

# Agricultural Extension Systems in Tripura

Working paper 1

MANAGE Centre for Agricultural Extension Innovations,  
Reforms and Agripreneurship



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## About the publication

This working paper is the result of a field study conducted in Tripura state during January, 2017 and is based on the observations of and the interactions with officials from different extension stakeholders in the state in agriculture and allied sectors.

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## Disclaimer

The views expressed in the document are not necessarily those of MANAGE or officials with whom the authors interacted but are of the authors' own based on the interactions and observations during the field study conducted in Tripura and discussions held during Multi-Stakeholder Consultative Workshop on 'Agricultural Extension Systems in Tripura' at Agartala.

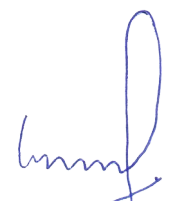
## Foreword



**Smt. V. Usha Rani, IAS**  
Director General, MANAGE

MANAGE is the Indian response to challenges of agricultural extension in the rapidly growing and diverse agriculture sector. With the policies of liberalization and globalization of the economy and the level of agricultural technology becoming more sophisticated and complex, major initiatives were called for towards reorientation and modernization of the agricultural extension system. Effective ways of managing the extension system needed to be evolved and extension organizations empowered to transform the existing set up through professional guidance and training of critical manpower is essential. MANAGE is the decisive response to this imperative need and in the last 30 years has established itself as a unique institution in the field of agricultural extension management.

MANAGE proposed to bring a working paper on Agricultural Extension Systems across the states of India and initiated the efforts with a scoping study in Tripura. In an agrarian economy like Tripura, supporting the farmers with better extension services will ensure a holistic economic and social development in the state. In this regard, a scoping study was conducted in January 2017, to understand the current status of the extension systems in the state. As a follow-up activity, a Multi-Stakeholder Consultative Workshop was conducted to understand their perspective on the current status of extension system and involvement of MANAGE in terms of capacity development of the extensionists from agriculture and allied sectors. Based on the discussions, a set of recommendations were indicated with the goal of making stronger extension systems for agricultural development in Tripura.



(V. Usha Rani)

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## Abbreviations

AC&ABC	Agri Clinics and Agri Business Centres
ATM	Assistant Technology Manager
ATMA	Agricultural Technology Management Agency
BRGF	Backwards Region Grants Fund
BTM	Block Technology Manager
BTT	Block Technology Team
CoA	College of Agriculture
CoF	College of Fisheries
CSS	Centrally Sponsored Scheme
DDF	Deputy Director of Fisheries
DoA	Department of Agriculture
DoF	Department of Fisheries
DoH&SC	Department of Horticulture and Soil Conservation
FA	Fisheries Assistant
FO	Fisheries Officer
GP	Gram Panchayat
HRS	Horticulture Research Station
HYV	High Yielding variety
ICAR	Indian Council of Agricultural Research
ICT	Information and Communication Technology
IWMP	Integrated Watershed Management Programme
JDF	Joint Director of Fisheries
KCC	Kisan Call Centre
KVK	Krishi Vigyan Kendra
MANAGE	National Institute of Agricultural Extension Management
MIDH	Mission for Integrated Development of Horticulture
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MSME	Ministry of Micro, Small and Medium Enterprises
NABARD	National Bank for Agriculture and Rural Development
NFDB	National Fisheries Development Board
NFSM	National food Security Mission
NMOOP	National Mission on Oilseeds and Oilpalm
NMSA	National Mission for sustainable Agriculture
NTI	Nodal Training Institute
T-SAMETI	Tripura State Agricultural Management and Extension Training Institute
PMFBY	Pradhan Mantri Fasal Bima Yojana

PMKSY	Pradhan Mantri Krishi Sinchayee Yojana
ARD	Animal Resource Development
ARDD	Animal Resource Development Department
B2B	Business to Business
B2C	Business to Consumer
BLBH	Block Level Brooder House
DDA	Deputy Director of Agriculture
FLD	Front Line Demonstration
GPS	Global Positioning System
HBDP	High Density Bamboo Plantation
IL&FS	Infrastructure Leasing and Financial Services Ltd.
IGA	Income Generating Activity
IGDC	Indo German Development Corporation
INR	Indian Rupees
ITC	Indian Tobacco Company
JFMC	Joint Forest Management Committee
JICA	Japan International Cooperation Agency
MSE	Micro and Small Enterprise
NEC	North Eastern Council
NEHHDC	North Eastern Handicrafts and Handloom Development Corporation
NGO	Non-Government Organization
OFT	On Farm Trial
PD	Project Director
PSU	Public Sector Undertaking
RAWE	Rural Agricultural Work Experience
RKVY	Rashtriya Krishi Vikas Yojana
RoFR	Recognition of Forest Rights
SA	Superintendent of Agriculture
SARS	State Agricultural Research Station
SF	Superintendent of Fisheries
SHG	Self Help Group
SRI	System of Rice Intensification
ToT	Transfer of Technology
TPS	True potato Seed
TTAADC	Tripura Tribal Areas Autonomous District Council
UGTC	Upgraded Gram Sevak Training Centre
VLW	Village Level Worker

## Acknowledgements

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## Executive Summary

Extension is the only active link between research and development, and the farmers. In an agrarian economy like Tripura, where majority of the farmers are either marginal or small land holders, extension become the most important component in agriculture and allied sector. And for that reason, MANAGE has taken the initiative to adopt the state and work with extension stakeholders to transform the extension system and make it a model for other states of the country. In this regard, a scoping study was conducted in the state to understand the working of the extension stakeholders of the state and decide further interventions required from MANAGE and other stakeholders. A follow-up Multi-Stakeholder Consultative Workshop on Agricultural Extension Systems in Tripura, held at Agartala on 30 and 31 May 2017, also helped add further information to the document.

The major stakeholders in extension in agriculture and allied sector are the Department of Agriculture; College of Agriculture, Tripura; Department of Horticulture; Department of Fisheries; College of Fisheries, Central Agricultural University (CAU), Lembucherra; Animal Resource Development Department (ARDD); Department of Forestry; Rubber Board, Regional Office, Tripura; Tripura Forest Development and Plantation Corporation Ltd. (TFDPC); Tripura Bamboo Mission (TBM); Indian Council of Agricultural Research (ICAR), Tripura Centre; Krishi Vigyan Kendra (KVK); Tripura State Agriculture Management and Extension Training Institute (T-SAMETI); Agricultural Technology Management Agency (ATMA); National Bank For Agriculture and Rural Development (NABARD); the media (radio, TV, newspapers); input dealers; NGOs and Panchayat T-SAMETI.

Every stakeholder has some unique feature in the extension system. While the Department of Agriculture, Horticulture, Fisheries and ARDD was more production oriented, forestry and plantation sector was market oriented. Community extension was the important feature of forestry and plantation sector, whereas it is non-existent in other sectors. Capacity development was limited to few training, demonstrations, and exposure visits. Market led extension is yet to come up in a big way in the state.

The major recommendations that came up from the study were:

1. Skill development of the extension workers with focus on both the technical and functional skills.
2. Digitalization is the need of the hour and there should be an increased focus on ICT skills of the extension professionals.
3. Documentation of many of the innovations has not been done because of either lack of documentation skills of the officials or lack of awareness about its importance. While the state Govt. can put more emphasis on documentation of innovations and good practices, writeshops can enhance the documentation skills.
4. Online monitoring can reduce the heavy workload on field officials as well as makes the system more transparent. NIC/IT firms can be engaged to create online monitoring systems for easy upload of resource materials, for better archiving and retrieving.
5. A dedicated extension mechanism is required in the state for higher effectiveness and encouraging community extension or para-extension workers can be an effective way.

6. Beneficiary selection under different projects across different sectors, are many a times not transparent and creation of a model village database for each village with all details of the residents will help in making the process transparent.
7. Market led agriculture needs to come up in a bigger way in the state, especially for agriculture, horticulture, fisheries and animal resource development (ARD) sector. Institutional mechanisms are needed to create awareness and in linking with the right market players.
8. Extension research in the state is non-existent which limits formulation of proper policies for the same. Extension and, research and development institutions can play an important role in partnering with different stakeholders and take up projects in the state for in-depth analysis of the current scenario and come out with solid recommendations.
9. There has been no recruitment in the state under ATMA, increasing the burden on the state department officials. State Govt. can partner with NGOs to take care of the recruitment of contractual employees under the convergence fund to avoid issues related to employment or salary.
10. Convergence is non-existent in the state between departments and T-SAMETI can play an active role in brokering strong linkages among the actors in the state and introduce the concept of farming as a commercial enterprise.
11. The state has enormous untapped potential in high value crops and Farmer Producer Organizations (FPOs) can tap into this, by transforming farming to commercial business and increase their income manifolds.
12. Agripreneurship and agricultural start-ups needs to be encouraged by the Govt. and as T-SAMETI is already recognized as a Nodal Training Institute under Agri Clinics & Agri Business Centres (AC&ABC) Scheme of Government of India implemented by MANAGE, it can take an active role in mobilizing people, especially youth.
13. A unique initiative by the Department of Fisheries was observed in categorizing farmers based on their productivity/performance rather than the size of pond they own. Similar initiative can also be taken by the DoA, to ensure a systematic and effective distribution of technology, subsidies and incentives.
14. Appropriate stakeholders (ICAR institutions, colleges, MANAGE, EEI and T-SAMETI) can organize refresher training programs for department officials, as many of them expressed to have lost touch with recent developments in their respective fields due to heavy administrative work load. Recent technologies and skills can be introduced while reinforcing the basics to increase the competence of the extension staff.

## Introduction

MANAGE was established in 1987, as the National Centre for Management of Agricultural Extension at Hyderabad, by the Ministry of Agriculture & Farmers Welfare, Government of India as an autonomous Institute, from which its acronym 'MANAGE' is derived. In recognition of its importance and expansion of activities all over the country, its status was elevated to that of a National Institute in 1992 and re-christened to its present name i.e., National Institute of Agricultural Extension Management. MANAGE is the Indian response to challenges of agricultural extension in a rapidly growing and diverse agriculture sector. The policies of liberalization and globalization of the economy and the level of agricultural technology becoming more sophisticated and complex, called for major initiatives towards reorientation and modernization of the agricultural extension system. Effective ways of managing the extension system needed to be evolved and extension organizations enabled to transform the existing set up through professional guidance and training of critical manpower. MANAGE is the response to this imperative need. Professional services provided by MANAGE are management training, consultancy, management education, research, and knowledge management services. One of the mandates of MANAGE is 'developing and promoting application of modern management tools for improving the effectiveness of agricultural extension organizations' (<http://www.manage.gov.in/aboutUs/ourOrganization.asp>) and for that, MANAGE is proposing to adopt states to transform the extension systems in select states of India.

One of the states that has been adopted by MANAGE is Tripura, to promote the development of the North Eastern states of the country. North East provides a unique demographic and topographic feature and the challenges and the conditions are also different from rest of the country. This also makes the agriculture sector and its functioning different in many ways. To understand the existing conditions in agricultural and allied sectors in Tripura, the stakeholders in extension system, their working set-up, strengths and weaknesses were analysed with an initial scoping study conducted across the state and following discussions and deliberations in the Multi-Stakeholder Consultative Workshop on Agricultural extension Systems in Tripura conducted at Agartala on May 30-31, 2017.

## Tripura – An overview

Tripura is the third smallest state of the country and second smallest state in North East India, spread over 10,491 sq km, located precisely from 22°56'N to 24°32'N and 91°09'E to 92°20'E. The state is surrounded by Bangladesh in the west, north and south and Assam and Mizoram in northeast and east respectively. It is characterized by hill ranges, valleys, and plains and by tropical savannah climate. Lying within the Indomalaya eco-zone, Tripura hosts three different types of ecosystems: mountains, forests and freshwater ([www.tripura.gov.in](http://www.tripura.gov.in)).

Because of the socio-economic and topographical conditions, the economy of the state is largely agrarian and majority of the population is dependent on agricultural and allied activities. Agriculture is the primary sector contributing to about 64 per cent of the total employment in the state and 48 per cent of the State Domestic Product. Industrial sector is also mostly agro based depending on

rubber and tea. Various other horticultural crops like pineapple, orange, jackfruit, coconut, cashew are also grown in Tripura and provide an ample opportunity for commercialization (<http://tripura.gov.in/demographics>). Considering the area under agriculture and an economy dependent on it, and the need to focus on scientific methods of sustainable cultivation to increase productivity in agriculture and allied sectors, to promote scientific cultivation among farmers, thus making them more aware and efficient, and for promoting good agricultural practices, extension services plays a crucial role in the state.

