisfaction and majority (64.2 per cent) of the extension officers belonged to medium level of job satisfaction.

Mishra *et al.* (2011) in their study on 'Integrated Farming System Approaches for Sustainable Livelihood of Small and Marginal Farmers in Odisha, opined that a favourable climate perception results in higher efficiency or productivity of the employees there by result in their higher job satisfaction. It is because extension workers have clear mental picture about the climate of the organization especially with respect to human relations, supervision and guidance, communication, programme planning, decision-making etc.

Nath and Saravanan (2014) revealed in their study on 'job satisfaction and job autonomy of extension personnel of the public agricultural extension organization in Tripura state of north-east India' that there was significant relationship between agricultural officer's job satisfaction and organizational commitment, guidance and supervision, facilities and resources and problems.

2.4.3. Frequency of Participation of Members of Decision Making Authorities in ATMA Meetings.

ATMA has two organs viz. GB and AMC which are the policy making and advisory bodies. These decision making authorities consists of all the stakeholder representatives of ATMA. Besides, at the block level, FAC operates. The FAC is composed entirely of farmers who represent different socio-economic categories of farmers within the block. FACs have become an integral part of the formal feedback mechanism between farmers and the heads of the research and extension programs within the district. So, the extent of participation of the members will influence the organizational functioning of these decision making authorities which also decide their perception towards ATMA.

An Assessment of role effectiveness of FAC and organizational functioning of 'ATMA' Project in Gurdaspur district of Punjab conducted by Kaur and Gupta (2007) revealed that average attendance in FAC meetings which was below expectations, i.e only 62 per cent.

2.4.4. Extent of Participation of NGOs and Private Partners in ATMA Activities.

An important element in ATMA model is the involvement of voluntary sector including NGOs and input dealers in decentralized decision-making, planning and priority-setting of extension activities.

2.5. CONSTRAINT

Kumar *et al.* (2011) in their study of Constraints faced by stakeholders in implementation of ATMA, listed the important constraints expressed by the extension functionaries involved in ATMA as, too many schemes and vacancies, less demonstrations on existing farming systems in the district and lack of technological training on different farming systems pertaining to agriculture and allied departments.

Singh and Premlata (2014) reported that non cooperation from block level administration, shortage of ATMA staff, lack of awareness about SREP among farmers and lack of marketing support as the most important constraints in implementation of SREP.

MATERIALS and METHODS

3. MATERIALS AND METHODS

This chapter describes the research methods and techniques adopted in conducting the present research study. The methodological details used were given under the following section heads.

3.1. Locale of the Study

3.2. Selection of Respondents

3.3. Research Design

3.4. Operationalization and Measurement of Dependent Variable.

3.5. Impact Parameters of ATMA

3.6. Selection, Operationalization and Measurement of Profile Characteristics of Respondents

3.6.1 Profile Characteristics of the Farmers

3.6.2 Profile Characteristics of the Officers

3.6.3 Participation of the Members of Decision Making Authorities in ATMA meetings

3.6.4 Extent of participation of NGOs and Private Partners in ATMA meetings/activities

3.7. Constraints Perceived by the Stakeholders

3.8. Suggestions Offered by Stakeholders

3.9. Techniques of Data Collection

3.10. Statistical Tools Used for the Study.

3.1. LOCALE OF THE STUDY.

Thiruvananthapuram district was selected as one of the locales for the study as the district was included in initial phase of establishment of ATMA in Kerala. Besides, SAMETI which provides the capacity building to ATMA is also located in this district. Kottayam district was the other locale for the study wherein ATMA was established in the second phase and it was also found through field level experiences that Kottayam ATMA activities were carried out extremely well.

3.2. SELECTION OF RESPONDENTS

The respondents for the study were selected through a three stage random sampling design with district as the first stage, block at second stage and gramapanchayat as the third stage for the study purpose.

Since the study is participatory with multi-stakeholder involvement, the following classes of stakeholders of ATMA were chosen as respondents. Altogether a total of 200 respondents 100 from each district were selected for the study as follows:

1. Implementing officials from the line departments of each district such as the Department of Agriculture, Animal Husbandry, Dairy Department and Fisheries at the District, selected block and gramapanchayat levels. Thirty respondents were included totally from these three levels using proportional allocation method.
2. Members of the ATMA Governing Body, ATMA Management Committee and selected Farmers Advisory Committee from each district representing the farmers. Totally thirty respondents were included from these three bodies using proportional allocation method.
3. Respondents to represent the other beneficiary groups- Thirty respondents were totally included from the selected Farmers Organizations/Farmer Interest Groups/Commodity Interest Groups using proportional allocation method.

4. Respondents to represent the NGOs and Private partners –Ten respondents were randomly selected from the identified NGOs and Private partners.

3.2.1 Selection of Blocks and Gramapanchayats

This research was undertaken in Thiruvananthapuram and Kottayam districts of Kerala. Two blocks from each district were selected through random sampling technique. From each of the selected blocks, one panchayat was randomly selected.

Table 2. Selected blocks in Thiruvananthapuram district

District	Name of the blocks	Selected block and respective panchayat
Thiruvananthapuram	Parassala, Athiyannoor Perumkadavila, Nemom Thiruvananthapuram Rural, Kazhakoottam, Nedumangad, Vellanad Vamanapuram, Chirayinkizhu Kilimanoor, Varkala	1)Kazhakoottam block- Kazhakoottam (panchayat) 2)Nedumangad-Panaoor (panchayat)

Table 3. Selected blocks in Kottayam district

District	Name of blocks	Selected block and respective panchayat
Kottayam	Erattupetta, Ettumanoor Kaduthuruthy, Kanjirappally Lalam, Madappally, Pallom Pampady, Uzhavoor Vaikom, Vazhoor	1)Kanjirappalli block- Kanjirappalli (panchayat) 2)Pampady- Kooroppada (panchayat)

Table 4. Selection of respondents

Sl. No.	Category of respondents	Selection procedure	No. of respondents /district
1	Implementing officials	<ul style="list-style-type: none"> • 5 District level officers of ATMA (2 nos from Dept. of Agriculture, 1 no. each from Animal Husbandry, Dairy and Fisheries Departments) • 5 Officers each from selected blocks. (Representation from all the four Depts. Total 10) • 7 or 8 Officers from selected panchayats. Total 15. (Representation from all the four Depts. Majority officers from Dept. of Agriculture) 	30
2	Members of the decision making authorities.	<ul style="list-style-type: none"> • 15 members randomly selected from GB/ AMC. • 15 members randomly selected from members of FAC of selected blocks. 	30
3	Farmers	15 Nos. each from selected panchayats of two blocks.	30
4	NGO and private partners.	Ten respondents were randomly selected from the identified NGOs and Private partners	10
Total no. of respondents (for both districts)			100+100 =200

3.3 RESEARCH DESIGN

Ex post facto design was employed in the present study. *Ex post facto* research design is a systematic inquiry in which the scientist does not have direct control over the independent variables because their manifestations have already occurred or because they are inherently not manipulable (Kerlinger, 1983). This research design was resorted to in this study, as there was no scope for manipulation of any variables under study.

3.4. OPERATIONALISATION AND MEASUREMENT OF DEPENDENT VARIABLE

3.4.1. Operationalisation of Dependent Variable

The dependent variable in the study is perception about implementation of revitalized ATMA activities. Comparison of ATMA activities of the two districts were carried out in terms of perception towards following ten parameters of revitalized ATMA. In the study perception is operationally defined as the meaningful sensation of the respondent about the revitalized ATMA activities.

3.4.1.1. Decentralized Decision Making

In this study decentralized decision is defined as shifting decision making rights or responsibilities away from the centre from a smaller to a larger number of actors. ATMA approach focused on bottom up planning and decision making through increased participation and consultation with local stakeholders.

3.4.1.2. Convergence of Line Departments.

Convergence of line departments in ATMA is another key reform which was assessed as the coordination and synergy of departments such as Agriculture, Animal husbandry, Fisheries and Dairy in planning and executing farmer centric programmes.

3.4.1.3. Public-Private Partnership.

Public- Private- Partnership is also an important extension strategy in ATMA which was conceptualised as the participation of NGOs and private players in planning, implementation and providing service to farmers.

3.4.1.4. Farming System Approach.

ATMA concentrates on farming system approach which promotes integrated farming system models, a mix of several enterprises such as cropping, livestock keeping, fisheries etc. to which a farm family allocates its resources in order to effectively manage and utilize the existing farm environment which can make farming profession much more stable, sustainable and profitable.

3.4.1.5. Group Approach through FOs /FIGs/CIGs.

ATMAs are envisaged as a very effective instrument for promoting participatory planning and group-based approaches with focus on learning and empowerment. It was envisaged that the ATMA body will take efforts to promote groups of farmers and organize them around specific crops or commodities.

3.4.1.6. Gender and Equity Issues.

ATMA addressing specific consequences of the inequality of women and men and making provision of fairness and justice in the distribution of benefits and responsibilities between women and men. In ATMA, women and men participate as equals, have equal access to resources, and equal opportunities to exercise control.

3.4.1.7. Farmer Oriented Activities.

Farmer Oriented Activities in ATMA include Strategic Research Extension Plan (SREP) preparation, mobilization of farmer groups, training/exposure visit of farmers, farm schools, arranging demonstrations, all aimed at empowering farmers and enhancing their participation in technology dissemination processes.

3.4.1.8. Sustainability of Extension Services

It refers to ensuring beneficiary contribution which will help to run the extension system and services itself and make the farmers independent.

3.4.1.9. Farm Information Dissemination.

Under the category of Farm Information Dissemination, local level agricultural exhibitions, information dissemination through printed materials and development of technology packages in electronic form are covered.

3.4.1.10. Research-Extension-Farmer linkage.

The integration of research, extension, farmer linkages is an important agenda under ATMA. R-E-F linkages based activities in ATMA include organization of Farmer-Scientist-Extension personnel interaction at local level, field visits for the benefit of the farming community.

3.4.2. Measurement of Perception of Implementation of ATMA

Perception of different respondent categories was measured using the scale developed for the study. Items by which perception of implementation of ATMA measured was included through reviewing literature and discussion with the experts associated with the ATMA programmes. The schedule consists of ten statements on each dimension of ATMA and were administered to the respondents and responses were obtained in four point continuum consisting of 'excellent', 'good', 'moderate' and 'poor' with scores of 4, 3, 2 and 1 respectively. The perception mean score of each dimension of ATMA for a respondent category was found out by dividing the cumulative score obtained for the particular dimension in that category with the total number of respondents in that category. The sum of the scores of ten statements representing ten dimensions constitutes the total perception score of a respondent.

3.5. IMPACT PARAMETERS OF ATMA

3.5.1. Productivity

A conventional productivity index is a measure of the quantity of outputs divided by a measure of the quantity of inputs. The most widely used productivity measure express a single output per unit of a particular input such as land. Farmers were asked whether the yield of the crop has increased or not. The productivity was measured in terms of percentage increase in yield for major crops owned by the farmer. The scoring procedure followed is given below. The procedure adopted by Nath (2004) was followed in this study with slight modification. This was measured in terms of percentage increase in yield of major crops from the field of farmer respondent after exposure to ATMA. Farmers were asked the crop yield before exposure to ATMA and after ATMA interventions. Based on that yield increase was worked out. The scoring procedure followed is given below.

Yield increase	Score
More than 76 per cent	4
51 to 75 per cent increase	3
26-50 per cent increase	2
Less than 25 per cent increase	1
Nil	0

3.5.2. Connectivity

Connectivity was operationalized for the study as the extent of contact between different stakeholders of ATMA and also farmer to farmer and farmer to market interactions. The perceived increase in connectivity due to ATMA as reported by the respondents has been taken as such in the study. The scoring given was as follows:

Sl.No.	Category	Good (3)	Moderate(2)	Bad(1)
1	Farmer-official			
2	Farmer-market			
3	Extension officer-scientist			
4	Among members of ATMA group			
5	Between ATMA group			

3.5.3 Resilience

Resilience refers to the ability of the farmer and related systems to maintain equilibrium or adapt to the internal and external changes. Resilience was measured in terms of three components introduced at their farm which were identified through review of literature and discussion with experts. Availing these strategies help the farmer to gain sustainable income and have the buffer to disturbances. The responses were obtained by directly asking the respondent the components adopted after ATMA interventions. The schedule developed for the study consists of three items and the response were obtained as Yes or No which carried a score of 1 for 'yes' and 0 score for 'no'. The summation of the score of all items formed the score of the resilience of a farmer respondent.

Sl No.	Components
1	Multiple cropping
2	Integrated farming
3	Value addition

3.6. SELECTION, OPERATIONALIZATION AND MEASUREMENT OF PROFILE CHARACTERISTICS OF RESPONDENTS

The value of the report largely depends on different variables taken into consideration for the study. The critical analysis, meaningful interpretation and

conclusion can be brought out only when justifiable variables are selected and appropriate measurement of the variables has been followed.

In order to assess the influence of the profile characteristics of the respondents for meeting the objectives of the study, the characteristics of the respondents were identified as detailed below:

A list of independent variables related to the personal characteristics of the stakeholders of ATMA which are important to meet the objectives of the study were collected after detailed review of literature and discussion with experts. The lists of variables were then sent to 30 judges. They were asked to examine the variables critically and to rate the relevancy of each variable on a three-point continuum ranging from most relevant, relevant and least relevant with weightages of three, two and one respectively. After the judges rating, the cumulative score for each variable was calculated and a cut off score of 67.5 (75% of total score) was fixed to select the variables. The profile characteristics of the respondents thus selected are shown below.

a) Profile Characteristics of Farmer respondents

1. Age
2. Annual Income
3. Educational Status
4. Farm Size
5. Economic Motivation
6. Farming Experience
7. Innovativeness
8. Risk Orientation
9. Extension Contact
10. Extension Participation
11. Number of Trainings Undergone as a part of ATMA
12. Mass Media Exposure

b) Profile Characteristics of the Implementing Officers

- 1) Number of Trainings Undergone as a part of ATMA
- 2) Job Satisfaction

c) Frequency of Participation of the Members of Decision Making Authorities in ATMA Meetings

d) Extent of Participation of NGOs and Private Partners in ATMA Activities

3.6.1 Profile Characteristics of Farmers

3.6.1.1. Age

It was operationalized as the actual age of the respondents in completed years at the time of interview. The respondents were classified into three categories namely young, middle and old based on the Census report (2011) of Government of India which was later adopted by Sobha (2013).

Category	Age	Score
Young	Less than 35 years	1
Middle	36-55 years	2
Old	Above 55 years	3

3.6.1.2. Annual Income

It is referred as the total earning of all the members of the family of the respondents for a period of one year under study (2013-14). This was obtained by directly asking the respondent the income of his family for one year and scored as follows:

Income (Rs.)	Score
≤ 10,000	1
10,001 to 25,000	2
25,001 to 50,000	3
50,001 to 1,00,000	4
More than 1,00,000	5

3.6.1.3. Educational Status

Educational status is defined as the level of formal education attained by the respondents at the time of interview. The scoring procedure developed by Singh (1993) was followed by Hanjabam (2013) is adopted here.

Category	Score
Illiterate	1
Write and read	2
Primary	3
High school	4
Higher secondary	5
College	6

3.6.1.4. Farm Size

It had been referred as the total extent of land under cultivation by an individual farmer at the time of enquiry. The respondents were classified into four categories and scores were allotted to them as per the scoring procedure developed by Sreedaya (2000) and followed by Sobha (2013).

Area in acres	Score
<0.5	1
0.51-1	2
1.01-2	3
>2	4

3.6.1.5. Economic Motivation

Refers to the extent to which a farmer is oriented towards profit maximization and relative value he places on monetary gains.

The scale developed by Supe (1969) and followed by Esakkimuthu (2012) was used to measure economic motivation. The scale consisted of three statements. Each statement was provided with five point response categories namely Strongly agree, Agree, undecided, Disagree and Strongly Disagree, with scores of 5, 4,3,2 and 1. The summation of the scores of all the three statements formed the score for economic motivation.

3.6.1.6. Farming Experience

Farming experience refers to the total number of years the respondent has been engaged in farming. Scoring procedure developed by Sreedaya (2000) and followed by Sobha (2013) was adopted for measuring farming experience. The scoring pattern was as follows

Experience in years	Score
>5	1
6-10	2
11-25	3
>25	4

3.6.1.7. Innovativeness

It refers to the degree to which the respondent was relatively earlier in adopting new ideas.

The procedure developed by Singh (1977) and followed by Esakkimuthu (2012) was used to measure innovativeness in this study. The scale consisted of positive and negative statements. The sum of the scores of each statement was the score for risk orientation of the respondent. The scoring procedure is as follows.

Nature of statement	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Positive statement	5	4	3	2	1
Negative statement	1	2	3	4	5

3.6.1.8. Risk Orientation

Risk orientation has been referred as the degree to which the farmer was oriented towards encountering risks and uncertainty in adopting new ideas in farming. It was measured by applying the risk orientation scale developed by Supe (1969) and followed by Sobha (2013). The scale consisted of six statements of which the fifth statement was negative. The sum of the scores of each statement was the score for risk orientation of the respondent. The scoring procedure is as follows.

Nature of statement	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
Positive statement	5	4	3	2	1
Negative statement	1	2	3	4	5

3.6.1.9. Extension Contact

It was operationalized as the degree of contact of respondents with various ATMA officials for acquiring information on farming and allied activities. It was measured using the procedure developed by researcher for the study. The quantification of this variable was done based on the regularity of contact with extension agents.

Sl No.	Category	Regularly(3)	Occasionally(2)	Never (1)
1	Field Assistant			
2	Agricultural Assistant			
3	Agricultural Officer			
4	Block Technology Manager			
5	Assistant Director of Agriculture			
6	Project Director ATMA			

3.6.1.10. Extension Participation

It was operationalized based on the farmer's participation in extension activities especially the ATMA cafeteria programmes. The score obtained for each of the items were summated to get the score of extension participation. The scoring procedure developed for the study are described below.

Sl No.	Frequency of participation	Scores
1	Regularly	3
2	Occasionally	2
3	Never	1

3.6.1.11. Number of Trainings Undergone as part of ATMA

Trainings in this study was operationalized as the number of trainings in agriculture and related fields received by the respondents for the period 2013-14. The scoring pattern developed for the study is as given below:

Sl No.	Frequency of participation	Scores
1	1 to 3	1
2	4 to 6	2
3	>6	3

3.6.1.12. Mass Media Exposure

Mass media participation refers to the extent to which farmer is exposed to different mass media channels. This will be measured using the procedure developed by Prasadha (2006) and followed by Prabhu (2011). The scores for frequency of use of the sources for seeking information were ranging from 3 to 1 for frequently, occasionally and rarely in the order of sequence.

3.6.2. Profile Characteristics of the Implementing Officers

3.6.2.1. No. of Trainings Undergone by the Implementing Officers as part of ATMA

Training here refers as the number of trainings in agriculture and related fields received by the respondent in the last one year. The scoring pattern developed for the study is as follows:

Sl No.	Frequency of participation	Scores
1	1 to 3	1
2	4 to 6	2
3	>6	3

3.6.2.2. Job Satisfaction

Job satisfaction was operationalized as the degree to which the extension personnel were satisfied or dissatisfied with different aspect of their jobs. This was measured using a scale developed by Sridhar (1977) and followed by Nath (2004). The responses of the subjects were collected over three point rating scale namely very much satisfied, satisfied and dissatisfied with score of 3, 2 and 1 respectively. There are 11 items in the instrument. Thus the minimum and maximum scores for each respondent were 11 and 33 respectively. The maximum score would reveal the greater job satisfaction by the respondent.

3.6.3. Frequency of Participation of the Members of Decision Making Bodies in ATMA Meetings

It was operationalized in terms of frequency of participation of the respondent in the meetings of ATMA. The quantification of this variable was done based on the regularity of participation in their respective bodies. The scoring pattern developed for the study is as follows.

SI no.	Frequency of participation	Scores
1	Regularly	3
2	Occasionally	2
3	Never	1

3.6.4. The extent of participation of the NGOs and private partners in ATMA Activities

It was operationalized in terms of participation of the institution in the decision making bodies and in the different platforms of ATMA. The scores for frequency of participation ranging from 3 to 1 for frequently, occasionally and rarely in the order of sequence.

3.7. CONSTRAINTS PERCEIVED BY THE STAKEHOLDERS

One of the main outcome of the study was to identify the constraints perceived by the stakeholders while engaging in ATMA activities. In the present study constraint was operationalized as difficulties or problems faced by the stakeholders which hinders the successful implementation of the programme and avail the benefits. Based on the review of literature and discussion with experts and beneficiaries of ATMA in non sampling area, a list of possible constraints while implementing ATMA were identified and presented in the interview schedule as simple and clear statements. The four categories of respondents were asked to respond to a three point continuum as most important, important and less important with scores for different stakeholders. The procedure used for ranking constraints is as follows.

The response of each constraint was obtained on a three point continuum viz., 'most important', 'important' and least important with score of 3, 2 and 1 respectively. For each constraint, the total score was worked out and assigned ranks.

3.8. SUGGESTIONS BY THE RESPONDENTS TO IMPROVE ATMA

A list of possible suggestions prepared based on the review of literature and discussion with experts and beneficiaries of ATMA in non sampling area. This was administered to the four categories of respondents. The respondents were asked to give their responses in a three point continuum as 'most important', 'important' and 'less important' with score of 3, 2 and 1 respectively. Total score of each suggestion was worked out for the four categories of respondents separately and assigned ranks.

3.9. TECHNIQUES OF DATA COLLECTION

The preliminary survey conducted by the researcher gave the first hand information about the aspects to be studied and pattern of questions to be included. The interview schedule was prepared in conformity with the objectives of the study. The data was collected using the pre tested interview schedule developed for the study. The interview schedule prepared in English was translated into Malayalam before administering to the respondents except implementing officers.

All the 200 respondents were directly interviewed by the researcher. Questions were asked in a conventional style and responses were transcribed in the schedule itself.

3.10. STATISTICAL TOOLS USED FOR THE STUDY

The following statistical methods were employed in the analysis and interpretation of the data.

1) **Categorization**

Categorization of each independent variables was done by calculating the frequency percentage of the total score obtained by the respondent in each category. Respondents were classified into low, medium and high group taking mean and standard deviation as criteria.

2) **Percentage analysis.**

Percentage was used for finding out the distribution of the respondents and for easy comparison.

3) **Simple correlation analysis:**

Simple correlation analysis was done to measure the relationship between the dependent variables and independent variables.

4) Spearman's rank order correlation

Spearman's rank order correlation was used in the present study to measure the degree of agreement among the farmers in their ranking of constraints and suggestions.

5) Mann-Whitney U Test

Mann-Whitney U Test is a non-parametric test that was used in the study to compare two population means relating to qualitative characters.

RESULTS and DISCUSSIONS

4. RESULTS AND DISCUSSION

This chapter highlights the findings of the investigation. The findings along with discussion are given under the following sections in the light of the objectives set forth:

4.1. Comparing the Implementation of Revitalized ATMA in Thiruvananthapuram and Kottayam Districts

4.2. Perceived Impact of ATMA in both the Districts

4.3. Profile Characteristics of the Respondents

4.4. Correlation of Profile Characteristics of Farmers with Perception of Implementation of ATMA Activities

4.5. Constraints Perceived and Suggestions Offered by Stakeholders.

4.6 Suggestions for streamlining of ATMA

4.1. COMPARING THE IMPLEMENTATION OF REVITALIZED ATMA IN THIRUVANANTHAPURAM AND KOTTAYAM DISTRICTS.

Comparison of ATMA implementation in Thiruvananthapuram and Kottayam districts was done with respect to implementation of ten key parameters of ATMA. The significance of difference of each component between two districts were found out separately for the different categories of respondents using Mann Whitney U test. The perception scores range from 1 to 4.

4.1.1. Comparison of Implementation of ATMA in terms of Perception about Decentralised Decision Making by the Stakeholders

The results in Table 5 reveal that the perception mean score of all the four categories of respondents of Kottayam district was positive and higher when

compared to that of Thiruvananthapuram with respect to decentralised decision making and it was statistically significant.

Table 5. Perception mean score of respondents about decentralized decision making

Respondents	Perception	Mean score	P value
	Ktm (n=100)	Tvm (n=100)	
Farmers	3.07	1.96	< 0.01**
Officials	3.36	2.33	< 0.01**
Members of the decision making bodies	3.43	3.06	< 0.01**
NGOs and private players	3.00	2.4	0.04*

Decentralised decision making has been perceived 'good' in Kottayam district may be because of the fact that the farmers have participated in a decentralised way in giving shape to SREP as a part of ATMA Kottayam. From the initial stage onwards there was active participation from all the stakeholders such as farmers, officers, members of the decision making authorities and the NGOs and private partners. SREP was prepared based on agro ecological situations which addressed issues from representative blocks and gramapanchayats where the farmers had also given their inputs, thereby it has become more specific and demand driven. Naturally, the respondent farmers who either participated in the process or had the knowledge that their friends who have participated perceived that decentralised decision making was there in letter and spirit in the case of Kottayam right from the formative stage of SREP. Also the farmer representatives were chosen from the different three agro ecological

situations and therefore it is natural that the participating farmers and their neighbours had an appreciation that ATMA is participatory and works in a decentralised way. When the thesis was conceived there was considerable difference in the implementation of ATMA in these districts. But now, Thiruvananthapuram ATMA was able to narrow down the difference. The same is applicable in the case of all the other three categories of respondents.

Lenin *et al* (2009) reported that farmers had to be included as members of the team which prepares SREP and BAP and their decision making had to be raised to the level of controlling ATMA.

4.1.2. Comparison of Implementation of ATMA in terms of Convergence of Line Departments by the Stakeholders

Table 6 unfolds that there is considerable difference between Thiruvananthapuram and Kottayam districts with reference to perception about convergence of line departments.

Table 6. Perception mean score of respondents about convergence of line departments

Respondents	Perception Mean score (n=200)		P value
	Ktm (n=100)	Tvm(n=100)	
Farmers	2.87	1.93	< 0.01**
Officials	3.03	2.00	< 0.01**
Members of the decision making bodies	3.06	2.73	0.07
NGOs and private players	2.9	1.8	0.05**

Maximum convergence was observed in Kottayam district. They have effectively utilised the BTT in bringing maximum convergence at the block level where the technical officers from Department of Agriculture, Animal husbandry and Fisheries were included. Moreover, Kottayam ATMA has maintained good rapport with the KVK and RARS Kumarakom.

Convergence was viewed from different perspective in the modified ATMA guidelines. Guideline says that there should be full convergence of extension related work being carried out under different programmes/schemes. The Revised scheme for Extension Reforms envisages for active involvement of research System/ research Agencies at different levels of implementation. Convergence with and involvement of Non-Governmental Sector is also coming under this broad concept which is to be described under Public Private Partnership. In all these areas, Kottayam has made improvements. Still the vertical and horizontal linkage between line department and farmer-researcher-extension linkage has to go a long way in both the districts.

4.1.3. Comparison of Implementation of ATMA in terms of Perception about Public-Private-Partnership by the Stakeholders .

A perusal of the Table 7 clearly tells that the respondents had a better appreciation of public private partnership in Kottayam district. This may be due to the fact that there is a strong and wide presence of NGOs in Kottayam district when compared to Thiruvananthapuram. Rubber Producers Societies (RPSs) are highly organised and doing diversified activity and have contributed a lot towards the implementation of ATMA in Kottayam. ATMA Kottayam maintained good liason with the farmers associations, cooperatives, RPS and voluntary organisations of the district. In Thiruvananthapuram district, the essence of decentralisation and concentration on agriculture was lacking which caused a poor performance of public private partnership.

Table 7. Perception mean score of respondents about public-private partnership.

Respondents	Mean score		P value
	Ktm (n=100)	Tvm (n=100)	
Farmers	2.86	1.97	< 0.01**
Officials	2.96	1.76	< 0.01**
Members of the decision making bodies	2.96	1.7	< 0.01**
NGOs and private players	3.4	1.5	< 0.01**

Kerala has been the trend setter for decentralised development in the country. Local Self Government institutions have emerged as effective agencies for the implementation of development programmes in the state. So PPP here has got an extra P in Kerala context that is 'Public Private Panchayat Partnership'. Kottayam is one among the districts where peoples plan campaign was praised for the speed and extent of coverage as well as the efficiency in implementation. If we make an analysis of the funds utilised for decentralized planning in Kottayam, major share is spent on agriculture sector. But in Thiruvananthapuram, funds are more for the infrastructure development or for the maintenance works.

Nathan (2011) in his study entitled People's perception of Public Private Partnership: A case analysis of Tiruppur water supply and sewage Project found that overall majority of beneficiaries are either satisfied or very satisfied about the service currently they are receiving.

4.1.4. Comparison of Implementation of ATMA in terms of Perception about Farming System Approach by the Stakeholders

Results in Table 8 clearly indicated that as far as farming system approach was concerned all categories of respondents exhibited a better mean score in Kottayam than that of Thiruvananthapuram district and the P value also indicated that the difference is significant.

Table 8. Perception mean score of respondents about farming system approach

Respondents	Mean score		P value
	Ktm (n=100)	Tvm (n=100)	
Farmers	3.13	2.23	< 0.01**
Officers	3.33	2.13	< 0.01**
Members of the decision making bodies	3.1	2.23	< 0.01**
NGOs and private partners	3.3	2.2	0.01**

One of the major focus of ATMA was farming system approach. Narrow focus of agricultural extension system (limited to crop management practices that too related to main cereals) has been expanded to include other crops and enterprises as well as complete farming technology. The integrated technology transfer system is catering to the farmers' needs related to agriculture, horticulture, animal husbandry and other enterprises in holistic way. ATMA promoted integrated farming and this approach is designed for the extension delivery in ATMA. Kottayam is a district where this approach was already existing in most of the areas. The nature of agriculture predominantly seen in Kottayam is different from that of Thiruvananthapuram. So this difference in

agriculture would reflect in farming system approach also. Naturally, it was possible to implement FSA effectively in Kottayam district. So there is no surprise that the respondents of Kottayam have unequivocally viewed that FSA perception is comparatively better in their district.

Kaur *et al* (2006) and Singh *et al* (2014) reported that diversified income generative enterprises introduced under ATMA played a crucial role to increase the income levels of the sample beneficiaries.

4.1.5. Comparison of Implementation of ATMA in terms of Perception about Group Approach

Regarding perception about group approach also the mean score was found to be higher in Kottayam than that of Thiruvananthapuram and the P value indicates that difference is significant with respect to three categories.

Table 9. Perception mean score of respondents about group approach

Respondents	Mean score		P value
	Ktm (n=100)	Tvm (n=100)	
Farmers	3.17	2.83	0.11
Officers	3.13	2.13	< 0.01**
Members of the decision making bodies	3.3	2.7	< 0.01**
NGOs and private partners	3.4	2.3	< 0.01**

When we make an analysis of the percentage of people engaged in agriculture in Thiruvananthapuram district, we can surely say that it is not an agricultural district. Kerala itself is not an agricultural state. With only 30 per cent contribution to employment generation and 10 per cent contribution to GDP

Kerala is classified as a non agricultural state (Kerala development report, 2008). On a segregated analysis with particular focus on Thiruvananthapuram district the trend will be alarming. But it is sure from field experience that employment in agriculture and the contribution of agriculture to the GDP, Kottayam will be far ahead than that of Thiruvananthapuram. Regarding the number of farmers also these two districts differs. Obviously, the farmer federations are less in Thiruvananthapuram district.

When we talk about Kottayam, the role of Rubber Producers Society has to be mentioned. Even World Bank has appreciated the contribution of RPS in enhancing productivity, value addition and technology consumption of rubber. RPS is a formal registered group. With this network of RPSs, the group oriented activities would take place effectively.

4.1.6. Comparison of Implementation of ATMA in terms of Perception about Gender and Equity Issues.

It is visible from Table 10 that Kottayam ATMA perceived better in terms of gender and equity issues than that of Thiruvananthapuram district and the difference between them is significant with respect to all the four categories of respondents.

Table 10. Perception mean score of respondents about gender and equity issues.

Respondents	Mean score		P value
	Ktm (n=100)	Tvm (n=100)	
Farmers	3.03	2.10	0.000*
Officers	3.06	2.46	0.000*
Members of the decision making bodies	2.93	2.46	0.026*
NGOs and private partners	3.1	2.5	0.030*

Literacy is crucial for promoting women's rights and achieving empowerment. Kottayam is the first district to achieve hundred per cent literacy in the whole of India. Naturally, gender awareness is higher and mainstreaming gender equality in development is well recognised in this district. This might have influenced the respondents in their positive perception towards this dimension.

Also the leadership of woman officer as Project Director ATMA itself had a positive effect in getting greater attention to women in ATMA programmes in Kottayam district

4.1.7. Comparison of Implementation of ATMA in terms of Perception about Farmer Oriented Activities

Under Farmer Oriented Activities category training, exposure visit of farmers, arranging demonstrations, farm schools etc. were conducted to sensitize the farmers about ATMA and to apprise about the latest technologies in agriculture and allied activities.

Table 11. Perception mean score of respondents about farmer oriented activities.

Respondents	Mean score		P value
	Ktm (n=100)	Tvm (n=100)	
Farmers	3.1	2.23	< 0.01**
Officers	3.43	2.73	< 0.01**
Members of the decision making bodies	3.26	2.33	< 0.01**
NGOs and private partners	3.2	2.7	0.156

A cursory view of Table 11 revealed that regarding farmer oriented activities also Kottayam got higher mean score and found to be significant with respect to three categories of respondents.

When we analyse the data such as number of trainings undergone by the farmers from annual report of respective ATMA and also the result of 'frequency of extension participation' of farmers in Kottayam with a good mean score indicate that Kottayam was far ahead in conducting farmer oriented activities compared to Thiruvananthapuram. During the field study, most of the farmers acclaim the quality of training programmes conducted by the ATMA Kottayam as more need based and locale specific. They take utmost care in ensuring advisory services to the farmers on demand. The demonstration plots showcase best practices to motivate other farmers to adopt the new technology. The field experiences of researcher in the farm schools in Kottayam was remarkable. This has been mainly due to proper identification of farmers by ATMA which is reflected through farmer motivation. In preparing SREP, the intensive field exercises and active participation of farmers, NGOs and other stakeholders were ensured in Kottayam. These are all the factors which might have influenced respondents of Kottayam to have more positive perception of related to farmer oriented activities.

This is something which Thiruvananthapuram has to emulate by way of giving more focus to the quality of farmer oriented activities.

4.1.8. Comparison of Implementation of ATMA in terms of Perception about Farm Information Dissemination

Results from Perception about farm information dissemination also follow the same trend as that of earlier results. It is presented in Table 12.

Table 12. Perception mean scores of respondents about farm information dissemination.

Respondents	Mean score		P value
	Ktm (n=100)	Tvm (n=100)	
Farmers	3.26	2.57	< 0.01**
Officers	3.23	2.83	0.01**
Members of the decision making bodies	3.2	2.7	< 0.01**
NGOs and private partners	3.2	3.1	0.687

There are several good measures taken by ATMA Kottayam to communicate the farm information to the farmers. One such measure was ATMA publication and circulation of newsletters on regular basis during training programmes, exposure visits, farm schools, technology meet etc. to keep the farming community informed. Many programmes such as seminars, melas are being organized to educate, support and encourage farmers. ATMA Kottayam maintained a fully functional website for more coverage. This website also facilitates marketing based on available market information and intelligence. Thiruvananthapuram also made developments from the earlier state of slow growth.

4.1.9. Comparison of Implementation of ATMA in terms of Perception about Research- Extension- Farmer (R-E-F) Linkages.

With regard to R-E-F linkage the mean score of perception of Kottayam is significantly higher than Thiruvananthapuram except for NGOs and private partners. The perception mean scores in this regard from the sample districts are contained in Table 13.

Table 13. Perception mean scores of respondents about research-extension-farmer linkages

Respondents	Mean score		P value
	Ktm (n=100)	Tvm (n=100)	
Farmers	3.00	2.33	< 0.01**
Officers	3.133	2.46	< 0.01**
Members of the decision making bodies	3.2	2.03	< 0.01**
NGOs and private partners	3.1	2.9	0.426

ATMA provides different platforms for the integration of researchers, farmers and extension personnel. R-E-F linkage activities include organizing farmer-scientist interactions, field days, Multidisciplinary Team Visit (MDT) and advisory services such as Monthly Technology Advices (MTA). In Kottayam district, there were regular interfaces of farmers, researchers and extension workers. MTA meetings were conducted as per the schedule. In the second week of every month pre- MTA meetings were conducted at the block level and on every 25th of the month MTA meetings were conducted at the district level where scientists of Kerala Agricultural University (KAU), extension officers of the State Department of Agriculture and farmers discussed and solved the problems in the field. Besides scheduled joint diagnostic field visits are being conducted by the project director ATMA with the scientists to the farmers fields. All these activities specified under R-E-F linkage were systematically conducted in Kottayam.

In Thiruvananthapuram also after the initial periods of incubation things have changed drastically. The farmers of Thiruvananthapuram are slowly becoming aware of the efforts made by ATMA Thiruvananthapuram.

4.1.10. Comparison of Implementation of ATMA in terms of Perception about Sustainability of Extension Services.

Perception mean score of the various stakeholders with respect to sustainability of extension services are presented in Table.14

Table 14. Perception mean scores of respondents sustainability of extension services

Respondents	Mean score		P value
	Ktm (n=100)	Tvm (n=100)	
Farmers	2.83	2.50	0.193
Officers	2.83	2.63	0.416
Members of the decision making bodies	2.93	2.73	0.294
NGOs and private partners	2.8	2.9	0.687

As can be seen from the table above, the perception mean scores with respect to sustainability of extension services is not that impressive compared to the promising results of other dimensions. None of the categories got a high mean score of above 3. Though Kottayam district exhibits a better score, it is not significantly higher than Thiruvananthapuram district.