## Stakeholders of extension in Tripura

Sl no.	Sector	Stakeholders
1	Agriculture	Department of Agriculture State Agricultural Research Station, Arundhatinagar College of Agriculture, Tripura
2	Horticulture	Department of Horticulture Horticulture Research Station, Nagicherra
3	Fisheries	Department of Fisheries College of Fisheries, CAU, Lembucherra
4	Animal Resource Development	Animal Resource Development Department (ARDD) College of Veterinary Sciences and Animal Husbandry, Tripura
5	Forestry and plantation	Department of Forestry Rubber Board Regional Office, Tripura Tripura Forest Development and Plantation Corporation Ltd. (TFDPC) Tripura Bamboo Mission (TBM)
6.	Research and capacity development	Indian Council of Agricultural Research (ICAR) for North east Hill Region, Tripura Centre Krishi Vigyan Kendra (KVK) Tripura State Agriculture Management and Extension Training Institute (T-SAMETI) Agricultural Technology Management Agency (ATMA)
7.	Finance and Rural Development	National Bank For Agriculture and Rural Development (NABARD)
8.	Grassroots institution	Panchayat Samiti (grassroots democratic institution)
9.	Media (print, TV, radio)	There are nor widely recognized extension stakeholders and were not contacted during the first phase of the research.
10.	Input dealers	
11.	Non-Government Organizations	

## Agriculture

Of the 10.49 lakh ha geographical area of the state, 59.99 per cent is under forest cover and another 13.93% per cent is not suitable for agricultural activities. About 1.18 per cent of land is under tree crops and permanent pastures and not included under net sown agricultural areas which is only 24.33 per cent of the total geographical area of the state. Cropping intensity of the state was 189 per cent in 2014-15 and is expected to increase to 190 per cent in 2016-17 with increased focus on irrigation. As of 2014-15, 1.14 lakh ha are has been brought under irrigation, of which assured irrigated is 87,000 ha (DoA, 2016).

### Set up

The Department of Agriculture (<http://agri.tripura.gov.in/>) is a major stakeholder in extension activities carried out in the agriculture sector. Because of the high priority set by the state government on the agriculture sector, the state has a separate agricultural set up from the revenue set up for efficient functioning. At present, there are 38 agri-subdivisions which will be increased to 58 to match the number of revenue blocks in the state. Director, Additional Director and the Joint Directors work at the state level, while the Deputy Directors are responsible for district level activities, Superintendents of Agriculture head the agri sub-divisions (revenue block) and Sector Officers are responsible for agri-sectors and agri assistants (Village Level Workers (VLWs) working at the agri-circles

As per the sanctioned set-up, one agri-circle is to consist of one Gram Panchayat (GP) and 10 Gram Panchayats will together make one agri-sector. Agri-subdivisions are equivalent to administrative blocks. While each agri-circle is headed by one VLW, one sector officer is to be the in-charge of each agri-sector. The sector officers are to report to the Superintendent of Agriculture.

In 1999, there were 38 blocks, 962 GPs, 704 VLW circles, 369 Agri input stores, and 69 agri sectors in the state. During restructuring of the administrative set up, number of districts increased from four to eight, number of blocks increased to 57 and the no of GPs is 1209 (including Village Councils in TTAADC areas) as of 2016-2017 but the number of agri-circles and agri sectors have not increased at the required rate in the state.

### Manpower

The department is limited in terms of manpower. Various positions in the DoA and their current status are mentioned below.

**Village Level Worker/Agri Assistant:** VLWs are the human resource of the department engaged at the grassroots in the state. The minimum educational level for the post is intermediate level. While the post is not a technical one, they have the highest interaction with the farmers. So to train them in various agricultural activities and methodologies, the state Govt. has established Upgraded Gram Sevak

Training Centres (UGTC) where they undergo two trainings in their career – one in the beginning and one in the middle as refresher training – of one year duration each. These training centres undertake about 40 trainings each year and play a very important role in development activities of agriculture, horticulture, and allied sectors in the state, as the quality of training provided by these centres, to a large extent, determine the quality of services provided by these grassroots level extension workers.

While the state has 1209 GP, there are only 700 VLWs, while as per plan, each VLW circle is to cover one GP. Also, the department has 384 subsidy stores at the GP level for distributing subsidized inputs and machineries to farmers throughout the year. While the plan was to have one store for two GPs, due to financial constraint, the number could not be increased. These stores are also manned by VLWs, which leaves only 316 VLWs throughout the state (roughly three-four GPs per VLW) to actively visit the farmers at the fields and address the issues arising. The VLWs also work as Assistant Technology Manager (ATM) for ATMA. Along with the regular duties, they also have to engage with census (both agricultural and human), elections, and other administrative duties increasing the work load and reducing efficiency at times.

**Sector officers:** Sector officers are also active at the village level and extension is a major part of their job. At present, there are 83 agri-sectors in the state, each comprising of around 15 GPs on an average. While the sector offices were sanctioned to serve 10-12 GP, due to constraint in manpower, each sector office is currently covering 18-20 GPs (Agriculture Road Map 2013-2017; pp-27). Since 2011, there has been no new recruitment of agricultural officers {recent advertisement (<http://www.tpsc.gov.in/2016/010716.pdf>) has been made for 50 posts but recruitment process is not over yet} and so the situation has not changed much. The sector officers are technical posts with minimum qualification of B.Sc. (Agri/Hort.). Currently, majority of the sector officer posts are held by agriculture graduates and since they are responsible for both agriculture and horticulture, and implementing the various schemes under different state and central programs takes up a major part of their workload. Other than that, different works under MGNREGA (like orchard preparation, land levelling for agricultural purposes, and so on), which is a Rural Development Project, is also carried out by the DoA and has to be looked after by the sector officers, because of limited human resource at the DoA. Other than that, the state has no recruitment under ATMA and the sector officers also carry out the duties of the Block Technology Manager. With multiple administrative duties to be performed, very little time is left for extension activities other than the regular training programmes and exhibitions for target achievement.

**Superintendents of Agriculture (SA):** The SAs are responsible for all the activities of the DoA at the sub-division level. Though the job description does not call for extension work, they are involved as resource persons in training programs for farmers. Along with that, the superintendents are also Block Technology Team (BTT) Convener in-charge for ATMA. At present, there are in total 37 posts of SA in the state, of which 29 are filled by Superintendents of Agriculture and the rest nine are Superintendents of Horticulture.

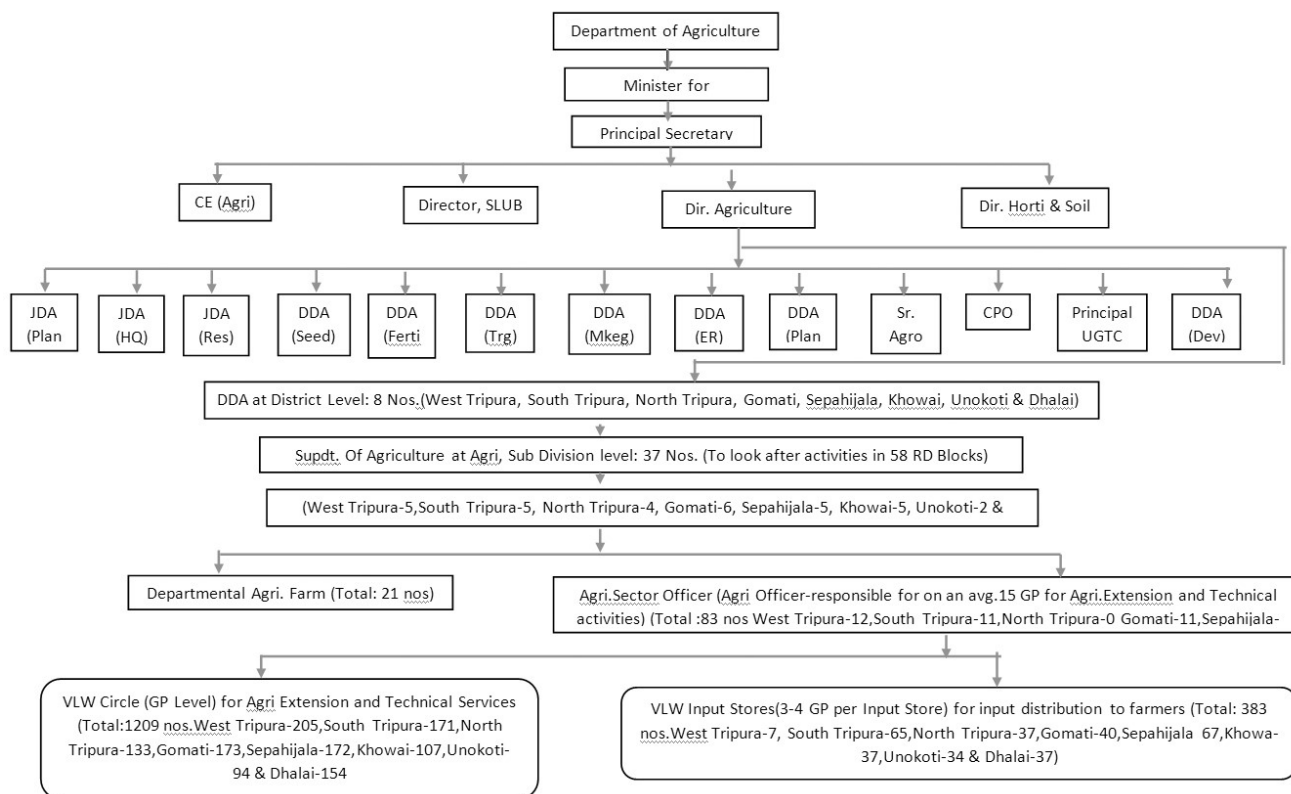


Fig. 1: Organizational set-up of Department of Agriculture

**College of Agriculture, Tripura:** With increased emphasis on agricultural education and promotion of scientific cultivation practices in the state, the College of Agriculture, Tripura, was established under the Perspective Plan in 2007. The college is yet to start post graduate courses because of faculty shortage. Extension activities are also limited to RAWE (Rural Agricultural Work Experience) programmes and a few field visits and demonstrations for farmers in collaboration with T-SAMETI. Also, because of lack of proper infrastructure and faculties and being only a graduate college as of now, there has been no significant contribution in terms of research yet. The State Agricultural Research Station (SARS), as of now, is the sole research wing for agriculture in the state (<http://www.coatripura.ac.in/frmHomePage.aspx>).

**State Agricultural Research Station (SARS):** SARS has been significant in terms of research in the state and being the sole research wing for the state other than ICAR, has a huge responsibility as well. It also has had significant contribution in terms of agronomic practices like System of Rice Intensification (SRI) dissemination, which have been successful in the state. The station conducts demonstration for farmers and VLWs, and helps them keep abreast with recent technological development. It also looks after the different research farms of the state at every sector, for seed production and other related research. But again, having the required number of competent manpower in the station and its research farms is a challenge (<http://agri.tripura.gov.in/reaserch.htm>).

## Performance of agriculture sector

Tripura is characterized by small and marginal farmers and 96 per cent of the farmers have land holding less than 2ha. Rice is the staple food and paddy is the major cereal grown in the state. But because of the



recent fall in prices and aberrant weather condition, there has been increased focus on crop diversification on rice fallows which accounts for 84,000 ha and 60,000 ha during pre-kharif and rabi seasons. But because of lack of irrigation facilities, winter vegetable production is yet to be taken up in the state. The KVKs and SARS are working on feasibility of lentil as a rabi crop in rice fallows and this is also being popularized by ATMA. Short duration paddy variety MTU 1010 is also being promoted to encourage the cultivation of pulses in the same land to reduce water use. While the area and production of food grains have increased by 10 per cent and 8 per cent respectively in 2015-16 over 2014-15, the productivity has reduced by

3 per cent. For pulses, area increase has been 89 per cent and production increase have been 68 per cent but productivity has fallen by 14 per cent (DoA, 2016; pp-9). SRI is being popularized in the state to realize the full benefits of modern rice varieties – both high yielding varieties (HYVs) and hybrids. As of 2015-16, 1,09,645 ha gross area is under SRI (both hybrid and HYV) which is 40.33 per cent of the gross area under paddy. There was a 90 per cent increase in bio-fertilizer distribution, 34 per cent increase in Soil Health Card (SHC) distribution, 11 per cent increase in Kisan Credit card (KCC) issued and 30 per cent increase in agricultural loan given in 2015-16 compared to 2014-15.