The above result is indicative of the apprehensions of the stakeholders in the way this concept was envisaged under ATMA. A government programme is sustainable only when farmers are able to stand on their legs by developing the competencies to be independent when the supporting system withdraws. ATMA is in the process of government's long term goal of ensuring sustainability by way of cost sharing.

The sustainability issue was found worldwide and one of the strategy emerged was 'cost sharing'. But this concept is not always welcomed as some of the farmers are reluctant to bear cost. Sustainability can be ensured to an extent if farmers are well organised in to groups and the payment is borne by the groups.

4.1.11. Classification of ATMA Beneficiary Farmers based on Total Score for Perception.

Table 15. Distribution of ATMA beneficiaries based on total score for perception

Classification	Kottayam(n=30)		Thiruvananthapuram (n=30)	
	Frequency	%	Frequency	%
Low	5	16.67	6	20
Medium	21	70	22	73.33
High	4	13.33	2	6.67
	Mean = 30 SD = 5.04		Mean = 24 SD = 4.06	

From Table 15 it could be inferred that majority of the respondents in Kottayam and also in Thiruvananthapuram had medium level of perception about implementation of ATMA activities. The mean score of Kottayam (30) which is much higher than the mean score of Thiruvananthapuram district (24) reveals that

the perception of ATMA Kottayam is better than the other district. The total score for perception is the cumulative score of perception about each dimension. Most of the dimensions Kottayam showed better performance. Naturally the perception was more positive and higher in Kottayam district.

4.2. IMPACT OF ATMA IN BOTH THE DISTRICTS

Impact of ATMA is studied in terms of three parameters namely productivity, connectivity and resilience. This was studied from beneficiary farmers.

4.2.1. Productivity

The respondents of the study had an experience 1-2 years with ATMA when the present research study was executed. The productivity was measured in terms of increase or decrease in yield percentage for major crops owned by the farmer. Farmers were asked whether the yield of the crop has increased or not. Since most of the farmers were innovative, they regularly maintained the records of yield data of all the crops of their farm and seemed to be quite well aware of the changes in the yield after ATMA interventions. Farmers have given the yield of coconut in nuts/acre and other crops such as paddy, vegetables and banana in kg/acre before and after ATMA exposure. From that yield increase in percentage was worked out. The most encouraging result was that no one experienced a decrease in yield of crops after coming to ATMA.

4.2.1.1. Coconut

. The data presented in Table 16 revealed that majority of (70.83% in Kottayam and 82.61 per cent in Thiruvananthapuram) respondents recorded an increase up to 25 per cent in the productivity of coconut palms at their farm after they were exposed to ATMA interventions. It is presented in Figure 3. The

relevant agriculture technology disseminated in ATMA may be the reason for the improvement in the yield of coconuts.

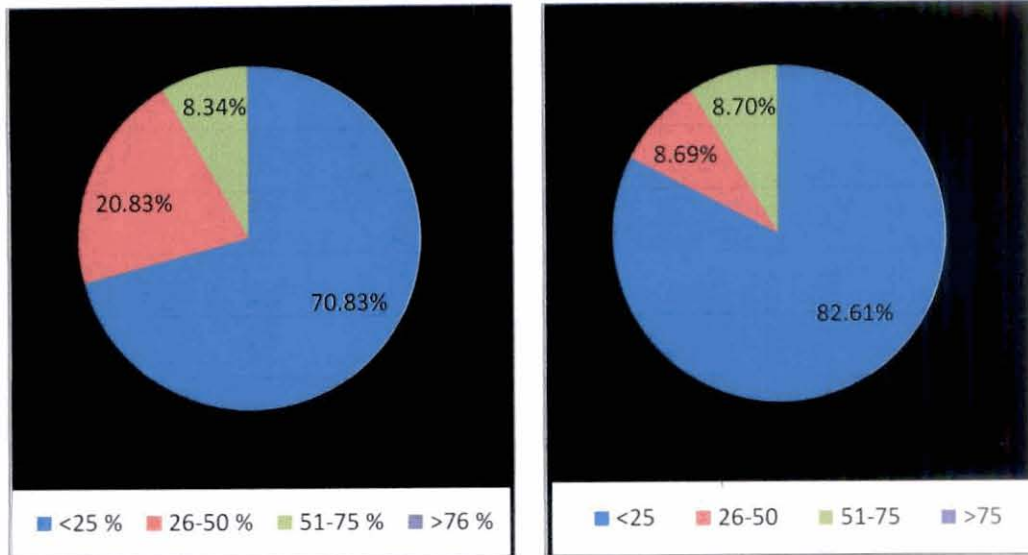
Table 16. Yield increase in Coconut after exposure to ATMA

Yield increase (%)	Kottayam (n=24)		Thiruvananthapuram(n=23)	
	Frequency*	%	Frequency*	%
No increase	0	0	0	0
<25	17	70.83	19	82.61
26-50	5	20.83	2	8.69
51-75	2	8.34	2	8.70
>75				

*6 farmers of Kottayam and 7 farmers of Thiruvananthapuram were not cultivating the crop.

One of the main reasons for low productivity of crops in Kerala is the increased incidence of pests and diseases. The increase in nut yield per palm may be attributed to the improved crop health management practices in coconut garden by way of agronomic intervention and crown management of palms disseminated under ATMA. Husk burial, drip irrigation, soil test based micro nutrient application, Integrated Pest Management and Integrated Nutrient Management were widely adopted by ATMA farmers. Farm field schools established as a part of ATMA cafeteria help the farmers to control pest and diseases and also disseminate the technology to more number of farmers. Since most of the coconut palms are in neglected condition and of low yield, it will take time to substitute it with high yielding coconut varieties and also to increase yield. That may be the reason for only up to 25 per cent increase in yield of coconut for majority of the farmers obtained.

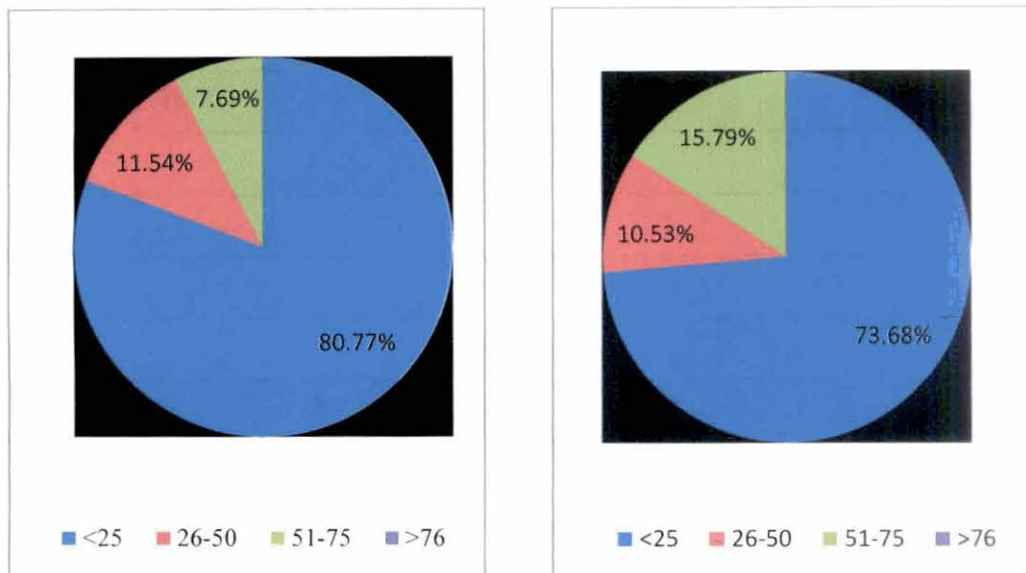
Figure 3. Yield increase in Coconut after exposure to ATMA



Kottayam district

Thiruvananthapuram district

Figure 4. Yield increase in Paddy after exposure to ATMA



Kottayam district

Thiruvananthapuram district

4.2.1.2. Paddy

The figures in Table 17 and Figure 4 indicates that the productivity of paddy also increased slightly for majority of the ATMA farmers in the two districts. As an outcome of the knowledge on application of bio-control agents, supplied through research centres and the department of agriculture a perceptible increase up to 25 per cent in yield for paddy was recorded by majority (80.77 per cent in Kottayam and 73.68 per cent in Thiruvananthapuram) of farmers. Participation in ATMA activities such as farm schools, farm field schools, demonstrations, trainings, exposure visits might have helped these farmers in getting the yield improvement techniques or interventions from extension personnel or fellow farmers.

Table 17. Yield increase in Paddy after exposure to ATMA

Yield increase (%)	Ktm (n=26)		Tvm (n=19)	
	Frequency*	%	Frequency*	%
No increase	-	-	-	-
<25	21	80.77	14	73.68
26-50	3	11.54	2	10.53
51-75	2	7.69	3	15.79
>75	-	-	-	-

*4 farmers of Kottayam and 11 farmers of Thiruvananthapuram were not cultivating the crop.

4.2.1.3. Banana

It is observed from Table 18 and from Figure 5 that the productivity of banana showed better performance among crops. Majority of farmers in Kottayam (51.78 per cent) and (57.71 per cent) in Thiruvananthapuram observed that productivity of banana increased to 26-50 per cent after they were exposed to ATMA.

Figure 5. Yield increase in Banana after exposure to ATMA

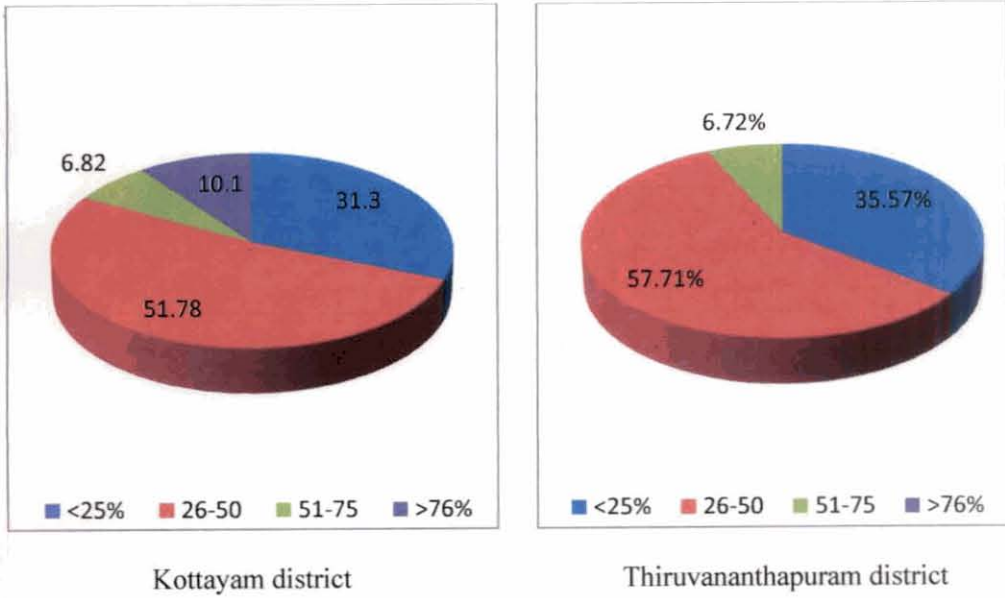


Figure 6. Yield increase in Vegetables after exposure to ATMA

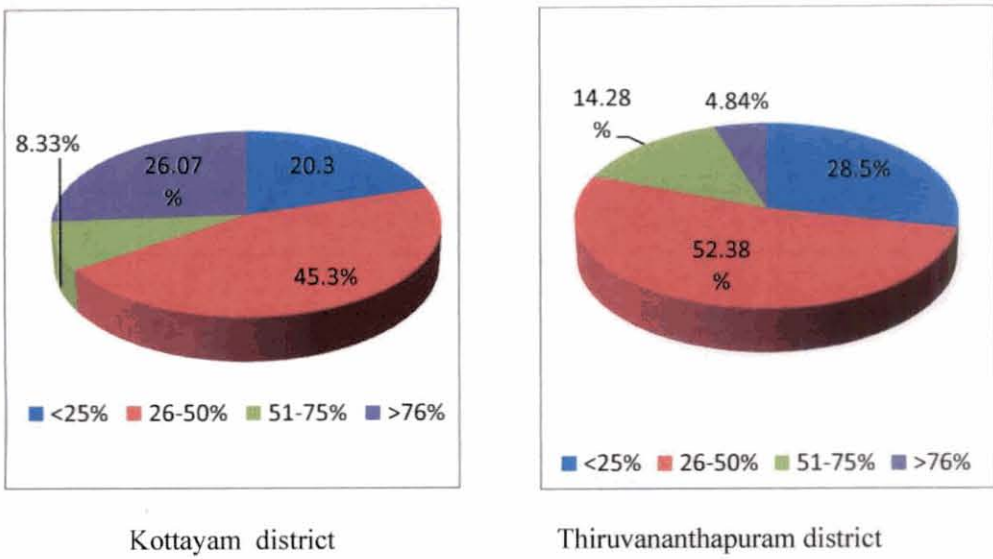


Table 18. Yield increase in Banana after exposure to ATMA

Yield increase in %	Kottayam (n=29)		Thiruvananthapuram (n=28)	
	Frequency*	%	Frequency*	%
No increase	0	0	0	0
<25	9	31.30	10	35.57
26-50	15	51.78	16	57.71
51-75	2	6.82	2	6.72
>75	3	10.10		

*1 farmer of Kottayam and 2 farmers of Thiruvananthapuram were not cultivating the crop

As far as farmers are concerned banana is one among the remunerative crop and the cultivated area is confined to more productive lands. Thus the crop has received better attention from the farmers. Latest techniques like integrated nutrient management, integrated pest management, liquid fertilizer application, plastic mulching, high density planting etc. are widely promoted under ATMA. So better crop specific production and protection strategies disseminated through ATMA via different platforms might have substantially contributed to high productivity of banana.

4.2.1.4. Vegetables

Table 19. Yield increase in Vegetables after exposure to ATMA

Yield increase (%)	Kottayam (n=24)		Thiruvananthapuram(n=21)	
	Frequency*	%	Frequency*	%
No increase	0	0	0	0
<25	5	20.3	6	28.5
26-50	11	45.3	11	52.38
51-75	2	8.33	3	14.28
>76	6	26.07	1	4.84

*6 farmers of Kottayam and 9 farmers of Thiruvananthapuram were not cultivating the crop.

Significant increase in yield of vegetables was noticed from Table 19 and Figure 6. Around 50 per cent of farmers perceived that productivity of vegetables increased to 26-50 per cent after participating in ATMA.

It is in conformity with the results of Nair (2013) that these four crops has shown perceptible yield increase in the LEADS districts.

4.2.2. Connectivity

An attempt was made to assess the extent of contact developed as a result of ATMA and the results are given in Table 20. It was very much encouraging to note that there was good contact between and within stakeholder groups of ATMA. In both the districts there was good contact among members of ATMA groups with a total score of 79 and 80 in Kottayam and Thiruvananthapuram respectively. Since ATMA provides various platforms for R-E-F interfaces, the connectivity was also good which is obvious from the results.

Table 20. Total score of connectivity

Category	Ktm (n=30)	Tvm (n=30)
	Total score	Total score
Farmer-official	75	67
Farmer-market	65	59
Officer-scientist	70	68
Among members of ATMA groups	79	80
Between ATMA groups	68	47

During field study the researcher could understand the 'pulse' of farmers. After joining ATMA, they had frequent contact with officials of Department of Agriculture and scientists from KAU. But farmers are in need of more market arrangements in ATMA for selling their produce which may be the reason for an average score in the case of farmer to market connectivity in two districts. The score of connectivity between ATMA groups in Kottayam was better because of the successful examples of federated groups formed. However, further strengthening of connectivity is required in both districts.

4.2.3. Resilience

Resilience of farmers was measured in terms of multiple cropping, integrated farming and value addition introduced at their farm. It is indicated in Table 21 that majority (56.67 per cent in Kottayam and 50 per cent in Thiruvananthapuram) of farmers newly introduced two components in their farm as an outcome of various project activities under ATMA. In the case of Kottayam 26.66 per cent farmers had all three components in their farm whereas in Thiruvananthapuram 23.33 per cent of farmers had three components to buffer the risks. Consequent to the execution of project activities by the participating departments under ATMA an encouraging result had been observed that all the 60 beneficiary farmers adopted these income generating enterprises for supplementing their income levels thereby developing the ability to meet the challenges.

Table 21. Distribution of farmer respondents based on resilience

Item	Kottayam (n=30)		Thiruvananthapuram (n=30)	
	Frequency	%	Frequency	%
1 component	5	16.67	8	26.67
2 components	17	56.67	15	50
3 components	8	26.66	7	23.33

This finding derives support from the study carried out by Kaur et al (2006) and Singh et al. (2014) who reported that most of the farming communities in project area were engaged in diversified farming after exposure to ATMA programmes.

4.3.1 Profile Characteristics of Farmers

This section relates to the distribution of beneficiary respondents of ATMA with respect to their profile characteristics and it includes the discussion relevant to those characters.

4.3.1.1. Age

The beneficiary farmers were grouped into young, middle and old aged to have a better understanding about the involvement of different age groups in various farming activities. The data is presented in Table 22 and in Figure 7. It seemed that majority (73.33 per cent) of the respondents in Kottayam and 83.33 per cent in Thiruvananthapuram constitutes middle and old age categories whereas only 26.67 per cent and 16.67 per cent were represented as the young aged category in Kottayam and Thiruvananthapuram respectively. The overall data indicated a similar trend. In Kerala situation, participation of youth in agriculture, is quite low. The reason for this least participation of young age group may be that they are not interested to take agriculture as a profession as they feel it as a profession with less social status.

Table 22. Distribution of farmer respondents based on their age

Sl No	Category (years)	Kottayam (n=30)		Thiruvananthapuram(n=30)	
		Frequency	%	Frequency	%
1	Less than 35	8	26.67	5	16.67
2	36-55	9	30	14	46.67
3	Above 55	13	43.33	11	36.66

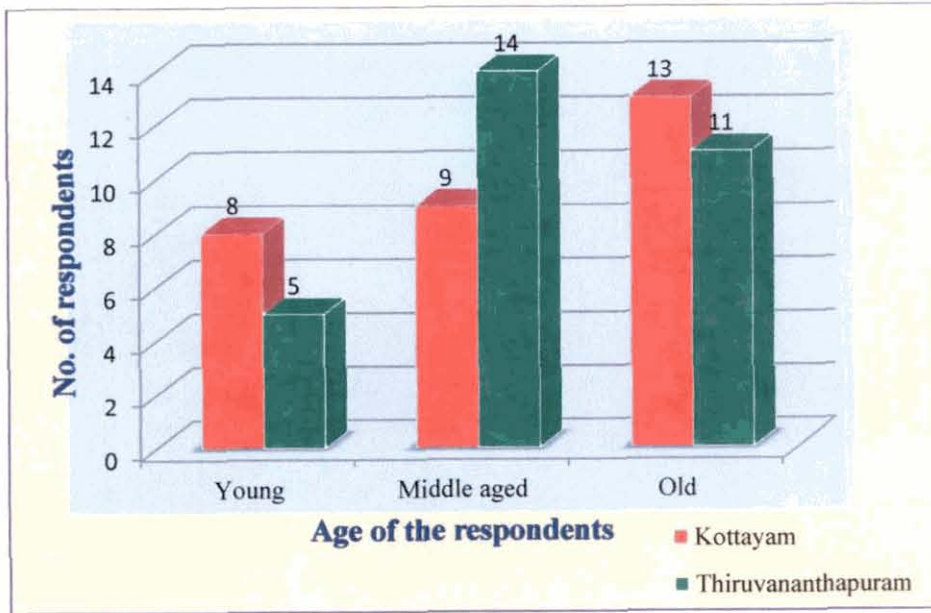


Figure 7. Distribution of respondents based on their age

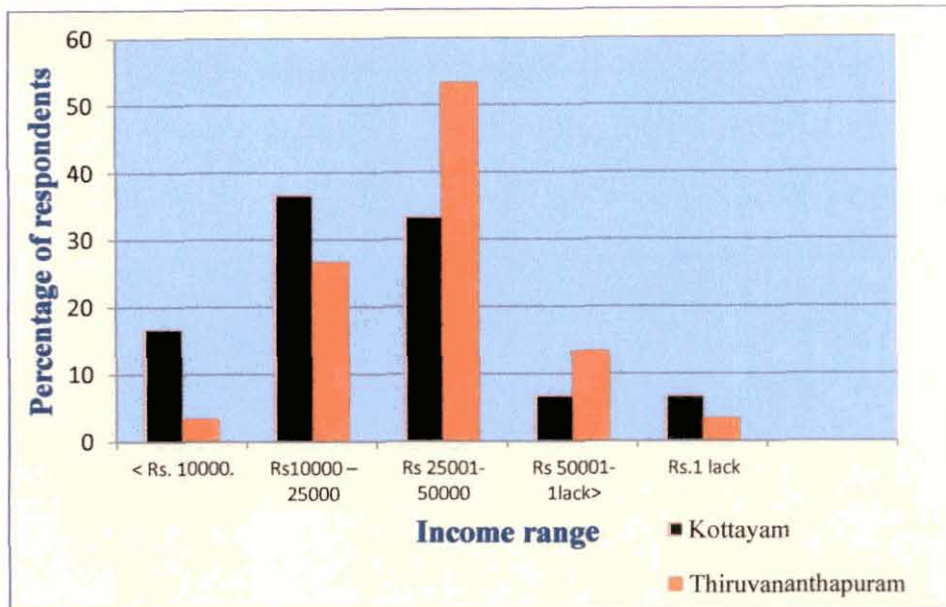


Figure 8. Distribution of respondents based on their annual income

This findings is in accordance with Chinchu (2011) who reported that majority of the respondents belonged to middle and old age categories.

4.3.1.2. Annual Income

Table 23. Distribution of farmer respondents based on their annual income.

Sl No	Category (years)	Kottayam (n=30)		Thiruvananthapuram (n=30)	
		Frequency	%	Frequency	%
1	≤ Rs. 10000.	5	16.67	1	3.33
2	Rs10001– 25000	11	36.67	8	26.67
3	Rs 25001-50000	10	33.33	16	53.33
4	Rs 50001-1lack>	2	6.67	4	13.33
5	Rs.1 lack	2	6.66	1	3.34

From the Table 23 and Figure 8, it is observed that 36.67 per cent of the respondents of Kottayam district came under income range 10001-25000. Another 33.33 per cent of respondents were having income ranging between 25001-50000. Majority (53.33 per cent) of the respondents of Thiruvananthapuram district were with an income ranging between 25001-50000, followed by 26.67 per cent with an income range between 10001-25000.

Above results indicate that medium level of annual income groups had involved in ATMA activities, due to their high level of awareness and interest to know about government programmes and schemes compared to other annual income groups.

4.3.1.3. Educational Status

Educational status of an individual is considered as one of the influencing factors for participation, awareness gain and adoption, as it influences farmers'

participation in extension activities and adoption of technologies suited to his condition. Therefore pertinent data were collected and presented in Table 24 and Figure 9.

Table 24. Distribution of farmer respondents based on their educational status

Category	Kottayam (n=30)		Thiruvananthapuram (n=30)	
	Frequency	%	Frequency	%
Illiterate	0	0	0	0
Write and read	0	0	1	3.33
Primary	0	0	4	13.33
High school	5	16.67	6	20
Higher secondary	15	50	6	20
College	10	33.33	13	43.34

An analysis of the educational status of the farmers of Kottayam district revealed that 50 per cent of them possessed higher secondary education, while one third (33.33 per cent) of them were graduates. It was interesting to note that there were no illiterates among the farmers and all of them were high school educated and above. This finding is in confirmation with the fact that Kottayam possess 100 per cent literacy rate.

From Table 24, it could be understood that around half (43.33 per cent) of the farmers of Thiruvananthapuram district educated up to college level and 20 per cent had in high school and secondary level of education followed by primary (13.33 per cent). A meagre percentage of the farmers fall under (3.33 per cent) functionally literate category. Most of the farmers in both districts were found to be middle and old aged. This could be the possible reason for the various education levels observed in the study.

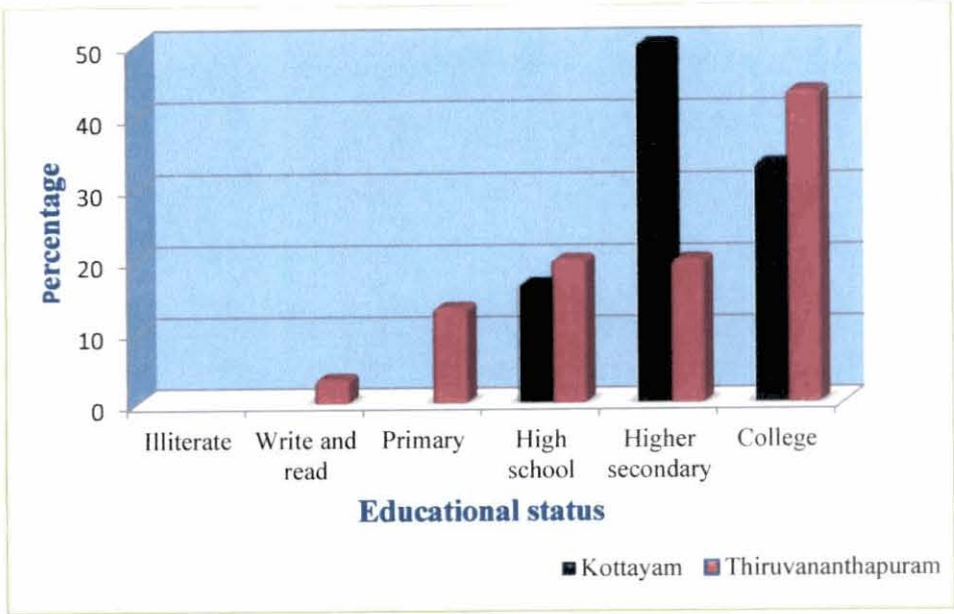


Figure 9. Distribution of respondents based on their educational status

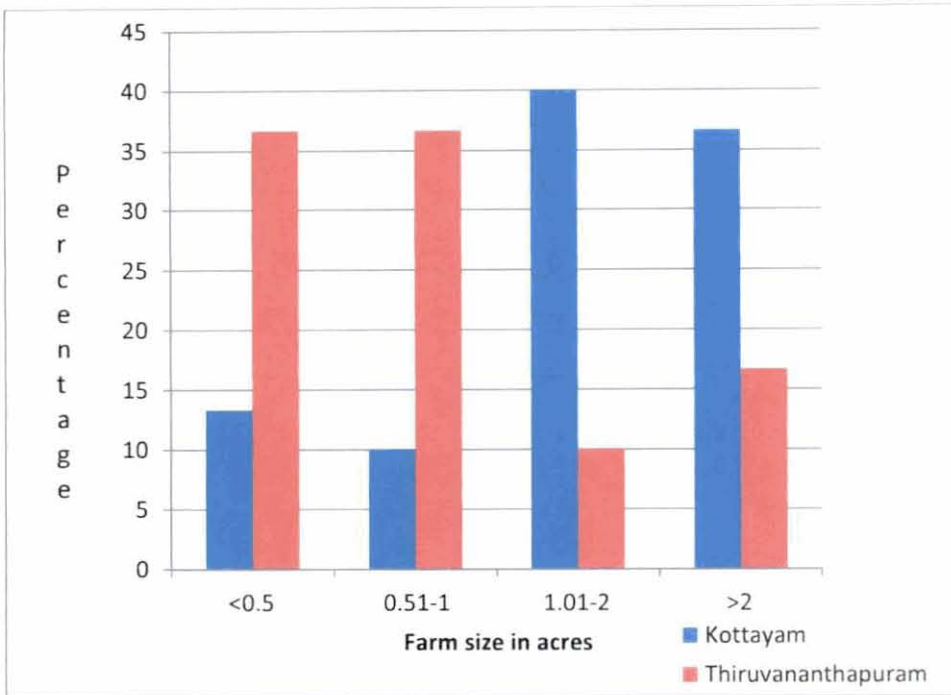


Figure 10. Percentage distribution of respondents based on farm size

4.3.1.4. Farm Size

The distribution of beneficiary farmers of ATMA on the basis of farm size is presented in Table 25 and Figure 10.

Table 25. Distribution of farmer respondents according to their farm size

Sl. No.	Area (acres)	Kottayam (n=30)		Thiruvananthapuram (n=30)	
		Frequency	%	Frequency	%
1	<0.5	4	13.33	11	36.67
2	0.51-1.0	3	10	11	36.67
3	1.01-2.0	12	40	3	10
4	>2	11	36.67	5	16.66

It is inferred from the above table that more than one third (36.67 per cent) of farmers possessed more than 2 acres of land and 40 per cent of farmers were cultivating in an area between 1- 2 acres in Kottayam district. While in the case of Thiruvananthapuram district, majority (73.34 per cent) of farmers cultivating in an area up to 1 acre. Only 16.66 per cent possess more than 2 acres of land.

4.3.1.5. Economic Motivation

Table 26. Distribution of farmer respondents based on economic motivation

Sl.No.	Category	Ktm (n=30)		Tvm (n=30)	
		Frequency	%	Frequency	%
1	Low	3	10	6	20
2	Medium	18	60	20	66.67
3	High	9	30	4	13.33

The distribution of ATMA beneficiaries according to their level of economic motivation presented in Table 26 indicated that 60 per cent of ATMA farmers in Kottayam had medium level of economic motivation, while 10 percent of the farmers had low level of economic motivation and remaining 30 per cent had high level of economic motivation whereas in Thiruvananthapuram district, 66.67 per cent had medium level of economic motivation and the number of farmers having low level of economic motivation is almost double that of Kottayam district. It is presented in Figure 11.

In Thiruvananthapuram district, more people are govt. employees and they are depending on the fixed monthly income. They may not be getting time for additional income generation activities either through agriculture or other enterprises. But in Kottayam, government employees are less and most of them are full time farmers and they have the basic urge and desire to earn more to improve their standard of living. This might have resulted in the medium to high level of economic motivation.

4.3.1.6. Farming Experience

There is a saying – “Experience is not what happens to a man; it is what a man does with what happens to him”. Knowledge or skill can be gained only by practice in doing something. Thus, this variable was selected for the study. The data collected in this aspect are presented in Table 26 and Figure 12.

Table 27. Distribution of farmer respondents according to their farming experience.

Sl.No.	Category	Ktm (n=30)		Tvm (n=30)	
		Frequency	%	Frequency	%
1	<5	8	26.67	7	23.33
2	6-10	1	3.33	3	10
3	11-25	11	36.67	6	20
4	>25	10	33.33	14	46.67

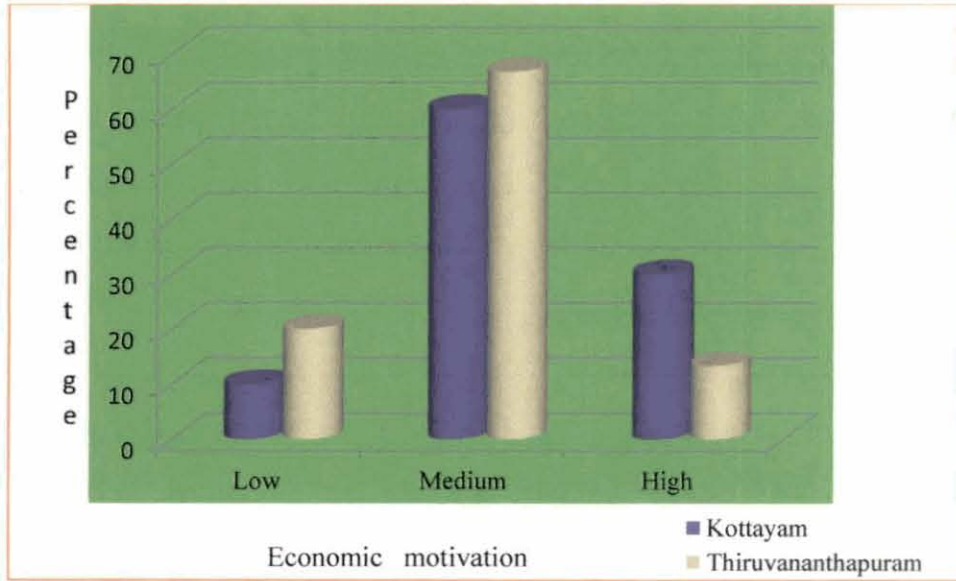


Figure 11. Category wise distribution of farmers based on their economic motivation

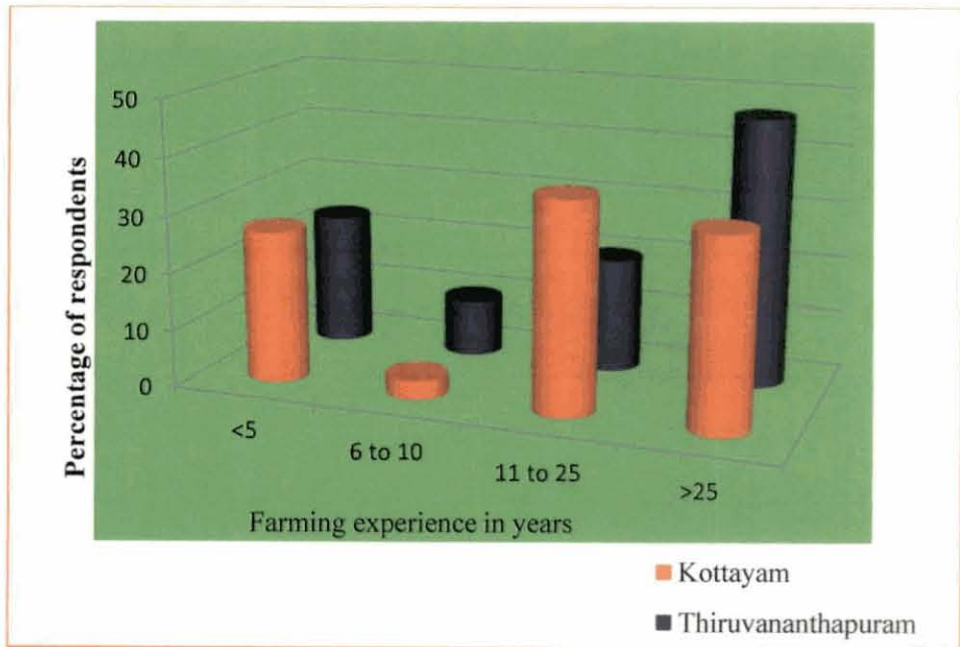


Figure 12. Distribution of farmers based on farming experience

From Table 27 it could be observed that a significant proportion (almost 70 per cent) of the farmers in Kottayam and Thiruvananthapuram district had more than 10 years of farming experience in which one third of the respondents in Kottayam and 46.67 per cent of the respondents in Thiruvananthapuram had more than 25 years of farming experience.

4.3.1.7. Innovativeness

Innovativeness lead to participation of farmers in extension activities and earlier acceptance of new farm technologies. In Table 28 and Figure 13 frequency distribution of farmers according to innovativeness are presented.

Table 28. Distribution of farmer respondents based on innovativeness.

Sl. No.	Category	Kottayam (n=30)		Thiruvananthapuram (n=30)	
		Frequency	%	Frequency	%
1	Low	3	10	7	23.33
2	Medium	25	83.33	17	56.67
3	High	2	6.67	6	20

It could be seen from the table that a high proportion (83.33 per cent) of the respondents had medium level of innovativeness followed by low (10 per cent) and high (6.67 per cent) levels in Kottayam. In Thiruvananthapuram district, only 56.66 per cent of the farmers had medium level of innovativeness. Even though, 20 per cent of farmers are in the high group, there is slight increase in the percentage of farmers in low group in Thiruvananthapuram compared to the other district.

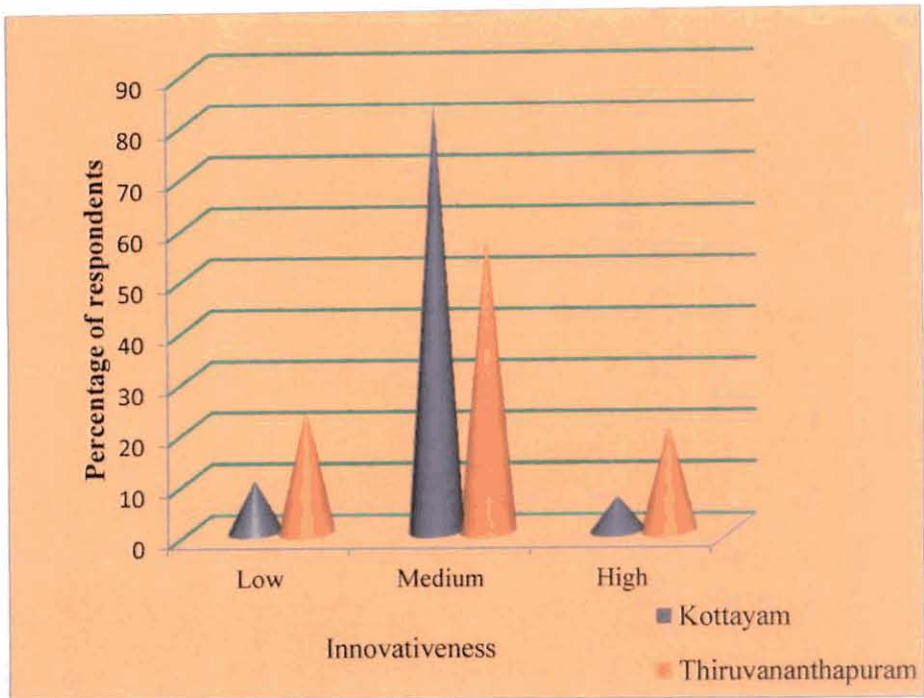


Figure 13. Category wise distribution of farmers based on innovativeness

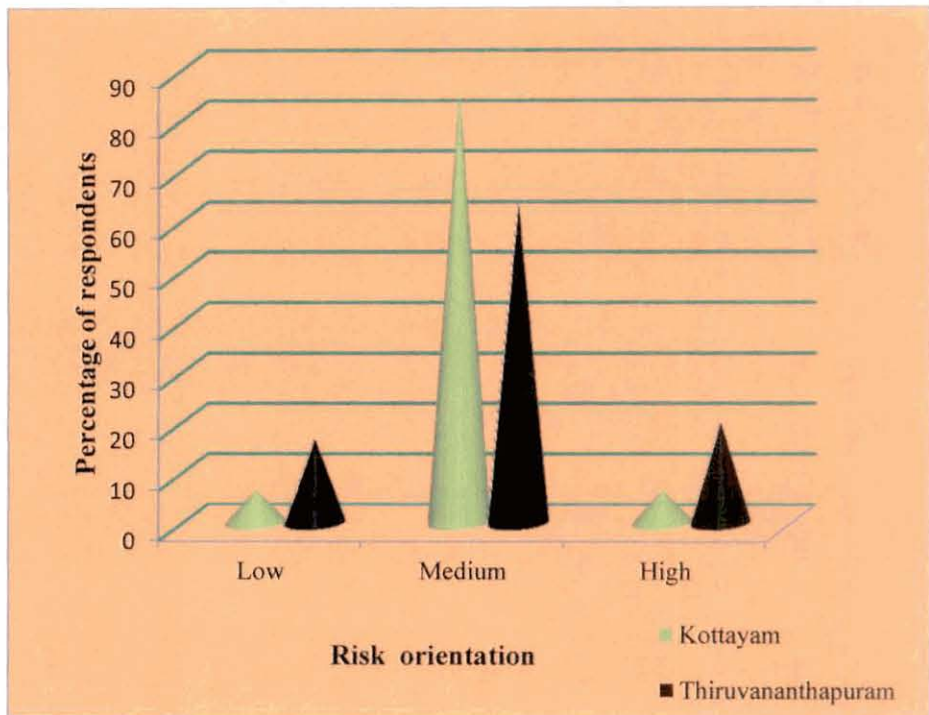


Figure 14. Distribution of farmers based on risk orientation

The medium to high level of innovativeness was due to the fact that most of the respondents were educated and they might have an urge to change the present situation and experiment with the new technologies in farming.