A major success of the DoA has been the promotion of SRI method of rice cultivation. The technology has taken up almost half of rice cultivation in the state and is gaining popularity among rice farmers. A major reason for the success has been the dissemination technique used by DoA. While convergence was observed with ICAR in the initial phases, GP's were greatly involved, making it a people's movement. Successful coordination among stakeholders like KVK's, DoA, GP's and ICAR, with the people at the grassroots (krishak bandhus and farmers) and policy support from the State, has worked together to make SRI the huge success it is. This has also become a lesson on how convergence can effectively increase the acceptability of a technology.

*(Suchiradipta and Saravanan, 2014 a,b,c; 2016)*

## Policies

Perspective Plan (2002-2012) has given considerable push to agricultural development in Tripura, followed by Agriculture Road Map (2013-2017). Major focus of the Perspective Plan was towards achieving self-sufficiency in food grain production, which was 5.13 lakh ton in 1999-2000 during initiation and has now increased to 8.12 lakh ton in 2015-16. Subsidies are provided to farmers under policies like State Plan, National Food Security Mission (NFSM), National Mission on Oilseed and Oilpalm (NMOOP), National Mission for Sustainable Agriculture (NMSA) and Rashtriya Krishi Vikas Yojana (RKVY). Pradhan Mantri Krishi Sinchai Yojana (PMKSY), Paramparagat Krishi Vikas Yojana (PKVY) and Mission Organic Value Chain, Pradhan Mantri Fasal Bima Yojana (PMFBY), etc., are focusing on technology transfer and awareness creation on related issues. The Action Plan 2016-17 has identified surplus food grain production, increased production of rice, maize, pulses and oilseed as major targets. Extension activities though have not been prominently focused in the plan document. Also, RKVY, NFSM, Mission for Integrated Development of Horticulture (MIDH), etc., Central Sector Schemes (CSS) and projects are the sole source of funding extension as the state revenue falls short to be effective to meet the requirements.



## Strengths

1. **Clearly structured organogram:** A clearly structured organogram (organizational structure, hierarchy, and roles and responsibilities) helps in efficient management of the extension system and clearly defined job descriptions helps maintain hierarchy in carrying out various activities. It also helps in easily identifying the lacunas and the monitoring and evaluation is easier because of the same.
2. **Independent set-up for agriculture:** A separate set up for agriculture in terms of operation depending on the agro-ecological factors instead of following the revenue set up, reflects the high priority in agriculture. The revenue set up for sub-division, sectors and villages are different to that of agriculture for effective performance. The interest of the government in agricultural development has also been a major cause for better performance of the sector.
3. **Early adopter farmers:** As expressed by the field officials, when presented with new technologies and provided the right incentives, farmers of the state have proven to be early adopters of these new technologies. This makes extension work easier but lack of infrastructure like irrigation and market facilities, and the lack of technological innovation, has not been able to utilize the situation fully.
4. **High potential for export:** The state produces export quality pineapple, jackfruit, flowers (gerbera, anthurium, orchids) and bamboo products. It is the highest producer of True Potato Seed (TPS) not only in the country but across the world (<http://horti.tripura.gov.in/HRC.html>).

## Challenges

1. **Limited agricultural land:** As discussed earlier, only 24 per cent area of the state is available for agriculture, though it is the backbone of the state's economy. Because expansion is not possible, modernization is the only way to increase production and productivity, but that is also happening slowly due to the lack of proper technological innovation and their dissemination in the state.
2. **Non-existent private extension:** There have been few feeble efforts to encourage private extension in the state. Public extension system is the sole extension provider in the state. Input dealers and educated youth could be trained to fill the manpower gap in extension but very few such initiatives are taken.
3. **Inadequate manpower:** To gain full manpower as planned, 418 VLWs (1,118-700=418) and 21 sector offices (58-37=21) sector offices are needed. While

A study on effectiveness of public agricultural extension services in Tripura found the intensity of extension contact with farmers in the state is only 1 hour 45 minutes/farmer/year, while technical manpower to cultivator ratio is 1:1,218. While extension service commitment and client accountability of the extension personnel was high, *organizational commitment, job satisfaction, job performance and job competence index of extension personnel was low*. Overall clientele satisfaction was 72.45 on a scale of 100. Increased technical manpower, collaboration with private actors, and organization of farmers into groups were some recommendations of the study.

*Debnath et al., (2016)*

the total requirement of VLW in the state is 1,118, current VLWs working in the field (excluding those in 384 VLW stores) is 316 which is about 28 per cent of the total requirement of VLWs. For sector officers, 36 per cent of the required manpower is currently filled. Also, with proposed increase in subsidy stores, that too manned by the VLWs, dedicated field level staff are required for sole extension purpose (Agriculture Road Map 2013-2017, pp-27).

4. **Lack of technical knowledge of field level staff:** VLWs are in closest contact with the farmers considering the sector officers with technical agricultural knowledge are more burdened with administrative work to actively contribute in the field. And being non-technical posts, the VLWs often lack the required knowledge for proposing solutions to farmers and advise them on matters other than the projects/schemes running for specific crops for which they are trained by the department. While with experience, many gain the knowledge, but many a times they are unable to identify or promote farmer innovations.
5. **Lack of documentation:** Farmer innovations are many but there has been very limited documentation of those to promote them as they are or after modifications. While some success stories for the primary project/programmes are collected and documented, majority of the indigenous grassroot innovations go undocumented because of lack of writing skills and/or time on the part of the VLWs and sector officers.
6. **Limited extension activities:** As a result of the years of on-going extension activities, farmers have become highly dependent on subsidies and extension officers only understand technology based extension (ToE). Innovations or reforms in extension are very few and also, priority to extension has mostly taken a backseat in policy documents as well.
7. **Quality human resource:** Majority of the extension personnel (higher, middle and lower level) are not abreast with any of the recent developments in extension or agriculture for that matter. Also, while there has been a drive for increased use of ICTs for extension, the human resource of DoA is quite poor in their use, which makes it hard to digitalize the information or activities of the department. Overall, quality of human resource is not adequate in the state, especially at the middle and lower level.
8. **Convergence:** Convergence of stakeholders in the state has been very low. While the departments in the agriculture and allied sectors work independently, there has also been no practical cooperation between ICAR, KVKs, or other stakeholders in the state. PRIs have been mandatorily involved at grassroot level extension work, but the involvement is limited to beneficiary selection, which is very often riddled with political influence and nepotism. Also, most of the time the Panchayat fails to identify the right beneficiary for the right kind of scheme because of their lack of technological knowledge of agriculture and the VLWs often do not have enough time to crosscheck, resulting in the subsidy going to unintended people while those who really need them get sidelined.
9. **Extension research:** Technology goes directly from lab to land without prior extension research about their suitability to farmers. Extension system only comes into picture for technology transfer but suitability or preference of farmers or consumers are not tested beforehand. For that reason alone, many technologies have failed in spite of their scientific merit. But because of the high workload for existing extension manpower, scope for such research is also very limited.
10. **Inadequate funds:** Revenue of the state mostly comes from agriculture, which is still fairly

traditional. Also, major source of funding for agriculture comes from the central government which is fluctuating most of the times. The state funds are not adequate to increase the manpower to form dedicated extension machinery for efficient functioning.

11. **Community extension:** There have been almost no community extension efforts in the state to deal with the manpower issue. While for some period 'Farmers Friend' was active in the state, especially during SRI popularization, the same has been discontinued. There is also lack of resource person to train lower level extension personnel regularly or encourage community based extension through achiever farmers or educated youth in the villages. While SHG formation has been prioritized by the government, no proper information is available on the current status of their functioning.
12. **Producer organizations:** Though many export quality, high value commercial crops (lentil, scented rice variety Harinarayan), are being produced in the state, they are being sold at low prices within the state markets itself because of lack of storage and proper marketing facilities (also hindered by lack of transportation). Few attempts have recently been taken up by NABARD but are their nascent stages only.

## Horticulture and Soil Conservation

### Set up and manpower

The Directorate of Horticulture and Soil Conservation, is under the Department of Agriculture and so the structure in manpower and set up is similar to that of agriculture. While the position of Director and Deputy Directors are different for Horticulture, at agri-subdivision level, the Superintendents of agriculture also look after horticulture and same goes for Sector officers and VLWs. Subsidies under different schemes are also distributed from the subsidy stores at agri circles headed by VLWs.

**Horticulture Research Station (HRS):** The HRS is the research wing of the Directorate of Horticulture and carries out both research and extension activities. The major objectives of the research station is introduction, acclimatization and evaluation of major plantation crops; establishment of germplasm bank for indigenous and exogenous horticultural crops for future research; and production of high quality planting materials (<http://horti.tripura.gov.in/HRC.html>). Standardization of profitable cultivation techniques of spices and flowers are also among the major activities of the station. The HRS has received accolades for its pioneering work in production of TPS. Regular extension activities like hands-on training of farmers on different techniques, demonstrations, focused group discussions, conducting field visits are also undertaken by HRS.

### Performance

The 10 year Perspective Plan (2002-2012) gave major boost to horticulture in the state. Doubling the production of fruits, nuts and vegetables and increasing production of spices and flowers were the main objective of the plan. At the end of the plan period, the total production target (12 lakh MT)

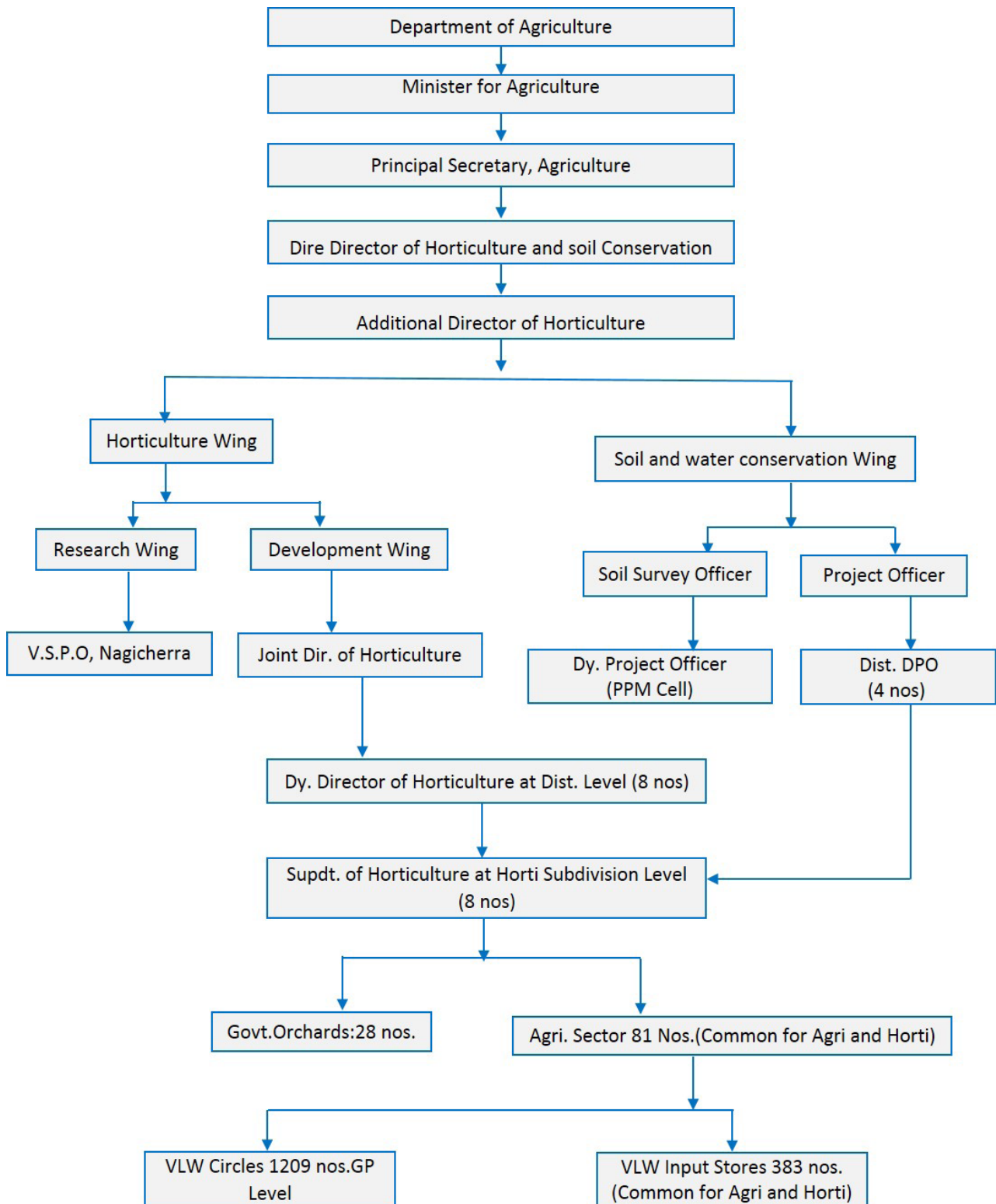


Fig. 2: Organogram of Department of Horticulture and Soil Conservation  
(source: <http://horti.tripura.gov.in/organisation.html>)