4.3.1.8. Risk Orientation

The distribution of ATMA beneficiaries according to their risk orientation is presented in Table 29 and Figure 14 reveals that 93 per cent of the beneficiaries of ATMA Kottayam were having medium to high risk orientation. When it comes to Thiruvananthapuram district, 83 per cent of the beneficiaries constitute the medium to high level category.

Table 29. Distribution of farmer respondents according to their risk orientation.

Sl. No.	Category	Kottayam (n=30)		Thiruvananthapuram (n=30)	
		Frequency	%	Frequency	%
1	Low	2	6.67	5	16.67
2	Medium	26	86.67	19	63.33
3	High	2	6.66	6	20

The reason for the medium to high level of risk orientation possessed by ATMA beneficiaries might be due to their education, innovativeness and better participation in extension activities which is desirable and quite promising.

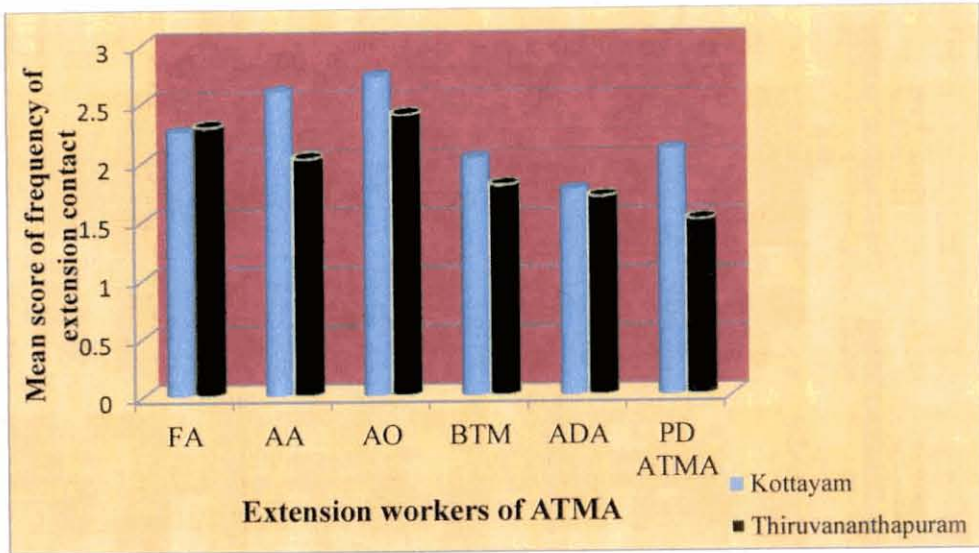
4.3.1.9. Extension Contact

Extension contact refers to the contact of the farmers with extension workers who help the farmers to learn new technologies and also help to gain adequate knowledge about the technologies. Hence, more the contact by the farmers with the extension agency, the participation in the innovative programmes by the farmers would also be high.

Table 30. Distribution of farmers based on frequency of contact with extension workers

Sl. No.	Category	Ktm (n=30) Mean score	Tvm (n=30) Mean score
1	Field Assistant (FA)	2.26	2.3
2	Agricultural Assistant (AA)	2.6	2.03
3	Agricultural Officer (AO)	2.73	2.4
4	Block Technology Manager (BTM)	2.03	1.8
5	Assistant Director of Agriculture (ADA)	1.76	1.7
6	Project Director ATMA	2.1	1.5

It is apparent from Table 30 and Figure 15 that Agricultural Officer is the frequently contacted person who got the highest mean score 2.73 in Kottayam district and also in Thiruvananthapuram with a mean score 2.4 , followed by Agricultural Assistant with a mean score of 2.6 and 2.03 in Kottayam and Thiruvananthapuram respectively. The main reason is the dedicated and consented service extended by the officials in the survey area. It is interesting to note that the Project Director ATMA Kottayam also got a high mean score compared to her counterpart in Thiruvananthapuram. This indicates the reach and efficiency of the controlling officer who used to conduct joint diagnostic visit to the farm fields with scientists and also a familiar face in most of the farmers meet conducted in Kottayam district.



FA- Field Assistant, AA- Agricultural Assistant, AO-Agricultural Officer, BTM- Block Technology Manager, PD - Project Director ADA- Assistant Director of Agriculture.

Figure 15. Distribution of farmers based on frequency of contact with extension workers

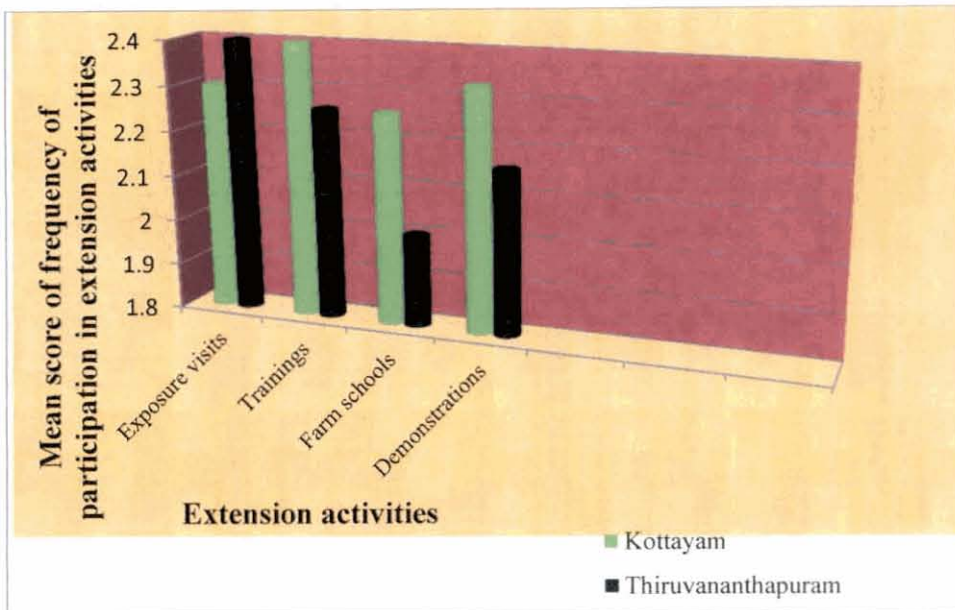


Figure 16. Distribution of farmers based on frequency of participation in extension activities.

4.3.1.10. Extension Participation

An attempt was made to assess the activity wise participation of beneficiaries in ATMA. Among the many activities carried out under ATMA programme, the major activities (farmer oriented activities) such as exposure visit, training, demonstration, farm schools were selected for the study.

Table 31. Distribution of farmer respondents based on participation in extension activities.

Sl No.	Category	Mean score	
		Ktm (n=30)	Tvm (n=30)
1	Exposure visits	2.3	2.4
2	Trainings	2.4	2.26
3	Farm schools	2.26	2.0
4	Demonstrations	2.33	2.16

From the Table 31 and Figure 16, it is evident that farmers most often participates in all the ATMA cafeteria activities and training with a mean score of 2.4 comes top in Kottayam whereas the frequency of participation in exposure visits was high in Thiruvananthapuram followed by participation in trainings. There is no much deviation in the frequency of participation in ATMA activities in these districts. Majority of the farmers participate in the cafeteria programmes for gaining latest information on crop production and allied activities.

4.3.1.11. Number of Trainings Undergone as part of ATMA

Frequency distribution of the farmers on the basis of the number of trainings they received are shown in the Table 32 and figure 17.

Table 32. Distribution of farmers on the basis of no. of trainings undergone

Category	Kottayam (n=30)		Thiruvananthapuram (n=30)	
	Frequency	%	Frequency	%
One to three	8	26.67	13	43.33
Four to six	13	43.33	10	33.33
More than 6	9	30	7	23.34

Under Farmer Oriented Activities category, training programmes for farmers were conducted to sensitize them about ATMA and to apprise about the latest technologies in agriculture and allied activities.

Of the total 30 farmers, 73.33 per cent have undergone more than four trainings as a part of ATMA Kottayam whereas only 56.67 per cent farmers participated in more than four trainings of ATMA in Thiruvananthapuram which indicates the regularity in participation of Kottayam farmers in trainings conducted by district ATMA.

4.3.1.12. *Mass Media Exposure*

Exposure to mass media is another important factor contributing to the awareness of individuals. Here the frequency of exposure of farmers to mass media like television, newspaper, magazine, bulletin were studied and were categorized in to three groups of low, medium and high exposure to mass media and data are presented in Table 33 and Figure 18.

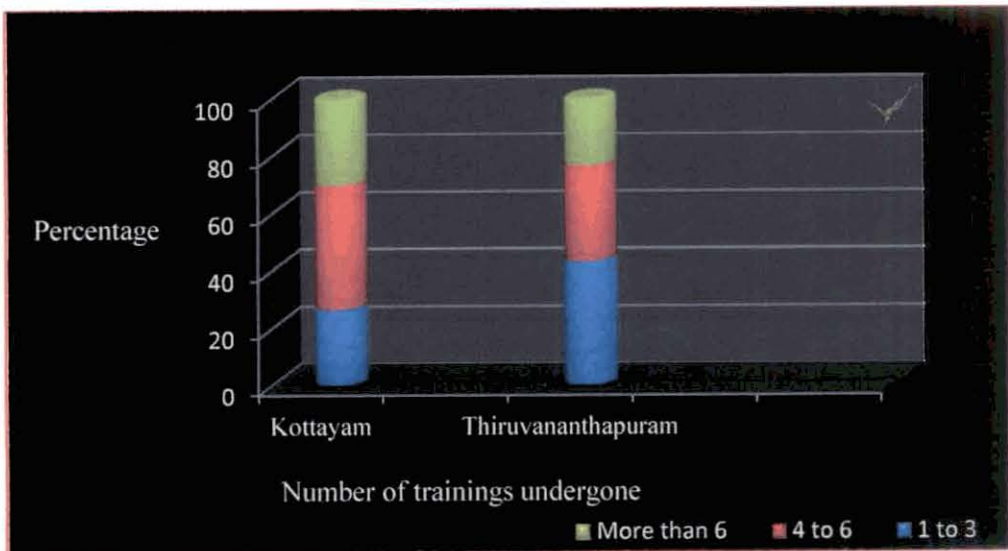


Figure 17. Distribution of respondents based on number of trainings undergone

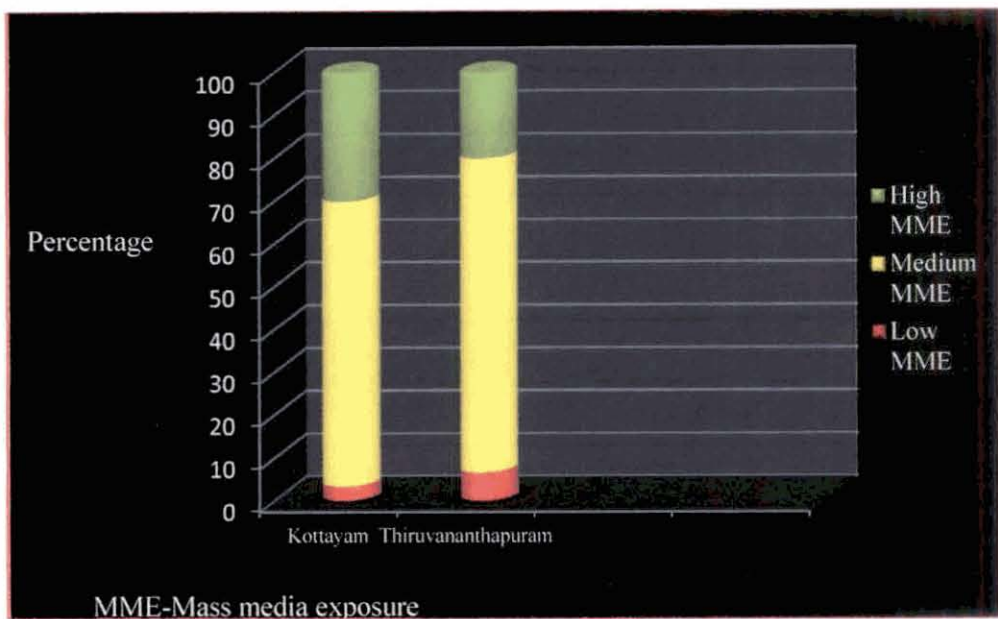


Figure 18. Distribution of respondents based on mass media exposure

Table 33. Distribution of farmer respondents based on mass media exposure

Category	Kottayam (n=30)		Thiruvananthapuram(n=30)	
	Frequency	%	Frequency	%
Low	1	3.33	2	6.67
Medium	20	66.67	22	73.33
High	9	30	6	20

A cursory glance at the data in the table reveals that among farmers of Kottayam district, 66.67 per cent were in medium group, 30 per cent were in high group and only 3.33 per cent were in low group as far as mass media exposure is concerned whereas 73.33 per cent of Thiruvananthapuram farmers were in medium group, 20 per cent were in high group and only 6.67 per cent were in low mass media exposure group.

Medium and high mass media exposure of farmers in both districts may have been due to their interest for acquiring new ideas in farming innovations.

4.3.2. Profile Characteristics of Implementing Officers of ATMA

4.3.2.1. Job Satisfaction

Table 34. Distribution of officers based on job satisfaction.

Category	Kottayam (n=30)		Thiruvananthapuram (n=30)	
	Frequency	%	Frequency	%
Low	2	6.67	8	26.67
Medium	24	80	19	63.33
High	4	13.33	3	10

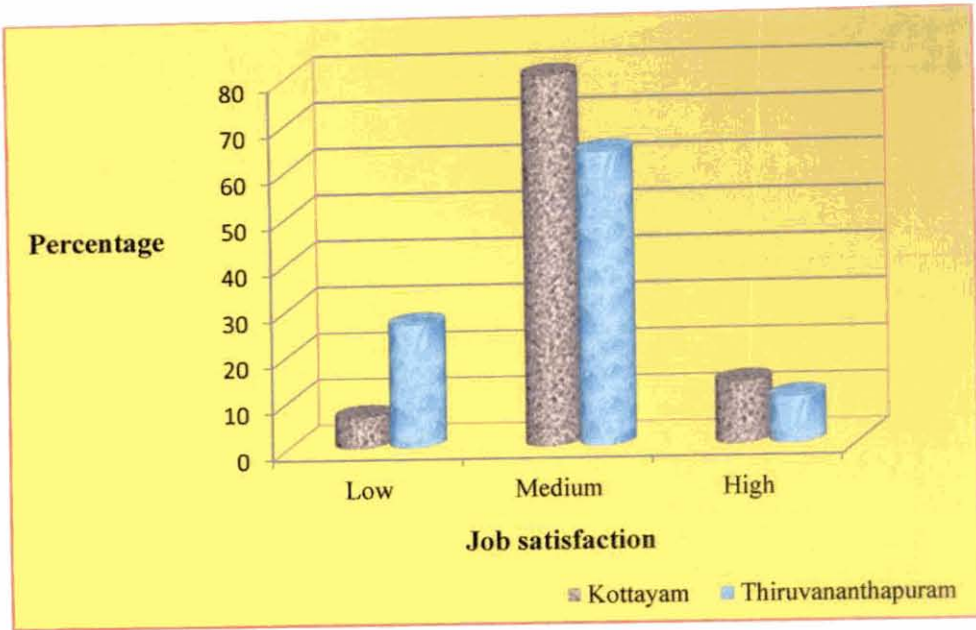


Figure 19. Distribution of respondents based on job satisfaction

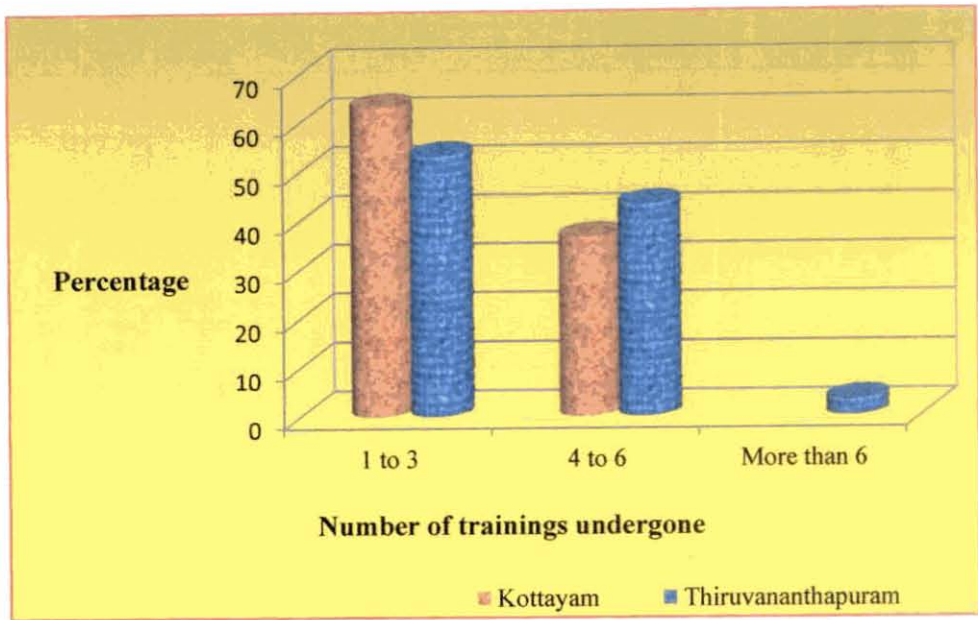


Figure 20. Distribution of extension workers based on number of trainings undergone

As can be seen from the Table 34 and Figure 19 that most (80 per cent) of the officers in Kottayam had medium level of job satisfaction. It was followed by high level (13.33 per cent) and low level (6.67 per cent) of job satisfaction. Naturally, this officers perceive positively the ATMA implementation in Kottayam district. In Thiruvananthapuram district, 63.33 per cent of officers constitute medium category and 26.67 per cent had low level of job satisfaction and 10 per cent of respondents had high level job satisfaction.

4.3.2.2. Distribution of Officers based on Number of Trainings Undergone

Regular trainings are conducted for extension workers for their capacity building. Data collected on the basis of training they received are shown in the Table 35 and Figure 20.

Table 35. Distribution of officers on the basis of no. of trainings undergone

Category	Kottayam (n=30)		Thiruvananthapuram (n=30)	
	Frequency	%	Frequency	%
1 -3	19	63.33	16	53.33
4-6	11	36.67	13	43.33
>6	0	0	1	3.34

A perusal of the data presented in the above table reveals that about 63.33 per cent of officers in Kottayam district and 53.33 per cent of officers in Thiruvananthapuram district have undergone one to three trainings only. 36.67 per cent of officers in Kottayam and 43.33 per cent of officers in Thiruvananthapuram received between 4 to 6 trainings as a part of ATMA. Also a meager 3.34 per cent of officers in Thiruvananthapuram participated in more than 6 trainings under ATMA. A slight increase in the number of officers who

have undergone more than 4 training under ATMA in Thiruvananthapuram which may be due to the vicinity of SAMETI, the state level training institute.

Actually ATMAs conduct different training programs in order to meet the target and utilize the budget provisions. During the review by higher authorities/institutions successful conduct of training/HRD activities and coverage of the training courses (in terms of number of participants) is also discussed. But, progress/performance is hardly reviewed in terms of extent of coverage of the target population (number of total concerned officers/functionaries). Thus, it is required that a time bound capacity building plan should be prepared with a target to train all the members.

4.3.3. Frequency of Participation of Members of Decision Making Bodies in ATMA Meetings

The data collected relevant to the frequency of participation of the ATMA GB/AMC/BFAC members are presented in the Table 36 and Figure 21.

Table 36. Distribution of respondents based on their frequency of participation in decision making bodies of ATMA

Category	Kottayam (n=30)		Thiruvananthapuram (n=30)	
	Frequency	%	Frequency	%
Low	4	13.33	11	36.67
Medium	24	80	16	53.33
High	2	6.67	3	10

It could be seen from table that 80 per cent of the members of the decision making bodies had medium level of participation in the meetings followed by low (13.33 per cent) and high (6.67 per cent) level in Kottayam

district. Whereas in Thiruvananthapuram district just more than half of the members (53.33) had medium level of participation in ATMA meetings.

The result clearly tells that regular and active participation of the members is lacking in Thiruvananthapuram district. It is therefore recommended to strictly conduct the Governing Board, AMC, BTT, BFAC meetings regularly with the involvement of grass root workers in planning, prioritizing and implementing the activities.

4.3.4. Extent of Participation of NGOs and Private Partners in ATMA Activities.

Table 37 shows that in Kottayam district, 70 per cent of respondents constituted the medium category followed by high (20 per cent) and remaining had low level of participation in ATMA activities. In Thiruvananthapuram district, 50 per cent of the respondents possessed medium level of participation in ATMA activities and comparatively more number in low level (4 persons) followed by high level. It is presented in Figure 22.

Table 37. Distribution of respondents based on their extent of participation in ATMA.

Category	Kottayam (n=10)		Thiruvananthapuram (n=10)	
	Frequency	%	Frequency	%
Low	1	10	4	40
Medium	7	70	5	50
High	2	20	1	10

ATMA Kottayam, have given a major thrust to the active involvement of NGOs and private input agencies and RPSs. They were involved in the decision making bodies and also maintained a close coordination with ATMA for

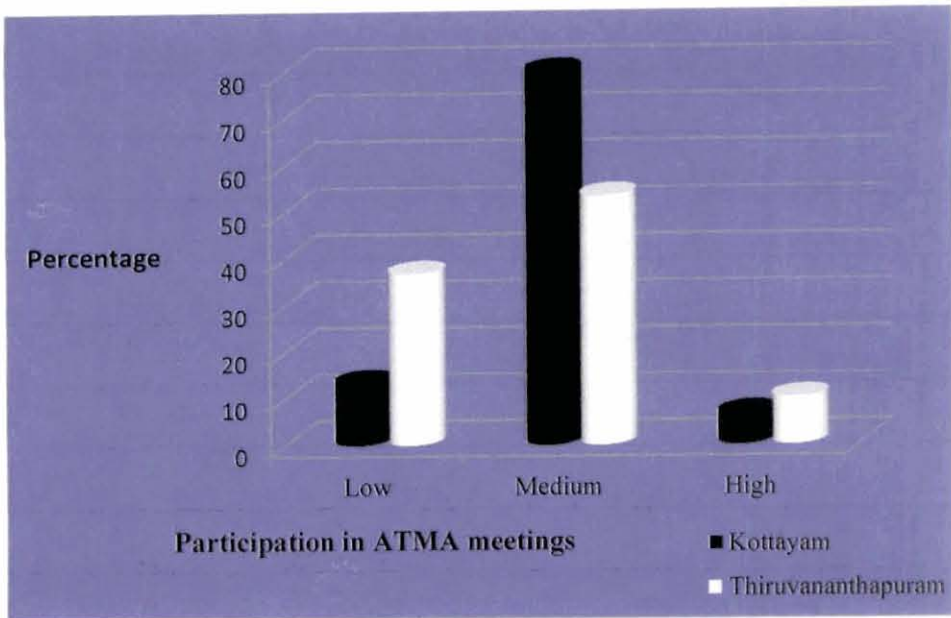


Figure 21. Category wise distribution of members of decision making bodies based on their frequency of participation in ATMA meetings

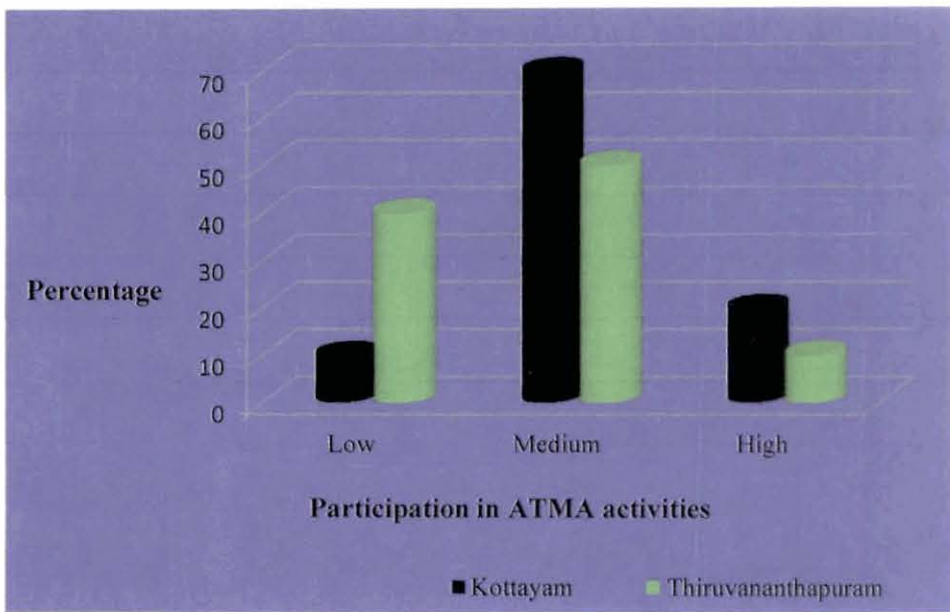


Figure 22. Category wise distribution of NGOs and private partners based on their participation in ATMA activities

formation and capacity building of farmers groups. When the respondents of Thiruvananthapuram district were asked about their involvement in ATMA, they were not participating regularly in the meetings and capacity building for farmers.

4.4. CORRELATION OF PROFILE CHARACTERISTICS OF FARMERS WITH PERCEPTION OF IMPLEMENTATION OF ATMA ACTIVITIES

To find out the relationship of selected profile characteristics of the beneficiaries with the dependent variable under study, correlation analysis was performed. Simple correlation coefficient were worked out and the results have been presented in the Table 38 and discussed below.

Table 38. Correlation analysis of independent variables with dependent variable.

Sl No.	Variable	Correlation coefficient ("r" value)	
		Ktm	Tvm
1	Age	0.049	0.362*
2	Annual income	0.204	0.12
3	Education	0.095	0.125
4	Land size	0.188	0.063
5	Economic motivation	0.356*	0.349*
6	Farming experience	0.143	0.159
7	Innovativeness	0.201	0.254
8	Risk orientation	0.278	0.211
9	Extension contact	0.670**	0.191
10	Extension participation	0.522**	0.304
11	No. of trainings undergone	0.377*	0.274
12	Mass media exposure	0.083	0.104

** - Significant at one per cent level

* - Significant at five per cent level

A bird's eye view of the results presented in Table 38 brings to focus the relationship of the profile characteristics with perception of farmers. Out of twelve variables studied four variables had shown positive significant relationship with perception about the implementation of ATMA in Kottayam in that extension contact and extension participation had shown positive and significant association at 1percent probability. Economic motivation and Number of trainings undergone showed significant relationship at 5 percent level whereas in Thiruvananthapuram, age and economic motivation had shown positive and significant relationship with perception of farmers.

Economic motivation was found to be positively and significantly related to perception of farmers. The developmental activities under ATMA particularly the new income generative enterprises undertaken might have played a crucial role to increase the income levels of the sample beneficiaries. Naturally they may become more inquisitive about the other benefits of the scheme. This might have resulted in more positive perception about the implementation of ATMA in both the districts.

Extension contact and extension participation were positively and significantly related to perception of farmers about the ATMA implementation in Kottayam district. Farmers had regular contact with the extension personnels and participated frequently in the trainings, exposure visits, demonstrations etc. as part of ATMA. Farmers were convinced of the benefits of this interaction with other progressive farmers and officers and naturally they will have more information of ATMA programmes and implementation. This might have resulted in better perception of ATMA activities.

It is interesting to see that age had a positive and significant relationship with perception of farmers in Thiruvananthapuram. As the farmers age and

experience in farming increases, their perception about ATMA also increases because they can better evaluate the extension reforms brought under the new setup of ATMA. It is also a known fact that agriculture is not a preferred occupation for the youth especially that of state capital where majority of the workforce being employed as government servants or in IT jobs.

4.5. CONSTRAINTS PERCEIVED IN THE IMPLEMENTATION OF ATMA IN THIRUVANANTHAPURAM AND KOTTAYAM DISTRICTS.

Constraint analysis is becoming one of the important components of extension research. Without analysing the constraints, it is impossible to enhance the participation of beneficiaries in any development scheme and also to remove the impediments in implementation. One of the objectives of this study is to analyse the constraints encountered by the beneficiaries of ATMA.

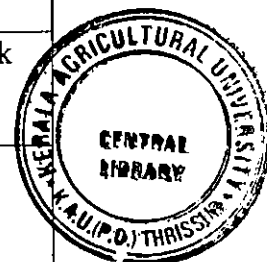
Therefore, the possible constraints were enumerated from related studies, in consultation with extension personnel, development workers and by having discussion with beneficiaries of non-sample area and administered to the beneficiaries to know the constraints encountered by them.

4.5.1. Constraints Perceived by Farmers in ATMA

Constraints were ranked based on the total score. From table 39 it is inferred that lack of coordination of line departments in providing service to the farmers was perceived as the most important constraint in both the district but the intensity is more in Thiruvananthapuram. That might be the reason for the weak perception about the convergence in Thiruvananthapuram district.

Table 39. Constraints perceived by farmers in ATMA

Constraints	Ktm		Tvm	
	Total score	Rank	Total score	Rank
Lack of coordination of line departments in providing service to the farmers	58	1	80	1
Bias in selecting the beneficiaries	53	3	64	2
Lack of support to ATMA groups	54	2	58	3
ATMA activities are not demand driven	52	4	54	4
Lack of usefulness of farmer oriented activities such as trainings, exposure visit, demonstrations etc.	40	5	47	5
Rank correlation coefficient		0.9**		



The very purpose of ATMA is to make the programmes demand driven. In both the districts, around half of the farmers are of the opinion that ATMA programmes are demand driven and the farmer oriented activities such as trainings, demonstrations, exposure visits etc. are really useful to them because these are related to their farm activity and it is adequate to their needs and problems. Bias in selecting the beneficiaries of ATMA programmes, was viewed as another major constraint in Thiruvananthapuram. It has to be admitted that the intensity of power politics in this district, being the political nerve of Kerala has its own disadvantage like this.

Farmers being the ultimate beneficiaries of the ATMA programme, an attempt was made to check whether there was any agreement in the constraints felt by respondents of two districts. Rank correlation coefficient obtained was 0.9. and it revealed that the constraints felt were more or less same in both the districts, though the intensity is less in Kottayam district.

4.5.2. Constraints Perceived by the Implementing Officers of ATMA

It is evident from Table 40 that the implementing officers of both the districts had shown difference in their constraints felt while implementing ATMA. In, Kottayam, lack of institutionalisation of ATMA is the major constraint perceived by the officers where as in Thiruvananthapuram, lack of single line of command appeared as the most important constraint. Like all other development programmes , reaching to a fully potential setup would take some more time.

Table 40. Constraints encountered by officers

Sl No.	Constraints	Ktm		Tvm	
		Total score	Rank	Total score	Rank
1	Lack of single line of command	64	2	73	1
2	Compartmentalisation of different stake holders	63	3	67	3
3	Lack of institutional isation	67	1	71	2
4	Inconsistency of contract staff	60	4	65	4

During the initial stages of ATMA implementation, lack of manpower became major constraint until Government of India modified guidelines, which

came in to existence in 2010 by which ATMA was strengthened with additional manpower support. Professionals from agriculture and allied sectors were posted as BTMs and DTMs and their technical know how and work along with the line department officials was acknowledged by the officers. Thus inconsistency of contract staff was least felt in both the districts.

4.5.3. Constraints Perceived by Members of the Decision Making Bodies of ATMA

Members of the decision making authorities such as GB, AMC and BFAC of the two districts felt that the lack of active participation of the stakeholders as the major constraint during the implementation of ATMA programme. The second important constraint is the lack of synergy among the line departments. These members perceived that the ATMA programmes in both the districts were being implemented without much deviation from the original plans and the beneficiary farmers under ATMA came through a fair selection. Constraints are furnished in Table 41.

Table 41. Constraints perceived by members of decision making authorities

Constraints	Kottayam		Thiruvananthapuram	
	Total score	Rank	Total score	Rank
Lack of active participation from the members	72	1	77	1
Lack of inter departmental coordination	65	2	71	2
Implementation of ATMA activities are deviating from the actual plans	60	4	67	3
Bias in the selection of farmer representatives	62	3	65	4

One of the reasons for the major constraints may be lack of ownership of the programme by various stakeholders. Most often the other line departments feel that ATMA is a scheme run by the parent Department- Department of Agriculture and some of the officials still seems to have a feeling that this is an additional burden imposed on them.

4.5.4. Constraints Perceived by NGOs and Private Partners

Table 42. Constraints perceived by NGOs and private partners in ATMA

Constraints	Kottayam		Thiruvananthapuram	
	Total score	Rank	Total score	Rank
Potential of NGOs is not at all utilized in ATMA	12	3	19	2
NGOs are not consulted before implementing the activities	20	1	18	3
NGOs are not at all taken in to confidence by other stakeholders	18	2	26	1

It could be inferred from Table 42 that NGOs and private partners involved in ATMA Kottayam felt that they were not much consulted before implementing the ATMA activities which is also the second important constraint felt by the NGOs of Thiruvananthapuram district. They also have a feeling that they are not taken in to confidence by the Government agencies or Departments, which appeared as the most important constraint and second important constraint perceived by Thiruvananthapuram NGOs and Kottayam NGOs respectively. Due to the active participation of NGOs in Kottayam for mobilising farmers and their capacity building, they were least felt that their potential is not at all utilized in

ATMA where as in Thiruvananthapuram, this was the second important constraint perceived by the NGOs. Most of the NGOs in the district are of the opinion that their participation and contributions must be sought by the district ATMA.

4.5.5. Suggestions Offered by the Farmers

The respondents were requested to express their suggestions to improve the benefits of ATMA programme. The responses are listed in Table 43.

Table 43. Suggestions offered by farmers

Suggestion	Kottayam		Thiruvanthapuram	
	Total score	Rank	Total score	Rank
Regular monitoring of ATMA activities	59	3	47	3
Beneficiaries should be identified from gramasabha	71	1	64	2
Farmers should be consulted before planning farmer oriented activities such as training, exposure visit etc.	64	2	82	1

It could be observed from Table 43 that in Kottayam district, 'beneficiaries should be identified from gramasabha' was the most important suggestion given by farmers. While in Thiruvananthapuram, farmers strongly suggested that they should be consulted before planning ATMA farmer oriented activities such as trainings, exposure visits etc. In order to make the ATMA programmes more need based, farmers participation has to be improved in team which prepares

SREP and BAP. Farmers should monitor the progress of the activities in the field. Farmers' suggestion might be accepted and included in the SREP and BAP. Farmers should have the power to select and reject any activity proposed. This suggestion might have come due to the inbuilt flaws in ATMA implementation which is not ensuring farmer participation at various levels of implementation of ATMA. Farmers have to be empowered to the level of implementation and controlling of ATMA activities.

4.5.6. Suggestions Offered by the Implementing Officials

Table 44. Suggestions offered by Officers

Suggestion	Kottayam		Thiruvananthapuram	
	Total score	Rank	Total score	Rank
Definite role and responsibility should be given to the implementing officers	84	1	81	1
Regular monitoring and evaluation of activities done by implementing officers	71	3	76	3
Inclusion of mainstream officials of the department in to ATMA	73	2	80	2

As far as the officers of the two districts are concerned they are almost having the same opinion to improve the ATMA implementation. They ranked the suggestions in the same order. Officers are more in need of definite role and responsibility in ATMA. Until and unless a clear instruction is given regarding the role and responsibilities of the officers at various levels, ATMA programmes would not bring expected results. So for the institutionalised view, the concept should be made clear among officials. Hence efforts must be directed towards

capacity building and creating awareness about processes of reforms which will help them to have higher perception towards reforms and there by better implementation.

Officials from line departments are of the opinion that mainstream staff from the departments particularly at the lower levels are to be included in ATMA implementation along with the contract staff. Since these officials have contacts with the farmers and know the agriculture of that area for a quite good time better than the contract staff, their capacities and experiences should be utilised in ATMA.