was exceeded substantially (13.86 lakh MT) with significant increase in productivity by 67 per cent, 76 per cent and 26 per cent in fruits, nuts and vegetables respectively (Annual Plan 214-15, DoH&SC; pp-1). Infrastructural constraints like lack of irrigation, marketing and processing facilities have been a hindrance to turning higher productivity into higher profit. Horticultural crops in agricultural fallows are grown only where irrigation channels are available and micro-irrigation could not be expanded much because marginal farmers mostly cannot bear the 50:50 ratio cost of installation. Marketing

and processing infrastructure are also not highly developed leading to post harvest losses and selling at cheap prices. Exotic flowers like gerbera, anthurium and orchids in green house and open field cultivation of marigold, gladiolus and tuberose have also been taken up in project mode since 2007-08. While 270 units are already functional, another 147 have been proposed with a budget outlay of INR 5 million per unit in 2015-16.

Post 2012, Action Plan 2013-2017 emphasized on supply of high quality planting material; high density plantation of fruit orchards; application of manures and fertilizers in fruit gardens; better management of old gardens, introduction of suitable horticultural crops in agricultural fallow lands; post-harvest management, processing and value addition; marketing tie-ups for traditional, exotic and jhum vegetables. Along with these, stabilization of the progress made under Perspective Plan is also a thrust area. While the performance during this period is still under review, under the extension and human resource development (HRD) component, training, demonstrations, farm schools, formation of Commodity Interest Groups (CIGs) and exposure visits were prioritized (Agriculture Road map 2013-17; pp-vii-x).

During 2010-11 to 2016-17, area under horticulture has increased nearly 5.8 per cent per annum and production grew by 3.8 per cent per annum.

## Policies

Central Sector Schemes like MIDH, Perspective Plan, Agriculture Road Map 2013-17, Integrated Watershed Development Programme (IWMP), RKVY, State Plan and MGNREGA are the policies and source of funding under which all the activities in horticultural development in the state are taken up. Total budget allocated under all the schemes for four years of horticultural development was Rs 36,933.26 lakh and of that, Rs 468.5 lakh, which is 1.26 per cent of the total fund, was allocated for extension purposes (Agriculture Road map 2013-17; pp-vii-x).

## Strengths

The strengths of the horticulture sector are similar to the agriculture sector with the added advantage of growing high quality commercial crops like Queen Variety of pineapple, khasi mandarin, jackfruit and litchi. Also highly profitable are beetle vines, banana orchards, coconut plantations and different types of flowers (gerbera, marigold, sunflower, anthurium, orchids, etc.). Mushroom cultivation is also gaining popularity in the state.

## Challenges

A huge shortage of technical manpower in the horticulture sector has been a major bottleneck in increasing awareness about it. Agricultural crops like paddy are largely popular among farmers due to tradition and suitability of the area. Also, because of multiple reasons like allocation of funds, familiarity

and infrastructure availability, popularization of horticultural crops has not been as enthusiastic as in agriculture. Moreover, since majority of the staff are specialized in agriculture, horticulture takes a backseat. Required efficiency and competence level of the existing manpower is also not adequate.

Commercialization of high density planting system in potential fruit crops or green house technologies for high value fruits is yet to be popularized. Skill development on improved production system and management has also not been to a satisfactory level.

With lack of marketing and processing facilities, adequate efforts in training the small producers in processing of fruits and vegetables to increase their shelf life and reduce post-harvest losses has also not happened. Lack of proper storage and marketing facilities have also added to the woes.

Also, owing to the high commercial value of horticultural crops, creation of producer organizations would have helped the farmers realize maximum profit for their fields but the opportunities have not been leveraged well enough.

Other than that, the horticulture sector is also plagued by the same challenges as the agriculture sector.

## Fisheries

Total water area of 33,217.46 ha (3.20% of the total area) was available for fish cultivation in the state in 2014-15. While 23.49 per cent was under open fisheries, 76.51 per cent was under culture fisheries. Since the water area mapping is sometimes difficult due to irregularly shaped water bodies, the State Govt. is now using GPS tracking to map them. Fishery is identified as one of the priority sectors in the state, not only to increase income but also to ensure nutrition security of the rural people of the state.

### Set up

The Department of Fisheries (DoF) (<http://fisheries.tripura.gov.in/>) works independently under the Minister of Fisheries, with the Special Secretary cum Director looking after the activities at the state level. Joint Director (JDF) and Deputy Directors (DDF) work at the district level, Superintendents of Fishery (SF) are at the sub-division level, Fishery officers (FO) are deputed at block level and Fishery assistants (FA) are at the GP or Circle level. The set up for the fishery sector is also similar to that of agriculture.

### Manpower

Technical manpower is deficit in the fisheries department as well. Both the posts of Additional and Joint Director are vacant (sanctioned posts are 1 each). For SF, 14 posts are vacant against the sanctioned 29. Of the 123 sanctioned posts of Fishery Officers at block level, 29 are vacant. Fishery Inspectors, work at GP level and of the 71 sanctioned posts, 19 are currently vacant. For FAs at the



GP level, 139 posts are vacant against the 387 sanctioned to look after 1,118 GPs. Other than that, many administrative posts are also vacant in the state and this also increases the workload of the SFs, FOs, and FAs, giving lesser time for interaction with farmers.

College of Fisheries (CoF), Central Agricultural University (<http://cofcau.nic.in/>): DoF has no research wing of its own like Agriculture or Horticulture and depends on the ingenuity of its field staff to a large extent and CoF to some extent for required technological support. Laboratory supports as well as technical help are also taken from CoF as and when required by the department.

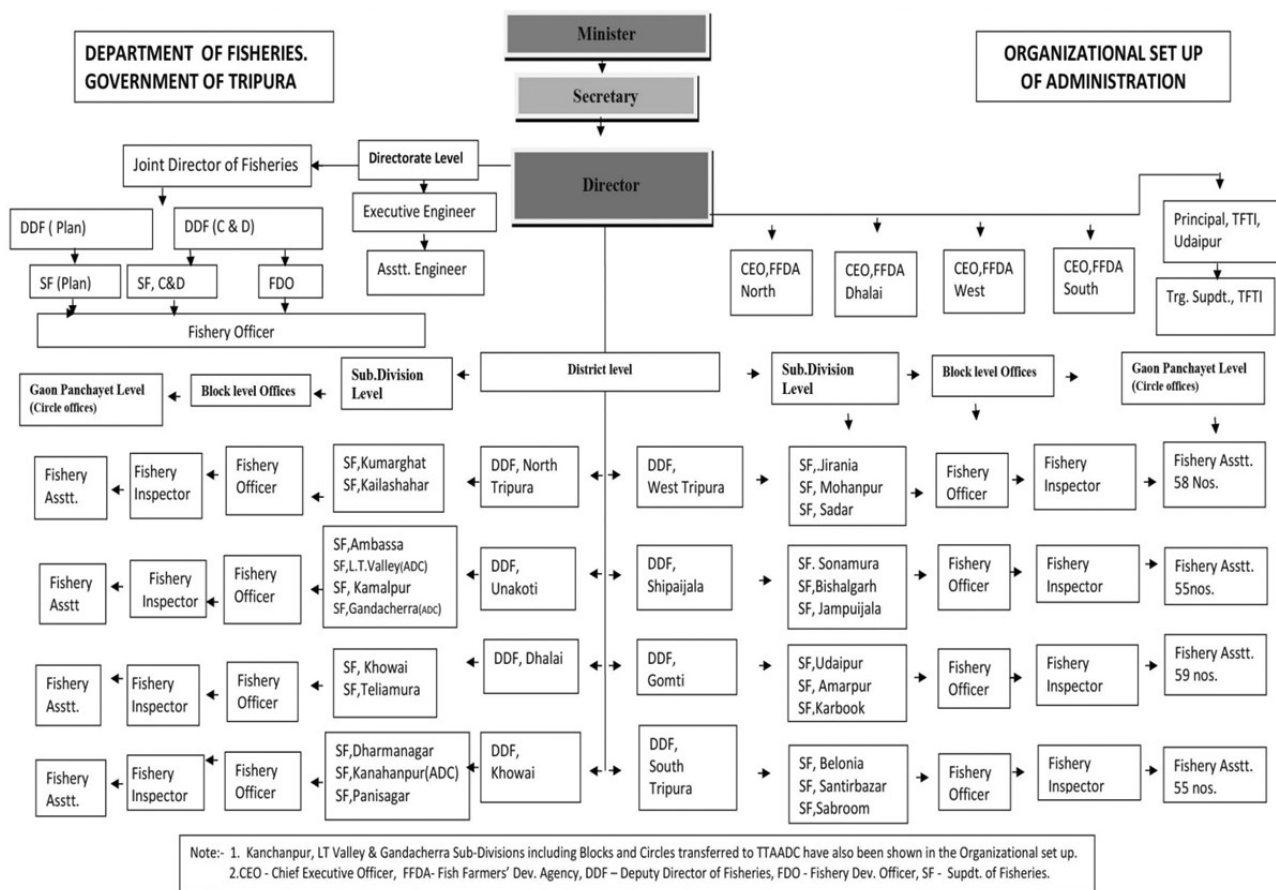


Fig. 3: Organogram of Department of Fisheries (source: <http://fisheries.tripura.gov.in/organization.htm>)

## Performance

Fish being an important constituent of diet in Tripura, the Perspective Plan put high emphasis on being self-sufficient in fish production in the state. While self-sufficiency in fish production is again a controversial term owing to the fact that not all types of fishes in the state can be cultivated in inland freshwater fish culture methods. Model aquaculture villages, special village and prawn villages are being developed as part of community involvement with adequate facilities like soil and water testing laboratories. As a result, many progressive fish farmers have emerged in the state,

Total fish demand 80,141 MT

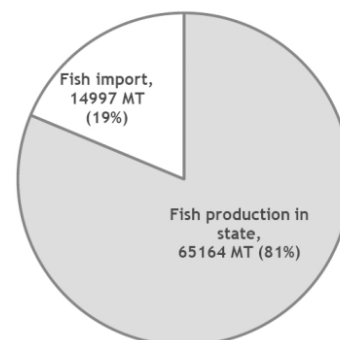


Fig. 4: Total fish import and export in Tripura. Source: DoF, GoT

with gradual increase in area under fish production and they are obtaining a yield as high as INR 3,000/kg/ha.

During 2014-15, total fish production in the state was 65,163.51 tons (63,746.22 tons from culture + 1,417.29 tons from capture), exhibiting 6.34 per cent growth over 2013-14. Per capita availability of fish was 17.62 kg, with a shortfall of 0.38 kg per capita against the target. The production is expected to increase to make available 18.4kg per capita for the fish eating population (37.52 lakh) of the state (Annual Plan and Action Plan 2016, DoF; pp-1). Target have been achieved and exceeded in fish seed production (demand: 195 million, production: 328 million), increase in number of fish farmers from 1.02 lakh in 2003-04 to 1.76 lakh in 2014-15 (14% increase have been observed in tribal fish farmers), culturable water area has increased from 13,290 ha to 25,661 ha (17% increase in tribal areas) from 2003-04 to 2014-15, fish production has increased from 17,980 MT to 65,164 MT during 2003-04 to 2014-15, productivity has also doubled in the state as well as in tribal areas during the same period (Directorate of Fisheries, 2016).