Officers also pointed that efforts should be taken for regular monitoring and evaluation of ATMA activities which plays a pivotal role in the success or failure of the programme.

4.5.7. Suggestions Offered by Members of Decision Making Bodies.

Table 45. Suggestions offered by members of GB, AMC, BFAC

Suggestions	Ktm		Tvm	
	Total score	Rank	Total score	Rank
Participation of different stakeholders should be ensured	71	3	83	3
Utilise the full potential of BFAC to make ATMA programmes more demand driven	76	1	79	1
Selection of farmer representatives should stick to the norms	74	2	82	2

The suggestions offered by the members of the various decision making authorities such as GB, AMC and BFAC are presented in Table 45. People representing from different stakeholders of ATMA in these two districts were of the same view in giving the suggestions for improving ATMA also. Utilise the potential of BFAC in order to make ATMA programmes more demand driven came as the most important suggestion followed by sticking to the norms for selecting the farmer beneficiaries. Active participation of stakeholders should be ensured to get the desired result from ATMA was the third important suggestion pointed out by the members.

4.5.8. Suggestions Offered by NGOs and Private Partners.

While carrying out the interview, the NGOs associated with ATMA offered suggestions for the improvement of ATMA which is presented in Table 46.

Table 46. Suggestions offered by NGOs and private partners.

Sl No.	Suggestions	Kottayam		Thiruvananthapuram	
		Total score	Rank	Total score	Rank
1	NGOs and private partners must be included while preparing SREP, BAP.	25	1	27	1
2	Conducting demonstration plots, trainings, forming farmer groups etc. must be allotted for NGOs also.	23	2	26	2

The results show that ensuring of enhanced participation of NGOs and other private partners in the SREP preparation and in the development of block

action plan emerged as the most important suggestion in both districts. More allocation of ATMA cafeteria activities to NGOs came as the second important suggestion. The potential of NGOs for motivating and mobilizing farmers in ATMA activities and organizing them into farmer's groups must be utilized to the fullest in ATMA. Also, private input agencies who are having closer proximity to farmers in villages were of the opinion that they should be gainfully involved in ATMA activities.

Though ATMA scheme entails a minimum 10 per cent of allocation on recurring activities at district level to be used through the participation of non-governmental sector, their suggestion of promoting the involvement of the voluntary sector in the ATMA activities clearly tells that PPP in ATMA is yet to take shape as envisaged under the scheme.

4.6. SUGGESTIONS FOR STREAMLINING ATMA

- The ATMA groups formed are to be strengthened by imparting regular trainings – even trainings on soft skills is needed. Marketing and production planning are the two main areas where they are to be empowered. Since the local extension officer is in charge of the group formation and its sustenance, they are also to be professionally trained for running the groups and continuing their activities. Social Capital Development is another area of thrust to make ATMA groups more sustainable.

- Most often the personnel of the Line Departments feel that approaches of ATMA as a scheme run by the Department of Agriculture and they are not in a position to present the clients as beneficiaries of ATMA. Instead, they usually bring them under ATMA programmes for getting financial assistance or subsidies which could be met by the ATMA programmes.

These clients will not feel ATMA as an agency for 'single umbrella' approach and the sustainability of the system will be as that of a regular scheme of the Government rather than feeling it institutionalised. So for the institutionalised view, the concept of viewing clients as the members of ATMA, where a holistic view for their overall development is needed. In short, the personnel of the line departments must also develop a sense of ownership of the ATMA program.

- Establish strong linkages with private sector in pooling resources and sharing extension programmes in line with the SREP-Research-Extension strategies. Prepare an inventory of the private sector agencies in the district and working in close coordination with them for extension delivery.
- ATMA was formed with an institutional arrangement of convergence of agriculture and allied departments with a gap filling mechanism for upliftment. It was observed in some areas of the districts and blocks, the convergence remaining to be the activity of Department of Agriculture alone. A number of psychological and situational barriers hamper effective convergence of departments. So effective strategic models should be developed for convergence among various schemes and line departments at all levels.
- Most often, the concept of viewing ATMA as a development tool is forgotten as far as the client groups are concerned. All the necessary mechanism – now at the Block Level – is to be used at the field level for the primary rapport building process between the clients and different line departments. This will surely make the real convergence.
- The Block level – BTT- meeting should have the provision for presenting the schemes and services offered by each department and it should be

made mandatory. This will aid in the conceptualisation of programme implementation and a block level or regional level strategy can be planned and fixed for the integrated scheme administration. (For eg. Usually, the animal husbandry farmers complain about the excess cow dung in their premises at the same time the agri farmers are looking for it.) If these types of information are available during the course of programme planning, efficient strategies can be formed and ATMA would be the best platform for it. The Block Level Farmers' Advisory Committee should also effectively function to provide farmer input to BTT.

- A training and monitoring system for the officials is needed regarding the institutional administration, management and programme diversification. Usually, exposure visits, trainings and other extension tools will be undertaken when the targets are received from the higher ups. But there is every freedom and provision in ATMA that it can generate its own resources including finance and can themselves make all interventions as per requirement. There are many ATMAs in the country where they have sufficient funds under their custody much above the contribution from the Government. So a mechanism for the empowerment of the local officials in this regard is quite necessary.
- A technology meeting at quarterly intervals is needed for the effective communication of the new technologies and convergence of all the line departments at the Block level to develop a suitable strategy for the technology dissemination and management of adoption.
- Most often, the scheme components of the major programmes are not directly linked with ATMA. For eg., the training component under Vegetable Development Programme of the state have the fullest possible opportunity to be linked with ATMA. But, no where this seems to have happened.

- ATMA linked extension tools such as the exposure visits and on farm trainings are to be conducted as per the requirement of the ATMA group which must result from the decentralised decision making process.
- Since ATMA is flexible and location specific, regional or local level strategies are to be framed before every cropping season with the help of Agricultural Officers of the locality, BTMs, FAs etc.
- The concept of farming system approach forms the basis for the generation of a production plan. Usually, the Departments are concerned with the production and the ATMA is with extension alone. This has to be clubbed based on a production plan of the locality and the district level ATMA can take a leading role in this regard.

SUMMARY

5. SUMMARY

In order to address the key constraints faced by extension system in the country with respect to reducing capacity of public extension services, its lack of decentralized and demand driven focus, Agricultural Technology Management Agency (ATMA) was evolved. ATMA functions as a registered society at district level and serves as a focal point for integrating research and extension activities and helps in decentralizing the management of agricultural technology transfer. It was introduced as a pilot project in 28 districts during 1998-2003. Following a positive feedback from the pilot implementation, the ATMA model was scaled up throughout the country in 2007. In June 2010, revised guidelines for ATMA were issued in order to incorporate the lessons learnt from the implementation thus far. However, several operational and organizational challenges continue to confront the ATMA as a system of extension. IRMA report on monitoring and evaluation of ATMA for the year 2011-12 revealed that there was a wide difference in the districts in the efficiency of ATMA implementation in Kerala.

The present study was conducted during 2013-14 to compare the implementation of ATMA activities in Thiruvananthapuram and Kottayam districts of Kerala to come up with suggestions for improvement in the programme.

Thiruvananthapuram district was selected as one of the locale as it was one among few districts where ATMA was implemented in the initial phase itself. Kottayam district was the other locale for the study wherein ATMA was established in the second phase and ATMA activities are carried out well which was also ranked first among the district level ATMAs of the state in the evaluation report of IRMA.

Multi stage random sampling technique was followed. In this study there were four categories of respondents namely farmers, implementing officials of ATMA, members of the decision making authorities and NGOs and private partners. The total number of respondents for the study was 200. The data were collected using a pre tested and structured interview schedule and questionnaire. The dependent variable perception about implementation of ATMA activities was measured in terms of key reforms of ATMA. Impact indicators of ATMA were also quantified. The profile characteristics of the respondents were also studied. Constraints and suggestions perceived by the respondents during implementation of ATMA were ranked. Also the suggestion based on the field level experience of the researcher was incorporated for further streamlining of ATMA.

The salient findings of the study are summarised below:

1. The major findings of the study regarding the perception of implementation of ATMA activities revealed that for each category of respondents, the perception about the implementation of ATMA activities was highly positive and significantly higher in Kottayam than that in Thiruvananthapuram district in terms of most of the key reforms of ATMA. From the total score for perception it was observed that majority of the respondents in Kottayam and also in Thiruvananthapuram had medium level of perception about implementation of ATMA activities and the perception mean score was higher in Kottayam than that in Thiruvananthapuram district.
2. The study has brought out that majority of (70.83 per cent in Kottayam and 82.61 per cent in Thiruvananthapuram) ATMA farmers observe a slight increase up to 25 per cent in the productivity of coconut palms at their farm after they were exposed to ATMA interventions. Productivity of paddy also increased slightly for majority of the ATMA farmers in the

two districts. Productivity of banana exhibited better performance among all crops. Majority of farmers in Kottayam (51.78%) and (57.71%) in Thiruvananthapuram observed that productivity of banana increased by 26-50 per cent after they were exposed to ATMA. Around 50 per cent of farmers perceived that productivity of vegetables increased by 26-50 per cent after participating in ATMA.

3. It was very much encouraging to note that there was a good contact between and within stakeholder groups of ATMA. In both the districts there is good contact among members of ATMA groups with a total score of 79 and 80 in Kottayam and Thiruvananthapuram respectively.
4. With respect to resilience, majority (56.67 per cent in Kottayam and 50 per cent in Thiruvananthapuram) of farmers newly introduced two components in their farm as an outcome of various project activities under ATMA. In the case of Kottayam 26.66 per cent farmers had all three components in their farm whereas in Thiruvananthapuram 23.33 per cent of farmers had three components to buffer the risks.
5. The frequency distribution of the profile characteristics of the farmers revealed that 73.33 per cent in Kottayam and 83.33 per cent in Thiruvananthapuram belonged to middle and old age categories whereas only 26.67 per cent in Kottayam and 16.67 per cent in Thiruvananthapuram were young aged. Majority (53.33 per cent) of the respondents of Thiruvananthapuram district had an income range of 25001-50000. While 36.67 per cent of the respondents of Kottayam had income between 10000-25000, another 33.33 per cent of respondents were having income between 25001-50000. An analysis of the educational status of the farmers of Kottayam district revealed that 50 per cent of them possessed higher secondary education, and there were no illiterates among the farmers. Around half (43.33 per cent) of the farmers of Thiruvananthapuram district were educated up to college level. Regarding land size, more than one third (36.67 per cent) of farmers possessed more than 2 acres of land and 40 per cent of farmers were cultivating in an area

between 1- 2 acres in Kottayam district. While in the case of Thiruvananthapuram district, majority (73.34 per cent) of farmers were cultivating in an area up to 1 acre. 60 per cent of ATMA farmers in Kottayam and 66.67 per cent of farmers in Thiruvananthapuram district possessed medium level of economic motivation. A significant proportion (almost 70 per cent) of the farmers in Kottayam and Thiruvananthapuram (66.67 per cent) had more than 10 years of farming experience. 93 per cent of the beneficiaries of ATMA Kottayam were having medium to high risk orientation. When it comes to Thiruvananthapuram district, 83 per cent of the beneficiaries constitute the medium and high level categories. Regarding extension contact, Agricultural Officer is the frequently contacted person who got the highest mean score of 2.73 in Kottayam district and also in Thiruvananthapuram with a mean score 2.4. Farmers most often participated in all the ATMA cafeteria activities and in that training with a mean score of 2.4 comes to top in Kottayam whereas the frequency of participation in exposure visits was high in Thiruvananthapuram. Majority (73.33 per cent) of farmers have undergone more than 4 trainings as part of ATMA Kottayam where only 56.67 per cent participated in more than four trainings of ATMA in Thiruvananthapuram. When it comes to mass media exposure of farmers, 66.67 per cent were in medium group and 30 per cent were in high group in Kottayam whereas 73.33 per cent were in medium group followed by 20 per cent in high group in Thiruvananthapuram district.

6. Most (80 per cent) of the officers in Kottayam had medium level of job satisfaction. In Thiruvananthapuram district, 63.33 per cent of officers constitute medium category and 26.67 per cent had low level of job satisfaction. With respect to trainings, about 63.33 per cent of officers in Kottayam district and 53.33 per cent of officers in Thiruvananthapuram district had undergone one to three trainings only.

7. Majority (80 per cent) of the members of the decision making authorities had medium level of participation in meetings in Kottayam district, whereas in Thiruvananthapuram district just more than half of the members (53.33 per cent) had medium level of participation in ATMA meetings.
8. In Kottayam district, 70 per cent of NGOs and private partners had medium level of participation. In Thiruvananthapuram district, 50 per cent of the respondents possess medium level of participation in ATMA, and 40 per cent fell under low level participation.
9. Results of the correlation studies in Kottayam district revealed that extension contact and extension participation had shown positive and significant association with perception about implementation of ATMA activities at 1 per cent probability. Economic motivation and Number of trainings undergone showed significant relationship with perception about implementation of ATMA activities at 5 per cent level whereas in Thiruvananthapuram, only age and economic motivation had shown positive and significant relationship with perception of farmers about ATMA implementation.
10. The analysis of the constraints faced by the farmers revealed that lack of coordination of line departments in providing service to the farmers was perceived as the most important constraint in both the districts. Rank correlation coefficient of 0.9 indicated that the constraints felt were more or less same in both the districts, though the intensity is less in Kottayam district.
11. Implementing officers in both districts differed in their rating of constraints towards ATMA functioning. In Thiruvananthapuram, lack of institutionalisation of ATMA is the major constraint perceived by the officers where as in Thiruvananthapuram, lack of single line of command appeared as the most important constraint.
12. Members of the decision making authorities such as GB, AMC and BFAC of the two districts rated lack of active participation of the stakeholders as

the major constraint in the implementation of ATMA programme. The second important constraint was the lack of synergy among the line departments.

13. NGOs and private partners involved in ATMA Kottayam felt that they were not much consulted before implementing the ATMA activities. They were not taken in to confidence by the Government agencies or Departments, which appeared to be the most important constraint as perceived by Thiruvananthapuram NGOs.
14. In order to further improve the functioning of ATMA 'assigning definite role and responsibility to the implementing officers' was first among the suggestions given by the officials in both the districts.

Thus, it can well be appreciated that the response to ATMA is promising in Kottayam district than Thiruvananthapuram district. The impact parameters shows that a positive change is slowly developing in both the districts. It is quite natural to presume that it will take some time for realizing the full potential of this *programm*. In course of time, the comprehensive institutional and operational reforms undertaken under ATMA programme is expected to show a discernible impact in improving the quality and type of technologies being disseminated by the extension system with due emphasis on diversification and intensification of different farming systems. In the ultimate analysis, it should enable the Research-Extension system to be more demand-driven and responsive in solving farmers' problems besides increasing the financial sustainability of the public extension system and developing new partnerships with private sector.

Future Lines of Research

:

1. A cross sectional study covering the entire Kerala State with reference to the impact of ATMA scheme has to be urgently undertaken.
2. The ATMA PLUS component is unique to Kerala State which can serve as a model to the other States if evaluated and found to be efficient as a gap filling and location-specific component.
3. Since ATMA scheme hinges to a large extent on Group based and farmer led extension, studies on the Social Capital Development dimension are urgently warranted

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APPENDICES

APPENDIX I



KERALA AGRICULTURAL UNIVERSITY
 College of Agriculture, Vellayani, Thiruvananthapuram. 695 522
DEPARTMENT OF AGRICULTURAL EXTENSION

Dr. G. S. Sreedaya
 Assistant Professor and Chairman

Date: 21/02/2014

Sir,

Greetings.

Sir/Madam,

Smt. Rubeena. A (Ad. No. 2012-11-133), one of the M.Sc. Scholar, Department of Agricultural Extension, College of Agriculture, Vellayani is undertaking a research study entitled **“Revitalization of Agricultural Technology Management Agency(ATMA): A comparative study in Thiruvananthapuram and Kottayam districts of Kerala”** as part of her PG research work.

The study aims at comparing the implementation of revitalized ATMA activities in Thiruvananthapuram and Kottayam districts with a view to suggest measures for further improvement.

Main items of observations to be made in the study are:

The perception about implementation of ATMA activities among various stakeholders specifically on the following key parameters

- Decentralised decision making
- Convergence of line departments
- Multi agency extension strategy
- Farming system approach
- Group approach (FOs& FIGs)
- Gender and equity concerns

- Sustainability of extension services
- Farmer-oriented activities, Farm Information Dissemination
- Research-Extension -Farmer Linkage.

After extensive review of the available literature and discussion with extension scientist's and other experts, variables supposed to have close association with the study have been identified.

Considering your vast experience and professional expertise you have been selected as a judge to rate the relevancy of the variables. I request you to kindly spare some of your valuable time for examining the questionnaire *critically*. Kindly return the list duly filled at the earliest.

Thanking you.

Yours sincerely

(Dr. G. S. Sreedaya)

Please rate the independent variables to be included in the study based on its relevancy from the most relevant to the least relevant by ticking against each variable under the respective rating scale.

LIST OF INDEPENDENT VARIABLES

(MR-Most Relevant, R-relevant, LR- Least Relevant)
(Kindly put \checkmark mark)

Profile characteristics of farmers				
Sl No	Variables	MR	R	LR
1.	Age :- (It refers to the chronological age of the respondents in completed years at the time of interview)			
2.	Educational status :- (refers to the level of formal education attained by the respondents)			
3	Occupational status :- (refers to the extent to which a respondent is occupied in agriculture)			
4	Family Type:- (refers to nuclear family or joint family)			
5	Sex:- (refers to the male and female beneficiaries in the study area)			
6	Annual income:- (It refers to the total income of all members of the family of the respondent from farming and other sources for a period of one year)			
7	Farming experience :- (refers to the total number of years the respondent has been engaged in farming.)			
8	Farm size :- (refers to the extent of area possessed by the respondent)			
9	Rural/ Urban background:- (Panchayat area/Municipal area/ Corporation area where the respondent resides.)			
10	Exposure to ATMA: - (No.of years of association with ATMA)			

Sl. No.	Variables	MR	R	LR
11	Innovativeness :- (Refers to the degree to which the respondent is relatively earlier in adopting new ideas.)			
12	Economic Motivation :- (refers to the extent to which a farmer is oriented towards profit maximisation and its relative value he places on monetary gains)			
13	Risk Orientation :- (refers to the degree to which the farmer is oriented towards encountering risk and uncertainty in adopting new ideas in farming)			
14	Cosmopoliteness :- (refers to the tendency of farmers to be in contact with outside village on the belief that all the needs of an individual cannot be satisfied within his own village.)			
15	Scientific Orientation :- (it is the degree to which a farmer is oriented to use scientific methods in farming).			
16	Social Participation :- (refers to the participation of individuals in various formal social institutions either as member or as an office bearer)			
17	Mass media exposure :- (refers to the extent to which farmer is exposed to different mass media channels.)			
18	Achievement Motivation :- (refers to the degree to which the farmer is oriented towards personal accomplishments))			
19	Extension Participation :- (refers to the extent of participation of respondents in different activities like meeting, training, demonstrations, exhibitions, seminars etc.)			