DoF have placed a lot of priority on extension activities for increasing scientific fish cultivation in the state, especially in the tribal areas, under the Tripura Tribal Areas Autonomous District Council (TTAADC). Door to door canvassing to increase awareness, camps, field trips, demonstration of scientific fish culture, trainings on fish farming technology, fish processing and value addition and production of Pabda and Magur seed in backyard hatchery, are regular programs. High emphasis is on community based extension through encouragement to cooperative societies for scientific fish culture and entrepreneurship development among SHGs. To motivate fish farmers at GP level/block etc., training camps are organized and incentives given to selected fish farmers for production of fish. Keeping in view of the above, the State has established seven training centers at Bishalgarh, Lembucherra and Collegetilla under West Tripura district, one at Udaipur under South Tripura district, two at Harerkhola and Chailengta under Dhalai district, and another one at Kumarghat of North Tripura district (<http://fisheries.tripura.gov.in/program.htm>).

## Policies

Various schemes under State Plan, Central Sector and North Eastern Council (NEC) funding have been under operation in the state. In addition, funding for infrastructure is also received under MGNREGA, RKVY and Backwards Region Grants Fund (BRGF). The State Plan focuses on increased fish productivity, fisheries extension, support to cooperative societies, and strengthening fisheries organization. CSSs support development of aquaculture, welfare of fisherman families, development of post-harvest facilities, strengthening database and information networking. NEC funding has been utilized for development of prawn culture, pig cum fish cultivation in tribal areas and duck cum fish culture in non-tribal areas of the state. RKVY funds are utilized for infrastructure development like construction of hatcheries, laboratories, training centers and retail fish markets. BRGF assistance in Dhalai district has been utilized to address critical gap in infrastructure like construction of fish storage centers, small fish market shed, packing shed, etc. Under MGNREGA, creation of new waterbodies, reclamation of old ones and culture input supply for these waterbodies have been undertaken.



Under the Perspective Plan period, productivity of fish in the state has exceeded target and one major reason for that was increased fund flow and increased extension efforts. Specific to skill development activities for both farmers and department officials, funds are allocated under various schemes of State department, Skill Development Mission, and National Fish Development Board (NFDB). Also, the DoF has identified fish farmers into three categories based on their performance and not on the area of water bodies owned by them. This has also helped the department to strategically plan intervention activities for each category with emphasis on extension.

**Table 1: Budget allocation for Annual Plan 2017-18 under various schemes and programmes**

Sl no.	Particulars of the scheme	Total amount (Rs in lakhs)
<b>A</b>	<b>Divisible pool</b>	
1	Comprehensive Programme to increase level of fish productivity	1308.00
2	Fisheries Extension, Information, Education & Training	21.90
3	Grants for FFDA's	100.36
4	Revitalization & Support to Fishermen Co-operative Societies	12.64
5	Scheme for Strengthening of Fisheries Organization	129.60
6	Scheme for providing 4% interest subvention on KCC loan under fish-ery sector	7.00
7	State share against CSS & NFDB programme	234.70
	<b>Grand Total</b>	<b>1814.20</b>
<b>B</b>	<b>Non-divisible pool</b>	
	NABARD Scheme against RIDF	200.00
<b>C</b>	<b>Central Assistance to State Plan (CASP)</b>	
1	NEC assisted activities	272.39
2	Blue Revolution CSS (80:20)	751.04
3	Dev. of Marketing facilities & other NFDB activities(90:10)	150.00
	<b>Total of Non-Divisible Pool including CASP</b>	<b>1373.43</b>
	<b>Total Budget provision of the Sector(A+B)</b>	<b>3178.63</b>

## Strengths

Intensive extension activities: DoF has prioritized extension and takes up all the required activities for fisheries development, starting from door to door canvassing. Community extension centers for fish seedling, encouraging community fish culture, etc., has also provided a boost in cultivation and increased popularity.

- Innovations:** The department officials, especially those at the field level, have developed many innovative technologies like induced breeding of Pabda and prawn (which were exotic breeds unsuitable for natural cultivation in the state), backyard breeding of fishes, etc., which have been introduced to increase the fish productivity and income of fish farmers.

2. **Categorization of farmers:** One unique step taken by the DoF is categorization of farmers based on their productivity (1st category: less than 15,000kg/ha; 2nd category: 1,500-3,000kg/ha; 3rd category more than 3,000kg/ha). Based on their productivity and performance, the intervention activities are developed, which has made farmers more efficient.
3. **Increased profit:** Fisheries have changed the condition of many in the state with farmers like Mr. Laba Telenga (started fisheries in leased pond of 2 acre in 1988 and at present has his own ponds with production of 1,500 to 2,000 kg per week) earning in crores every year (Fisheries Department of Tripura, 2016). Also, infrastructure development like proper market sheds and separate fish markets with running water and proper drainage to maintain hygienic conditions have also resulted in increased profit for farmers. Along with that, efforts in integrated farming with fruit orchards, piggery, duck and rabbit farming has also boosted production and profits of fish farmers. The change in economic status of fish farmers has also encouraged others to take it up.

## Challenges

1. **Lack of manpower:** Extensive extension requires a fairly large manpower which is a major constraint for the department.
2. **Documentation:** While the department has seen many innovations by its field officials, many of them go with the innovator because of lack of documentation. While pioneering works have been done in breeding technology of many fishes, lack of proper documentation, makes it difficult to follow up. Similar is the case for farmers' innovation.
3. **ICT skills:** The department is encouraging increased ICT use by its staff but lack of ICT skills has made it difficult. Also, the department has introduced GPS tracking of waterbodies for proper mapping and planning, but as they are to be done by the fishery assistants, training them also becomes a problem.
4. **Bottom up approach:** While the implementation part is very efficient, the bottom up approach is non-existent and so is follow up.
5. **Beneficiary selection:** Beneficiary selection is completely done by the Panchayat and there is no time for the already overburdened FAs to cross check and triangulate the list, leading to wrong selection of beneficiaries and benefits going to people who don't always need them.
6. **Research wing:** There is no research wing of the department which makes development of new technologies difficult for the FOs. A separate research wing might boost the performance of the sector further with increased focus on both edible and ornamental fish culture.

## Animal Resource Development

Livestock is one of the most integral part of rural households. They act as liquid asset in times of need and also ensure a year round income for farmers. Integrated farming with livestock as a component has also been proven to be very effective, both by research and practice. The Animal Resource Development Department (ARDD) (<http://ardd.tripura.gov.in/>) is entrusted with the responsibilities of all aspects of livestock and poultry development, augmentation of milk, meat and egg production, animal health care including prevention of animal diseases (some are of zoonotic importance) and

creation of infrastructure and human resource. The department is also providing required scientific training, extension and expertise support to livestock and poultry farmers/ producers to create sustainable livelihood opportunities and self-employment avenues in the whole state, particularly in rural areas (<http://ardd.tripura.gov.in/about.html>).

## Set up

ARDD operates under the Ministry of ARD and the Director heads the whole set up. Director, Additional Director and Joint Director supervise state level activities, Deputy Directors look after districts, Assistant Directors are responsible for block level activities, Veterinary officers are at the sector level and Extension officers, Senior ARD assistants and ARD assistants (para-vet professionals) are posted at the Primary Health centers at GP level.

## Manpower

(The manpower status is not available as the department did not provide any information regarding the same. This may be added after receiving the information from ARDD).

## Performance

For capacity development in the livestock sector, entrepreneurship development and vocational trainings are being provided to rural youth and farm women along with development of commercial dairy/sheep/goat/poultry farms. Trainings on commercial feed and fodder production, dry fodder enrichment, hay/silage preparation, etc., are also being imparted. Participatory mode farmers' trainings

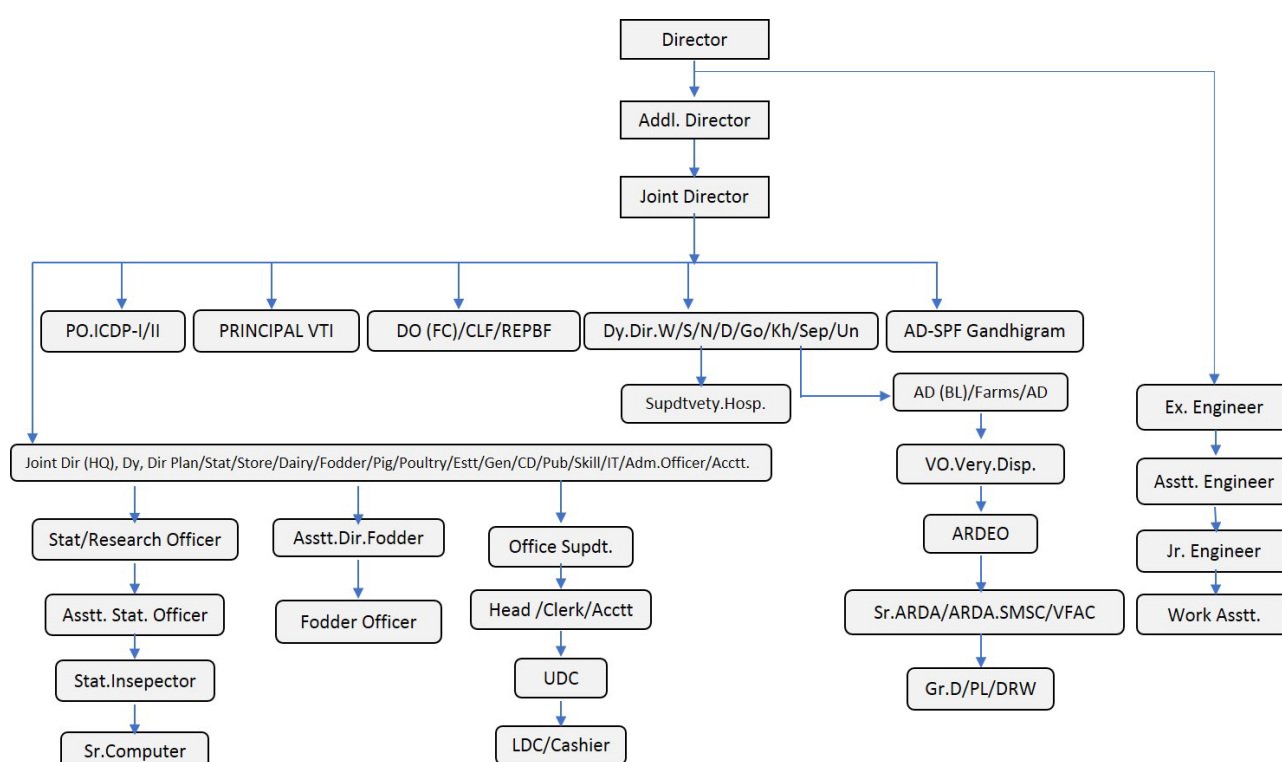


Fig. 5: Organizational set up of ARDD (source: <http://ardd.tripura.gov.in/organization.html>)

are also taken up by ARDD based on the socio-economic conditions of the farmers. Progressive farmers are also being trained to act as para-veterinary officials at community level.

As of 2016-17, 16 veterinary hospitals, 60 veterinary dispensary, 431 veterinary sub-centers, 26 breeding farms, 4 semen banks, 11 AI centers, 3 Liquid Nitrogen plants, 5 hatcheries, 70 Block Level Brooder House (BLBH), 4 feed mixing plants, 4 fed analytical lab, 1 College of Veterinary Sciences, 1 Veterinary Training Institute, 4 disease investigation labs, and 4 veterinary medicine stores are available under the Tripura Government. A Cooperative Milk Producers Union Ltd. has also been very successful in the state in dairy sector.

In the year 2014-15, 4,777,624 animals have been treated, 154,780 cattle and buffaloes have been artificially inseminated 59,734 calves (cattle and buffalo) have been born, and 6,477,119 vaccinations have been provided.

Measures for increasing milk, meat and egg production in the Recognition of Forest Rights (RoFR) areas have also been undertaken by the department. Milch cattle, piglets, goats and poultry are provided to the forest dwellers in those areas. Under MGNREGA, infrastructure for fodder storage and animal shed are also being provided.

## Policies

Major funding support for ARDD comes from State Fund, RKVY and MGNREGA. Skill development for unemployed village youth is also taken up through RKVY funding. Perspective Plan (2002-2012) has boosted the production and productivity of milk, meat and egg in the state.

## Strengths and Challenges

As no proper information was available from the department and appointments could not be taken, information regarding the strengths and weaknesses of the department could not be collected.

Extension activities other than technology transfer, are not conducted by the department. Supply of animals and animal products are being considered as extension activities (Table 2 and 3). Skill development trainings and workshops are also conducted under the Skill development Mission fund.

**Table 2: Extension performance of Government farms during 2015-16** (source: <http://ardd.tripura.gov.in/dairy.html>, as accessed on February, 2017)

Sl no.	Particulars	Achievements During 2015-16
1	Quantity of Milk Produced	1.11.333.50 kg
2	Quantity of Milk Supplied (GCMPUL)	93,368.50 kg
3	Quantity of Milk utilized for calf feeding	13,780.50 kg
4	Quantity of Milk utilized for Incentives	4179.50 kg
5	Quantity of Milk utilized for practical classes	5.00 kg

6	Average Milk Production/Cow/day	6.20 kg
7	Number of milch animals supplied under Govt.Programme	Nil
8	Number of Culled Animals Sold	Nil
9	Number of Breeding Bulls Supplied	08 nos.
	Revenue Generated during	
	I. Livestock Sold (in Rs.)	Rs.1,29,500.00
	II. Milk Sold (in Rs.)	Rs.32,15,626.00
	III. Manure Others (in Rs.)	Rs.1,750.00
	<b>Total</b>	<b>Rs.3346876.00</b>

**Table 3: Extension activities of ARDD** (source: <http://ardd.tripura.gov.in/dairy.html>, as accessed on February, 2017)

1.	Administrative Camp	73
2.	Animal Health /Vaccination/Awareness Camp	12,885
3.	Infertility	400
	<b>Grand Total of State</b>	<b>13,358</b>

However, related field studies conducted in the state have found that veterinary facilities are a major constraint for the tribal farmers in rural areas. Frequent disease incidence (bird flu, ranikhet, coccidiaosis in poultry and, foot and mouth disease, black quarter, swine fever, parasitic infections and mastitis in animals livestock) have made livestock a risky venture and non-availability of veterinary facilities has only aggravated the problems (Bhattacharjee, 2016).

## Krishi Vigyan Kendras (KVKs)

KVKs play an important role in the research and extension in the state. At present there are four functional KVKs and there is a proposal for four more KVKs. Currently, there are two KVKs under DoA, one under ICAR and one under Ramakrishna Mission, an NGO.

### Set up

As per the mandate of ICAR, the KVKs have uniform set up all over the country (Fig. 6). Headed by a Senior Scientist and Head, the technical staff consists of scientist, Subject Matter Specialists (SMSs), and non-technical posts of Programme assistants, farm manager, computer programmer, and lab technician.

### Manpower

All the KVKs in the state are suffering from manpower shortage at present. Most of the SMS posts are vacant. In KVK Dhalai, there is only one SMS, in KVK North Tripura four SMS are there but the post

for Senior Scientist is vacant, in KVK South Tripura five SMS are currently working while the Senior Scientist post is vacant. Many of the supporting posts are also vacant in them, increasing the workload of the SMS.

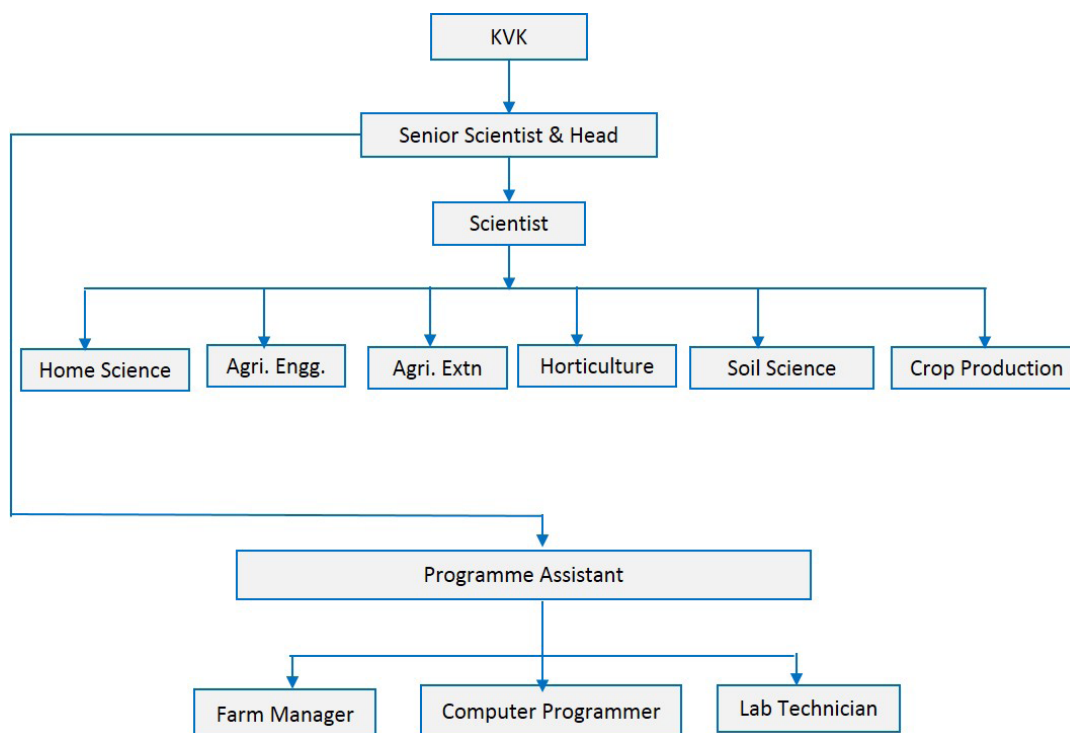


Fig. 6 Organizational structure of KVK

## Performance

The KVKs play an important role in the state, especially for extension. Since the overburdened state department cannot look after all the extension activities in the state, the KVKs come in to fill the gap. Also, pilot testing of various extension activities are also done through KVK. Unique extension methods like “Krishi Prajukti Jaan”, piloted through KVK Dhalai, (KVK SMS in a vehicle with agricultural publications, pico projectors, videos etc., go around the villages and showcase various agricultural technologies, hold group discussion with farmers and give solutions to their problems, play videos of different technologies in

A study conducted to appraise the performance of selected 10 KVKs in North East India under different administrative units like State Department of Agriculture, Assam Agricultural University, Central Agricultural University, ICAR-RC for NEH Region Tripura Centre, National Research Centre on Mithun, ICAR-RC for NEH Region Umiam and Shri Ramakrishna Seva Kendra, an NGO. The results indicated that in terms of organizational performance, total knowledge gained by trained farmers and perceived utility of the training content as assessed by the respondents, KVK West Tripura under NGO performed best. On the basis of performance of the beneficiaries too, KVK West Tripura had the best performance. Irregularity of funds, lack of career advancement schemes, insufficient staffs, and overload due to external schemes were the major constraints identified by the KVK scientists.

*(Presentation by Dr. Deepak Nath, Senior Scientist and Head, KVK West Tripura, Divyodaya at Multi-Stakeholder Consultative Workshop on Agricultural Extension Systems in Tripura at Agartala on May 30-31, 2017)*

evening markets and distribute publications, conducting puppet show with renowned puppeteers of the state for technology dissemination, etc.) has proved to be very popular and now have been scaled up to be implemented throughout the state under ATMA. Currently, KVK Dhalai is pilot testing Pest Scouts where 12 educated youths from the villages are to go around 48 villages and monitor different pests that occur in rice throughout the life cycle of the crop. The information will be made available in an online database maintained at KVK, authenticated by pest surveillance authority and monitored by the Ministry of Agriculture. The pest scouts will work on fields of selected farmers in villages and the information will be accompanied by GPS tracking of farmers' field and pests. Other than that, the KVKs have also been very successful in introducing lentil in the state, encouraging farm schools with progressive and achiever farmers as resource persons, etc.

## Strengths

1. **Facilitating extension:** The KVKs play an important role in extension service provision in the state, especially to aid the activities of DoA, the major extension provider in the state. Also, since the KVKs are funded by ICAR and they receive the required technologies from ICAR too, they play a pioneering role in pilot testing of technologies, on farm trials and extension methodologies, making them successful.
2. **Effectiveness and scale:** While the KVKs work in a particular district, they work with chosen progressive farmers, making diffusion of technology easier in case of success.
3. **Convergence:** KVKs, having been engaged in allied extension, work in convergence with different organizations like ICAR; State Govt. line departments; College of Agriculture, College of Fisheries and College of Veterinary Sciences; Financial institutions like National Bank for Agricultural and Rural Development (NABARD), Tripura Grameen Bank (TGB), and State Bank of India (SBI); and to rural farmers and farmer groups, connecting them all for technology transfer and beyond.

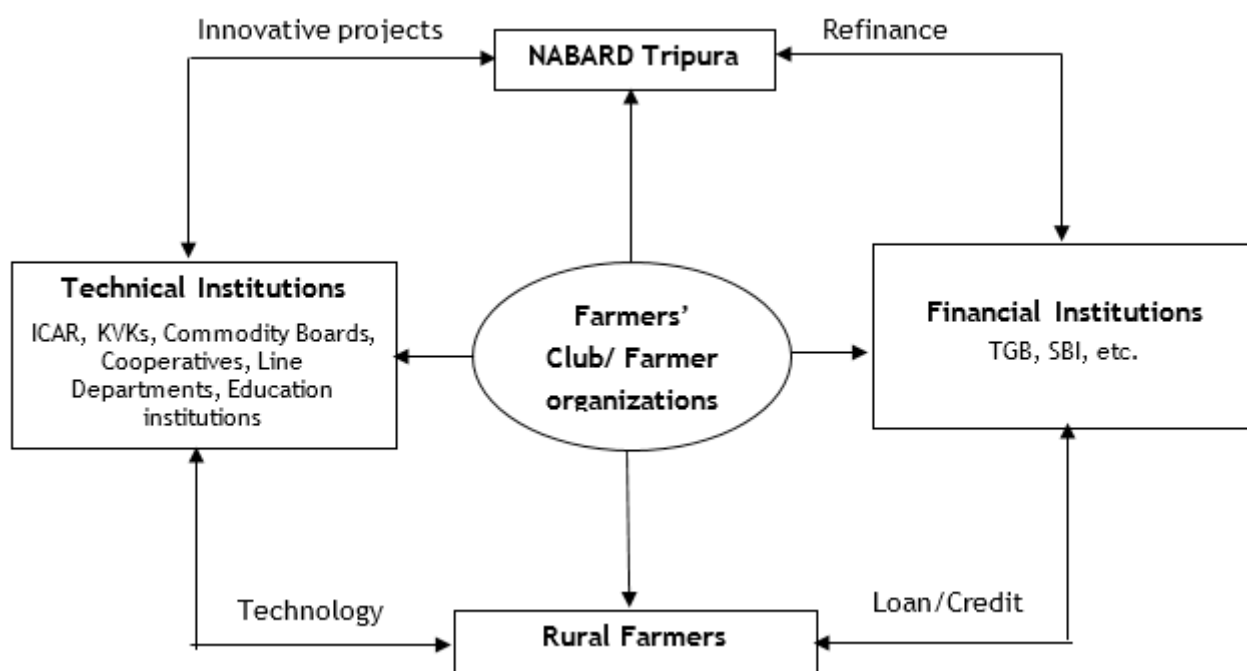


Fig.7: Convergence of various actors in agriculture sector for agricultural development in Tripura



## Challenges

1. **Competent manpower:** While KVKs are already performing their mandated duties of On Farm Trial (OFT), Field Level Demonstration (FLD) and trainings, they also have to take up extra extension activities to compensate overburdened state department. But as they are also limited in manpower, the KVKs under state department also become overburdened. Also, since some posts (Programme assistant, supporting staff) are non-technical and just requires graduation, competency in agricultural topics is low, which creates a hindrance in efficient functioning of KVKs.
2. **Extension specialists:** The post for SMS in agricultural extension is vacant in all the KVKs.
3. **Monitoring:** The system of monitoring needs revision and development for the KVKs to increase their efficiency. As of now, the monitoring system is weak at best.
4. **Finance:** Though the KVKs receive fund from ICAR for various activities, low funds have been a problem in carrying out various activities like trainings, demonstration and so on.