Sl. No.	Variables	MR	R	LR
20	Information source utilisation :- (refers to the source/sources from which the farmer respondent receives agricultural information and their relative frequency)			
21	Entrepreneurial behaviour:- (Persons with initiative, drive and hardwork)			
22	Self confidence:- (Refers to the belief of an individual in his or her abilities)			
23	Leadership propensity:- (refers to the ability of the respondent to influence others in the group for attainment of group goals)			
24	Level of Aspiration:- (the performance level of future attainment that the person sets himself to reach in some extent to gravitate towards his achievement.)			
25	Trainings received as apart of ATMA:- (refers to the type, number and duration of training in agriculture and related fields received by the respondents)			
Other variables , if any Please specify and explain				

Profile Characteristics of Implementing Officers

Sl. No.	Variable	MR	R	LR
1	Age: (It refers to the chronological age of the respondents in completed years at the time of interview)			
2	Sex:- (refers to the male and female beneficiaries in the study area)			

Sl. No.	Variables	MR	R	LR
3	Education Qualification:- (refers to the academic qualification possessed by the officer)			
4	Rural/ Urban background:- (Panchayat area/Municipal area/ Corporation area where the respondent resides.)			
5	Professional experience:- (refers to the total number of completed years of service as extension officer in the line department or in the other agencies of the related field.)			
6	Exposure to ATMA:- (No.of years of association with ATMA)			
7	Training undergone as a part of ATMA:- : (refers to the type, number and duration of training in agriculture and related fields received by the respondent)			
8	Achievement motivation : (Desire for excellence in order for an officer to work in his/her department)			
9	Exposure to internet and information technology:- (It refers to the extent to which the officer is using the support of internet and IT for developing his /her knowledge and skills for the benefit of his/her profession)			
10	Job environment:- (refers to the atmosphere for an official to work in his/her department)			
11	Job relationship: - (Refers to his/ her relationship with superiors, coworkers, subordinates and the clientele)			
13	Decision making ability:- (refers to the involvement of the extension personnel in generation of ideas, evaluation of options and making choice from among options)			
14	Level of Aspiration :- (refers to the performance level of future attainment that the person sets himself to reach in some extent to gravitate towards his achievement)			

Sl. No.	Variables	MR	R	LR
15	Facility and resources:- (refers to adequate provision of facilities and resources to extension personnel for the efficient functioning of his job activities.)			
	Other variables , if any Please specify and explain			

Profile characteristics of NGOs, members of decision making authorities

Sl No	Variables	MR	R	LR
1	Age of the institution:- (no.of years passed after the inception of the institution)			
2	Active period of the institution:- (operationally defined as the no. of years the particular institution is dynamic in the area of its work)			
3	Total no.of members: total no. of members working in the institution.			
4	Service of the respondent: (experience of the respondent in terms of no.of years of service within the institution)			
5	Education Qualification:- (refers to the academic qualification possessed by the respondent)			

Sl. No.	Variables	MR	R	LR
7	Trainings undergone as a part of ATMA: (refers to the number of trainings in agriculture and related fields received by the respondent)			
8	Trainings given by the institution to the stakeholders:- (refers to the type, number and duration of training in agriculture and related fields organised by the institution to the stakeholders as a part of ATMA)			
9	Area of work :- (refers to the major activities of institution undertaken in the field of agriculture and allied fields)			
10	Extent of participation in ATMA:- (in terms of participation of the institution in the decision making authorities and in the different platforms of ATMA)			
	Other variables , if any Please specify and explain			

Signature:

Name:

Designation:

Thankyou.....

APPENDIX- II

Independent Variables selected for the Study

Sl. No.	Name of Variable	Scores*
Farmers		
1	Age	68
2	Annual income	70
3	Educational status	79
4	Farm size	85
5	Economic motivation	79
6	Farming experience	70
7	Innovativeness	69
8	Risk orientation	82
9	Extension contact	85
10	Extension participation	81
11	Number of trainings undergone as a part of ATMA	77
12	Mass media exposure	72
Implementing Officers		
1	Number of trainings undergone as a part of ATMA	77
2	Job satisfaction	73
Members of Decision making authorities		
1	Frequency of participation in ATMA meetings	77
NGOs and Private Partners		
1	Extent of Participation in ATMA Activities	79

*Maximum score = 90(100%) Score at 75%= 67.5

APPENDIX - III**KERALA AGRICULTURAL UNIVERSITY**

College of Agriculture, Vellayani

Department of Agricultural Extension

Revitalization of Agricultural Technology Management Agency (ATMA): A comparative study in Thiruvananthapuram and Kottayam districts of Kerala.

Interview schedule for farmers

District	Block
Panchayat	Krishibhavan
Name of farmer	Address

1. Age**2. Annual income (Rs.)****3. Educational status**

Sl No.	Category	(√)
1	Illiterate	
2	Write and read	
3	Primary education	
4	High school	
5	Higher secondary	
6	College education	

4. Farm size (in acres)**5. Economic motivation**

Please indicate your extent of agreement towards the following statements(SA-Strongly Agree, A-Agree, UD-Undecided, DA-Disagree, SDA-Strongly Disagree)

Sl No.	Statement	SA	A	UD	DA	SDA
1	A farmer should work for higher yield and economic returns					
2	A farmer should try any new farming idea which may resulting in maximum income					
3	A farmer should grow cash crops to increase monetary profit in comparison to growing of food crops for home consumption					

6. Farming Experience (in years)

7. Innovativeness

Please give your degree of agreement about each of the following statements

Sl No.	Statement	SA	A	U D	D A	SD A
1	I feel restless till I try a new farming practice I have heard about.					
2	I am cautious about trying new practices.					
3	I try to keep myself update with information on new farm practices.					
4	I would like to adopt an improved practice after I had seen other farmers tried successfully in the farm					
5	I believe that the traditional ways of farming are the best.					

8. Risk orientation

Please give your degree of agreement about each of the following statements

Sl No.	Statement	SA	A	UD	DA	SDA
1	A farmer should grow a large number of crops to avoid greater risks involved in growing one or two crops					
2	A farmer should take more of a change in making a big profit than to be content with smaller but less risky profit					
3	A farmer who is willing to take greater risk than the average farmer usually does it better financially					
4	It is good for a farmer to take risk when he knows his chance of success is fairly high.					
5	It is better for a farmer not to try a new farming method unless most other have used it with success					
6	Trying an entirely new method for a farmer involves greater risks but it worths					

9. Extension contact

Sl No	Category	Regularly	Occasion ally	Never
1	Field Assistant			
2	Agricultural Assistant			
3	Agricultural Officer			
4	Block Technology Manager			
5	Assistant Director of Agriculture			
6	Project Director ATMA			

10. Extension participation

Sl No.	Activities	Regularly	Occasio nally	Never
1	Exposure visit			
2	Trainings			
3	Farm school			
4	Demonstrations			

11. Number of Trainings undergone as part of ATMA**12. Mass media exposure**

Please indicate which are the following mass media you use for getting information and frequency of exposure.

Sl No.	Sources	Frequency		
		Regularly	Occasionally	Never
1	Television			
2	Radio			
3	Newspaper			
4	Magazine			
5	Bulletin			

13. Perception about the implementation of ATMA activities

(E-Excellent, G-Good, M-Moderate, P-Poor)

Sl. No.	Statements	E	G	M	P
1	The extent to which ATMA activities are decided in a decentralized manner by involving more participation of beneficiaries				
2	Convergence of the line departments such as the Department of Agriculture, Animal Husbandry, Dairy Department and Fisheries under ATMA setup.				
3	Involvement of private partners and NGOs in ATMA				
4	Promotion and support to ATMA groups such as FIG/CIG/FOs etc.				

Sl. No.	Statements	E	G	M	B
5	Farming system approach in which integration of crops, livestock and fisheries to ensure farmer to gain maximum returns.				
6	Addressing the gender and equity concerns by formulating strategies for better access of extension services for women.				
7	Achievement of Sustainability of extension service by way of cost sharing				
8	Usefulness of farmer oriented activities such as exposure visits, trainings, demonstrations etc.				
9	The span of farm information disseminations through leaflets, bulletins, exhibitions etc.				
10	Organizing researcher, extension officer, farmer interfaces.				

14. Whether crop yield has increased after ATMA interventions?

Yes/No

Productivity

Sl No.	Crops	Yield before ATMA	After ATMA
1	Coconut		
2	Paddy		
3	Banana		
4	Vegetables		

15. Connectivity (G-good, M-moderate, B-bad)

Sl No.	Items	G	M	B
1	Farmer-official			
2	Farmer-market			
3	Officer-scientist			
4	Among members of ATMA groups			
5	Between ATMA groups			

16. Resilience

Which of the following you have adopted after exposure to ATMA? Please put (√) mark.

Sl No.	Items	
1	Multiple cropping	
2	Integrated farming	
3	Value addition	

17. Constraints perceived by farmers ATMA

Please tick the appropriate (MI-Most Important, I-Important, LI-less important)

Sl No.	Constraints	MI	I	LI
1	Lack of coordination of line departments in providing service to the farmers			
2	Bias in selecting the beneficiaries			
3	Lack of support to ATMA groups			
4	ATMA activities are not demand driven			
5	Lack of usefulness of farmer oriented activities such as trainings, exposure visit, demonstrations etc.			

18. Suggestions for the improvement of ATMA scheme

Sl No.	Suggestions	MI	I	LI
1	Regular monitoring of ATMA activities			
2	Beneficiaries should be identified by gramasabha			
3	Farmers should be consulted before planning farmer oriented activities such as training, exposure visit etc.			
	Any other			

Signature

THANK YOU

KERALA AGRICULTURAL UNIVERSITY

College of Agriculture, Vellayani

Department of Agricultural Extension

Revitalization of Agricultural Technology Management Agency (ATMA): A comparative study in Thiruvananthapuram and Kottayam districts of Kerala.

Interview schedule for Implementing Officers of ATMA

1. Name

2. Designation

3. Trainings undergone as a part of ATMA

Name of the training attended.
1.
2.
3
4

Total number of trainings attended as a part of ATMA :-

4. Job satisfaction

Please indicate your response by putting mark in the appropriate column against each statement VMS: very much satisfied, S: satisfied, DS: dissatisfied

Sl no	Statement	VM S	S	DS
1	How much satisfied you are- with the flexibility given by superiors to do your job well			
2	With the working facilities that you have to do your job well			
3	With the opportunities provided in your job to utilise your personal abilities			
4	With the work you are doing as extension personnel			

5	With the recognition gives to your work by the people of your area			
6	What is the span of your satisfaction with relationship among internal and external public?			
7	What is the range of your satisfaction with technical guidance and support of higher-ups			
8	With the policies and practices of the department in relation to your work			
9	With the job authority delegated to you in order to do your job			
10	When you considered the expectations you had when you took up this.			
11	With the relation you have with your superior in your work.			

5. Perception about the implementation of ATMA activities

(E- Excellent, G-Good, M-Moderate, P-Poor)

	Statement	E	G	M	P
1	The extent to which ATMA activities are decided in a decentralized manner.				
2	Convergence of the line departments such as the Department of Agriculture, Animal Husbandry, Dairy Department and Fisheries under ATMA setup.				
3	Involvement of private sector and NGOs in ATMA activities				
4	Promotion and support to ATMA groups such as FIG/CIG/FOs etc.				
5	Farming system approach in which integration of crops, livestock and fisheries to ensure farmer to gain maximum returns.				
6	Addressing the gender and equity issues				
7	Achievement of Sustainability of extension service				
8	Usefulness of farmer oriented activities such as exposure visits, trainings, demonstrations etc.				
9	The span of farm information disseminations through leaflets, bulletins, exhibitions etc.				
10	Organizing researcher, extension officer, farmer interfaces.				

6. Constraints perceived by implementing officials

		Most important	important	Less important
1	Lack of single line of command			
2	Compartmentalisation of different stakeholders			
3	lack of institutionalisation			
4	Inconsistency of contract staff			
5	Please specify if any			

7. Suggestions for improvement of ATMA

		Most important	important	Less important
1	Definite role and responsibility should be given to the implementing officers			
2	Regular monitoring and evaluation of activities of implementing officers			
3	Inclusion of mainstream officials of the department in to ATMA			
4	Please specify if any			

Signature

Thankyou.....

KERALA AGRICULTURAL UNIVERSITY

College of Agriculture, Vellayani

Department of Agricultural Extension

Revitalization of Agricultural Technology Management Agency (ATMA): A comparative study in Thiruvananthapuram and Kottayam districts of Kerala.

Interview schedule for members of the decision making authorities

Name

District, Block

1.Frequency of participation in ATMA meetings (GB/AMC/BFAC)

Regularly/Occasionally/Never

2.Perception about the implementation of ATMA activities

(E- Excellent, G-Good, M-Moderate, P-Poor)

Sl. No.	Statement	E	G	M	P
1	The extent to which ATMA activities are decided in a decentralized manner.				
2	Convergence of the line departments such as the Department of Agriculture, Animal Husbandry, Dairy Department and Fisheries under ATMA setup.				
3	Involvement of private partners and NGOs in ATMA				
4	Promotion and support to ATMA groups such as FIG/CIG/FOs etc.				
5	Farming system approach in which integration of crops, livestock and fisheries to ensure farmer to gain maximum returns.				
6	Addressing the gender and equity issues				
7	Achievement of Sustainability of extension service				

Sl. No.	Statements	E	G	M	B
8	Usefulness of farmer oriented activities such as exposure visits, trainings, demonstrations etc.				
9	The span of farm information disseminations through leaflets, bulletins, exhibitions etc.				
10	Organizing researcher, extension officer, farmer interfaces.				

3. Constraints perceived in ATMA

Sl. No.	Constraints	MI	I	LI
1	Lack of active participation from the members			
2	Lack of inter departmental coordination			
3	Implementation of ATMA activities are deviating from the actual plans			
4	Bias in the selection of farmer representatives			
	If any			

4. Suggestions for improvement

Sl. No.	Suggestions	MI	I	LI
1	Participation of different stakeholders should be ensured			
2	Utilise the full potential of BFAC to make ATMA programmes more demand driven			
3	Selection of farmer representatives should stick to the norms			
	If any			

Signature

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Revitalization of Agricultural Technology Management Agency (ATMA): A comparative study in Thiruvananthapuram and Kottayam districts of Kerala.

Interview schedule for NGOs and private partners

Name:

District:

1. The Extent of Participation in ATMA Activities

(GB-Governing Body, AMC-ATMA Management Committee)

Sl. No.	Items	Regularly	Occasionally	Never
1	Participation in ATMA meetings (GB/AMC)			
2	Coordination with ATMA for formation of farmers groups			
3	Coordination with ATMA for organization of demonstrations, trainings, farm schools etc. for farmers			

2. Perception about the implementation of ATMA activities

(E-Excellent, G-Good, M-Moderate, P-Poor)

Sl.No	Statements	E	G	M	P
1	The extent to which ATMA activities are decided in a decentralized manner by involving more participation of beneficiaries				
2	Convergence of the line departments such as the Department of Agriculture, Animal Husbandry, Dairy Department and Fisheries under ATMA setup.				
3	Involvement of private partners and NGOs in ATMA				
4	Promotion and support to ATMA groups such as FIG/CIG/FOs etc.				
5	Farming system approach in which integration of crops, livestock and fisheries to ensure farmer to gain maximum returns.				
6	Addressing the gender and equity concerns by formulating strategies for better access of extension services for women.				
7	Achievement of Sustainability of extension service by way of cost sharing				
8	Usefulness of farmer oriented activities such as exposure visits, trainings, demonstrations etc.				
9	The span of farm information disseminations through leaflets, bulletins, exhibitions etc.				
10	Organizing researcher, extension officer, farmer interfaces.				



3. Constraints perceived in ATMA

(Please choose the appropriate one MI-most important, I-Important, LI-Least important)

Sl.No.	Constraints	MI	I	LI
1	Potential of NGOs is not at all utilized in ATMA			
2	NGOs are not consulted before implementing the activities			
3	NGOs are no at all taken in to confidence by other stakeholders			
	If any.			

4. Suggestions for improvement of ATMA

Sl. No.	Suggestions	MI	I	LI
1	NGOs and private partners must be included while preparing SREP, BAP.			
2	Conducting demonstration plots, trainings, forming farmer groups etc. must be allotted for NGOs also.			
	Suggestions if any			

Signature

**Revitalization of Agricultural Technology Management Agency(ATMA): A
comparative study in Thiruvananthapuram and Kottayam districts of
Kerala**

by

RUBEENA. A.

(2012 - 11 - 133)

ABSTRACT

of the thesis

**Submitted in partial fulfilment of the
requirements for the degree of**

MASTER OF SCIENCE IN AGRICULTURE

Faculty of Agriculture

Kerala Agricultural University



**DEPARTMENT OF AGRICULTURAL EXTENSION
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VELLAYANI, THIRUVANANTHAPURAM - 695 522
KERALA, INDIA**

2015

ABSTRACT

The present study entitled “Revitalization of Agricultural Technology Management Agency (ATMA): A comparative study in Thiruvananthapuram and Kottayam districts of Kerala” was carried out at the Department of Agricultural Extension, College of Agriculture, Vellayani. The study aimed at comparing the implementation of revitalized ATMA activities in Thiruvananthapuram and Kottayam districts with a view to suggest measures for further improvement.

Since the study is participatory with multi-stakeholder involvement, four classes of stakeholders of ATMA were chosen as respondents namely implementing officials, members of decision making authorities, farmers and NGO and private partners from each district. Multistage random sampling was employed for the study.

On analysis of data, it was found that for each category of respondents, the perception about the implementation of ATMA activities was highly positive and significantly higher in Kottayam district than that in Thiruvananthapuram district. Perception about implementation of ATMA was measured in terms of ten dimensions and it was found that almost all dimensions are found to be positive and significantly higher in Kottayam district than in Thiruvananthapuram district.

Regarding impact parameters, around 50 per cent farmer respondents expressed that ‘productivity’ of banana and vegetable showed 26-50 per cent improvement in both the districts after exposure to ATMA. ‘Connectivity’ among the farmers has improved as a result of their participation in farmer oriented activities such as exposure visits, trainings, demonstrations and farm schools in both the districts.

The profile characteristics of farmers such as economic motivation, extension contact, extension participation, number of trainings undergone showed positive and significant association with perception about the implementation of ATMA in Kottayam district whereas in Thiruvananthapuram district, age and economic motivation were associated significantly to the dependent variable.

The farmers of both the districts felt that 'lack of coordination of line departments in providing service to the farmers' was the major constraint in the implementation of ATMA. Assigning definite role and responsibility to the implementing officers' was the most important suggestion of officials in both the districts. 'ATMA activities are to be planned in consultation with farmers' and 'need of regular monitoring of ATMA' were the most important suggestions made by the farmers of Kottayam and Thiruvananthapuram districts, respectively.

ATMA should enable the Research and Extension systems to become more dynamic and responsive to solving farmers' problems. Besides increasing the financial sustainability of the public extension system, new partnerships with private sector and better coordination among the line departments must also be fostered to ensure that the agricultural sector becomes vibrant and innovation-driven.