## Indian Council of Agricultural Research (ICAR)

ICAR Research Complex for North Eastern Hill (NEH) Region, Tripura Centre, was established with the mandate to provide adequate research base in the domain of agriculture, horticulture, animal and fisheries for the collection and preservation of cultivated or wild germplasm in crops, animals and fisheries for their subsequent utilization in improvement programmes and to disseminate viable technology among farming community. The Centre over a short span of its existence has developed technologies with identification of high yielding varieties of agro-horticulture crops, production and protection technologies and soil characterization relevant to the state. The centre has also developed and introduced suitable strains of poultry, rabbit, pig and goat as components for uplifting the economic levels of the local masses. 'Farming System Research' has generated significant interest among the development workers and farmers of the state (<http://www.tripuraicar.nic.in/>).

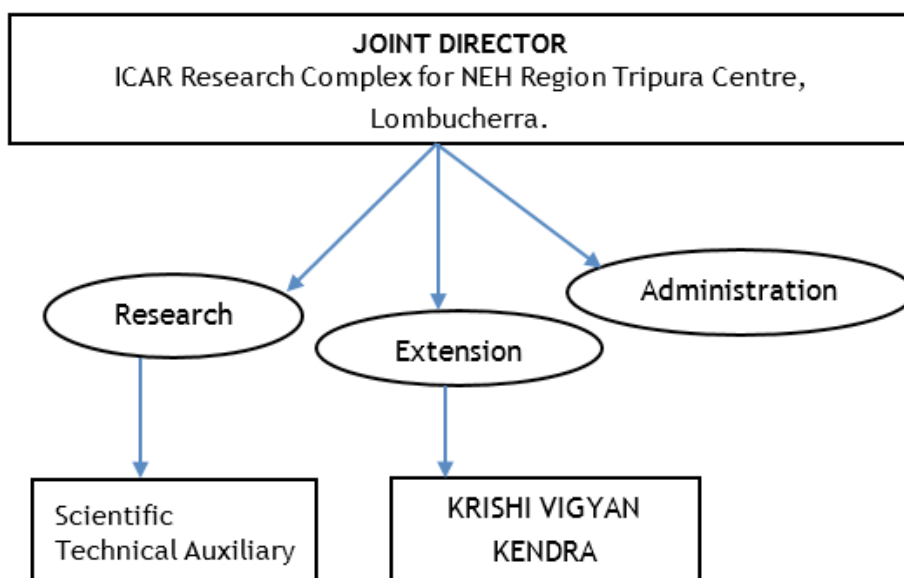


Fig. 8: Organizational structure of ICAR Research Complex for NEH Region, Tripura Centre (<http://www.tripuraicar.nic.in/>)



The ICAR Research Complex for NEH Region, Tripura Centre does not have a social science division and the outreach activities like technology transfer, Front Line Demonstrations (FLDs), input distribution or transfer of technology, capacity building, farmers' fair and exhibitions, training, holistic technology transfer in adopted villages, etc., are taken up by the KVK, Birchchandramanu.

## Forestry and Plantation

Considering 60 per cent of the state is under forest cover in one form or other and a large part of the tribal population being forest dwellers, forestry is an important part of the activities in agriculture and allied sectors. Tripura has been a pioneer in the country in implementation of Recognition of Forest Rights Act (RoFR) 2006. This Act recognizes the rights, responsibilities and authority of the forest dwelling schedule tribes and other traditional forest dwellers for sustainable use, conservation of biodiversity and maintenance of ecological balance, thereby strengthening the conservation regime of the forests while ensuring livelihood and food security of the forest dwelling schedule tribes and other traditional forest dwellers. It also recognizes the rights on ancestral land and their habitat. Government of Tripura, under the Act, has already allotted 1.73 lakh ha to 1.21 lakh forest dwellers. The forest dwellers' right to live in the RoFR lands and cultivate individually or as a group occupation for their livelihood has been established under the act. It also gives them the right to use all minor forest products including non-timber products of plant origin for their food security and livelihood. And for socio-economic development of the forest dwellers, an integrated approach including agriculture and allied activities like forestry, crop husbandry, horticulture, animal resource development and pisciculture have been taken up under different projects by multiple stakeholders.

### Tripura Forest Department

**Set up:** One of the objectives of the Forest department is creation of livelihood opportunities through sustainable use of forests, wildlife and biodiversity resources. For better management of forest and wildlife resources, since 1st April 2015, the state has been divided into 8 Forest Districts which are co-terminus with the civil districts. Each district is sub-divided into Sub-Divisional Forest Offices. There are 17 forest sub-divisions which are further sub divided into Ranges and Ranges into Beats. Beat is the lowest administrative unit of forest administration, headed by a Forester.

**Manpower:** There are 61 sanctioned IFS posts, of which 53 are filled. Against the sanctioned 17 TFS Grade I and 687 TFS Grade II posts, 7 and 54 are filled respectively. A sanctioned position of Informatics Research Officer is also filled. Of 199 sanctioned forest officer posts, only 57 are filled and of 493 sanctioned forester posts, 356 have been filled. 73 posts of Head Forest Guard are filled from the sanctioned 133 and 538 posts for Forest Guards are filled of the sanctioned 771. Eleven Junior Surveyor posts are filled of the sanctioned 16. A sanctioned post of Senior Soil Conservation Assistant is also vacant right now (<http://forest.tripura.gov.in/manpower-position-and-capacity-building>).

**Performance:** Of the allocated lands under RoFR Act, 85 per cent are upland, 8 per cent lunga (low land/wet lands) and 7 per cent plain lands. To reduce shifting cultivation in the FRA lands and ensure optimum utilization of these lands for sustainable production and creating opportunities, the forestry

sector is working with livelihood generation activities like plantations of economically important tree and plants like rubber, bamboo, jackfruit, drumstick; check dam creation for rain water harvesting in convergence with the Department of Fisheries; promotion of value addition and handicrafts sector; training and capacity building in plantation sector as well as value addition for efficient utilization of resources, and awareness generation of efficient utilization of land.

For community involvement, Joint Forest Management Committees (JFMCs) are formed both under Forest Department and JICA (Japan International Cooperation Agency) in 11 sub divisions across the state. As of now, 1000 JFMCs have been formed with involvement of 100,045 families in a total of 260,210.62 ha area.

**Policies:** Tripura has been one of the pioneer and leading states in India to implement the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 of Government of India. This Act has helped all round development of forest dwellers and the forestry sector of the state, as has been discussed earlier. Other than that, Tripura Forest (establishment and regulation of saw mills and other wood based industry) (Third Amendment) Rule; The Indian Forest (Tripura Second Amendment) Act, 1986; The Indian Forest Act, 1927; Tripura Land Revenue and Land Reforms (Tenth Amendment) act, 2013; and The Environment (protection) Act, 1986 are the major acts that influence activities in the forestry sector (<http://forest.tripura.gov.in/acts-and-rules>). Various State and Central Sector Schemes and plans have been implemented in the state under the acts as discussed below.

Under the State Plan, the department is funded for all training and extension activities in the state, for survey and utilization of forest land, social and farm forestry in convergence with TTAADC, forest research, wildlife conservation and education, afforestation, and related construction and administrative expenses. CSS like National Afforestation Programme and Integrated Development of Wildlife Habitats and development of medicinal plants are also being funded for and implemented. NEC Fund for development of plantations is also being utilized by the forest department (<http://forest.tripura.gov.in/programme-and-schemes>).

There are also a few projects running in the state – both national and international – for development of RoFR lands. The State sponsored 'Master Plan for increasing production and productivity of agriculture and allied sectors in the lands vested under RoFR Act, 2006 in Tripura' is providing sustainable livelihood opportunities to the forest dwellers while retaining their symbiotic relationship with the forest and ensuring their socio-economic development while retaining the ecological balance of the area (<http://forest.tripura.gov.in/sites/default/files/Programme-and-Schemes-forest.pdf>).

'Angan Ban Prakalpa' is a project for productive use of fallow land in private holdings and is being implemented by the forest department since 1996-97. Adequate fiscal incentives and technical guidance are being provided to the beneficiaries for raising plantations of forestry tree species on upland or non-arable areas. As of 2009-10, 26,591 families have been covered in 14 GPs with plantations raised in about 5,000 ha land (<http://forest.tripura.gov.in/sites/default/files/Angan-ban-Prakalpa.pdf>).

Tripura JICA (Japan International Cooperation Agency) Project was implemented to organize the forest dwellers and introduce sustainable forest based livelihoods. TTAADC villages formed 90 per cent of the target group during the project period of 2007-2017 (10 years) in 44 blocks of all the eight districts of the state. 463 JFMCs have been formed till 2014-15 with GPS survey of their boundaries. Agro-forestry plantations in 1,966.11 ha RoFR lands have been completed on convergence basis with MGNREGA. 1,326.13 ha water areas have been created with an annual fishery potential of 1,700MT. Up to March 2014, 69,456 community members have been trained, 2,852 SHGs formed and involved in various income generating activities like fishery, piggery, poultry, duckery, mushroom, honey, broom grass, agarbatti stick making, etc. Six Community Common Facility Centers are functional in bamboo based industry. About 283 artisans have been trained in bamboo based jewelry with two ornament making units, three basket making units, one furniture making unit and two turning product making units for SHGs. Other than that, handloom making initiatives for women have also been established (<http://tripurajica.com/>; Tripura JICA Project, 2015).

*Indo German Development Cooperation Project (IGDC)* also aims to improve the natural resource conditions for supporting enhanced livelihood of forest dependent communities of the state through 'Participatory Natural Resource Management in Tripura' project initiated in 2009 in 70 villages in Dhalai and North Tripura. The project is jointly implemented by Natural Resource Management Society of Tripura and jointly funded by the Government of Tripura and the German Development Bank. The project ran till March 2017. A total of 1,251 training programmes including exposure visit were conducted through which 32,926 participants were benefitted. Through these trainings 16,280 patta holders (land rights under RoFR, 2006) were benefitted. A total of 201 training programmes with 2,436 villagers on types of vocational trainings / trades (tailoring, handloom/weaving, motor driving, basic computer learning etc.) have been completed. After completion of the trainings, these trainees were graded based on their performance during the training. These successful trainees are now provided material support to initiate income generating activities (IGAs). Till date, a total of 389 such successful vocational trainees were benefitted through tools and equipment support. Out of 2,436 VT trainees, 87 have successfully started their ventures at group or individual level. These villagers are now earning in a range of INR 3,000 (tailoring) to INR 10,000 (solar repairing)/month. Besides, all the 175 villagers trained in Motor Driving have chosen 'Motor Driving' as their livelihood and earning in a range of INR 3,500 to 7,500/month. Livelihood trainings are also given to the trainees along with refresher trainings after providing them with livestock under the project. Nurseries are also developed in the villages to raise quality planting material. The villagers involved in these nurseries are able to increase their per month income by INR 8,000 to 8,400. Average income of the fishery groups created after constructing water areas now stands at INR 72,000. About 459 SHGs with 5,057 members have been formed and of them, 172 have been linked to SGSY scheme for assistance with various agro based enterprises increasing their household income to INR 11,144 per year through the MSEs. Product based clusters have also been developed through the project. Cluster members under the Dumburnagar fishery cluster have earned a profit of INR 3.7 lakh in 2014-15. Groups involved in the mushroom clusters are earning in a range of INR 5,000 to 7,000/ month. The cluster members of Thumsarai para turmeric cluster have already harvested 10,500Kg of raw turmeric, the market value

of which is pegged at INR 2.1 lakh. Average per month income of the Agarbatti cluster members now stands at INR 25,000. The MSE members involved at Gurudhan para Rice mill are now earning INR 5,000 to 7,000/month (<http://www.tigproject.in/tig/Projectstatus/ProjectStatus.html>).

## Strengths

1. **Community based approach:** For rehabilitation and better management purposes, the forestry sector has focused more on group approach. Community mobilization has been a major part of their extension initiatives which has helped to get increased response from the intended forest dwellers.
2. **Economical use of forest resources:** With focus on ecological conservation, the economic activities have revolved around the economic use of forest products that was an integral part of the forest dwellers and their way of life. Rehabilitation efforts did not drastically affect the traditional life style of the people, but rather, tried to conserve their ways by scientifically improving them while keeping the essence.

## Challenges

Since personal appointments were not available with the forest department personnel, for the first author of this working paper, the challenges could not be enumerated other than the lack of quality manpower specialized in extension.

## Rubber Board of India, Tripura Regional Centre

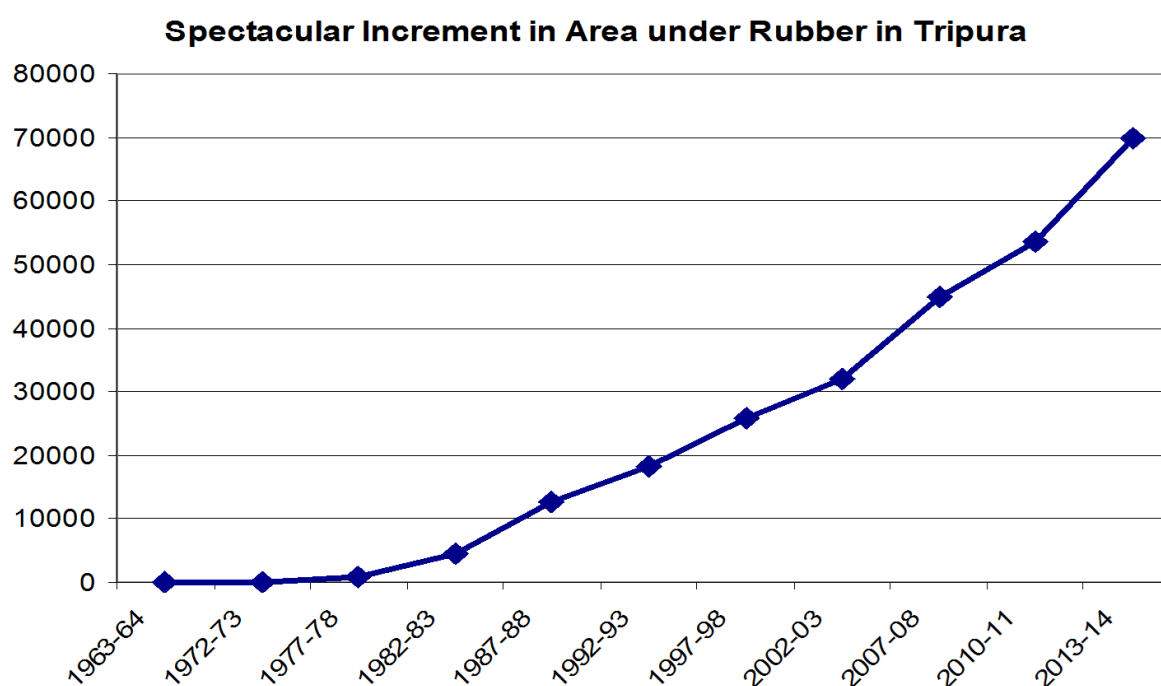
Tripura currently has the second largest area under rubber production in the country (75,000 ha) and is also second in terms of rubber production (50,000 MT) after Kerala. Rubber Board introduced the concept of rubber plantations in Tripura and started its work way back in 1963 with the first plantation at Paticherri as a soil conservation measure by the Forest department, Govt. of Tripura. The first Field Office was established in 1967 at Agartala and the regional office was established in 1979. The first demonstration farm was established at Tulakona in 1986 and at later periods, as the work domain of Nucleus Rubber Estate and Training Center (NRETC) increased, regional offices were established in every district of the state.

**Set up:** NRETC/ Zonal Office, Agartala: Headed by a Jt. Rubber Production Commissioner, this office is monitoring and coordinating the activities of all the Board's establishments in Tripura and also directly operating the Block Planting Units in West Tripura District. The NRETC/Zonal Office is also maintaining a Regional Nursery cum Demonstration Plot at Tulakona for generating good quality planting materials, as well as for demonstration.

**Table 4: Set up of Rubber Board regional offices in Tripura**

Regional Office (headed by Deputy Rubber Production Commissioner)	Field Station	Tappers Training School	Block Plantation	Regional training centre	Producer Companies
Agartala	Jirania Taranagar	Amtali		Agartala (Provides training on management, crop processing, capacity building etc., to various stakeholders, including growers, tappers , RPS functionaries, officials, plantation executives sponsored by Rubber Mission, Govt. of Tripura as well as trainees selected by the board)	M/S Manimalyar Rubber (P) Ltd. (Owned by Rubber Board of India)
Bishramganj	Melagarh		632 ha area 562 tribal beneficiaries		
Udaipur	Belonia, Santirbazar, Amarpur, Manu Bazar				
Santirbazar	Belonia Manubazar				Tripura latex (owned by rubber growers of the state)
Dharmanagar	Kumarghat	Juri	213 ha area 206 tribal beneficiaries		
Ambassa	Khowai and Kamalpur				

**Manpower:** Currently, the manpower of Rubber Board Zonal Office, Tripura Centre is 118. But since Rubber Board applies community extension methods in the field, much of its extension workload is assisted by the village level resource persons they have created through Refresher Training Programmes (RTPs).



*Fig. 9: Increase in area of rubber plantations in Tripura. Source: Rubber Board Zonal Office, Tripura*

**Performance:** In statistical terms, as of 2016-17, approximately 78,000 ha area has been covered under rubber plantation with around 90,000 beneficiaries. But for holistic development of the beneficiary rubber growers, Rubber Board has been the most important stakeholder in changing the economic condition of the rural tribal rehabilitated jhumia population of the state. Of all the schemes and projects, Block Plantation Scheme has been the most significant one because of its community extension approach and end to end support to the growers. A total of 182 Rubber Producer Societies (RPS) have been formed in the state for munity involvement in rubber production and marketing under the Group and Block Plantation schemes.

Exclusive activities of the zonal office are Block Plantation Project (BPP), Regional Nurseries, Demonstration Plots, Regional Rubber Training Institute (RRTI) and the Tripura Project. Under BPP, total area planted is 3,800.37 ha with 3,557 beneficiaries. Under the regional nursery creation, a total of 14.32 ha area has been covered. Under demonstration plots, forest areas are leased from the Forest Department and a total of 14.32 ha are currently covered under demonstration plots. RRTI has so far trained 19 batches of trainees on plantation management, quality improvement and skill development. Under the Tripura project in convergence with PMKVY, training of 85 batches with 2,550 trainees have been approved for training during May 24 – October 15, 2017. In collaboration with the State Skill Mission, 180 candidates have been trained in 2016-17 and 500 more proposed for 2017-18.

## Schemes and policies

The Rubber Board is awaiting new schemes and policies, consequent to the adoption of Niti Aayog. As of now, the following services are being rendered by the Board to the growers:

- Generation and supply of quality planting material.
- Making availability of rain guarding materials through Rubber Board companies.
- Awareness cum training in rain guarding.
- Training on rain water harvesting.
- Awareness and training on plant protection measures.
- Training and live demonstration on low frequency tapping and Control Upward Tapping.
- Skill Development Training in association with NSDC and Tripura Skill directorate.

**Strengths:** Rubber Board introduced rubber cultivation in Tripura and has made it a huge success through rigorous extension activities and end to end support to the growers. Some of the major strengths of the rubber extension system that can be replicated by other extension stakeholders in the state as well are as follows:

1. **Extensive extension activities:** For introduction of rubber cultivation in the state, the field officers played important roles in the state. They would travel to the villages, go into tea shops, public gatherings, panchayat meetings or any other places and talk about the production process and benefits. Very frequent surprise inspections were also done by the field officials to check the status of investment in the plantations with the incentive and subsidies provided.



2. **Group approach:** Rubber Board preferred group approach to mobilize the people in the villages rather than individual contact for a transparent process of community involvement. Informal contacts were more than formal ones in the initial stages.
3. **Opinion leaders:** During the meetings in the villages, key opinion leaders were identified and were involved to mobilize people. During door to door visits too, opinion leaders accompanied the officials from Rubber Board for better response from the villagers. Also, the Rubber Board officials ensured that the opinion leaders were not politically inclined to ensure fair selection of beneficiaries.
4. **Subsidies and incentives:** During the initial period, free planting materials and incentives for maintenance of the plantations were given. High involvement of the extension officials in the field provided the required know-how to the growers or the interested villagers.
5. **Gender sensitive approach:** Women were actively involved in the process by female field officials who would gather them in the afternoons (their free time) to talk about the benefits of rubber plantations and its effect in increasing their income.
6. **Beneficiary selection:** To avoid various types of unwanted influences in beneficiary selection, the Rubber Board field officials selected the beneficiaries themselves, instead of relying on Panchayat bodies. This ensured a fair selection of beneficiaries without political influence or nepotism.
7. **Community extension through RPS:** Rubber Producer Societies (RPSs) were the earliest and most successful form of community extension introduced in the country. A major reason for the high success in making Tripura the second largest rubber producer in terms of area and production in the country is this particular scheme. A total of 100 ha plantation with 50-200 members in a radius of 3-4 kms form a RPS. Under the RPS, the growers are formed into a society which ensures easier management, capacity development, inspection, subsidy distribution, marketing and processing. Some RPS have evolved to be resource centres to the new growers as well as providing training in technical and functional skills. Various schemes of the rubber Board as well as the State Government are channelized through the RPS.
8. **Innovative marketing model:** Rubber Board ensured a very good market support to the producers by forming Rubber Producers' Companies. At present there are two such companies in the state - M/S Manimalyar Rubber Ltd. (owned by Rubber Board, HQ at Kottayam, Kerala) and Tripura Latex (owned by rubber growers with financial assistance from Rubber Board, HQ at Agartala, Tripura).
9. **Policy support:** A high level of policy support and enabling environment from the Government of Tripura for introduction and popularization of rubber cultivation in the state has helped the cause of high adoption of the technology by the people and successful rehabilitation of the tribal jhumias in the state.
10. **Convergence:** Rubber board has worked in close convergence with the Tribal Welfare Department, Government of Tripura for implementing the Block Plantation Scheme with the objective of rehabilitation of the tribals. With convergence with the Rural Development department, MGNREGS funds were channelized to the block plantations and the growers were employed in their own field as wage labor for intercultural operations too.

**Challenges:** While extension system of Rubber Board has proved to be exemplary in the state, a few challenges were also faced.

1. **Capacity development:** Capacity development of the field officials in new technical and functional skills are sometimes a challenge as keeping up with recent developments is not always possible.
2. **Infrastructure:** The second major challenge faced by the rubber board was more infrastructural (lack of transportation facilities, group processing centres, etc.) and financial (lack of funds for increasing processing facilities), rather than on capacity development level.

## **Tripura Forest Development and Plantations Corporation Ltd (TFDPCL)**

Tripura Forest Development & Plantation Corporation Limited (TFDPCL) is a Public Sector Undertaking of the Government of Tripura. The Corporation is mandated for development of forests through plantations and upliftment of the economically weaker sections, especially the tribal population of Tripura. The corporation was registered under the Companies Act, 1956 on 26 March, 1976. The main objective of the Corporation is to carry out business in rubber cultivation, processing and promotion of rubber and bamboo based industries. The Corporation work is based on an annual plan, duly approved by the Board of Directors. Major activities of the TFDPCL are extension of plantation, management of the existing plantations, production and marketing of rubber based products. While the Tribal Welfare Department, Government of Tripura deals with beneficiary selection, TFDPCL takes care of production, purchase and marketing of plantation based products.

TFDPCL is the first corporation in the North East and second in the country to receive the international forest management certification from the Forest Stewardship Council (FSC), Bonn, Germany. FSC certification is a globally accepted forest certification label. Having the certificate and logo, the rubber wood and its products can be marketed as green products and receive acceptance from environmentally conscious green consumers, thus opening a global market for TFDPCL.

**Set up and manpower:** TFDPCL is headed by the Managing Director under whom Company Secretary and Executive Secretary work. Executive Secretary looks after coordination and plantation (both rehabilitation and commercial). Divisional Manager (DM), Headquarters, look after the training aspects and field level activities of TFDPCL. DM's are also responsible for the monitoring and evaluation activities of the corporation (Fig. 10).

Currently, there are 74 official staffs and 140 field level staffs of TFDPCL.

**Performance:** TFDPCL looks after production and marketing of forest and plantation based products like rubber and rubber wood. The corporation has its own plantations as well as it works on beneficiary plantations.

For the beneficiary selection, TFDPCL depends on the Gram Panchayat or Village Council (in TTAADC areas). The corporation buys products directly from the producers at the existing market rate and the money is transferred to the beneficiary account. Funds are also provided for village resource development. The major extension activities taken up by TFDPCL with its beneficiaries are



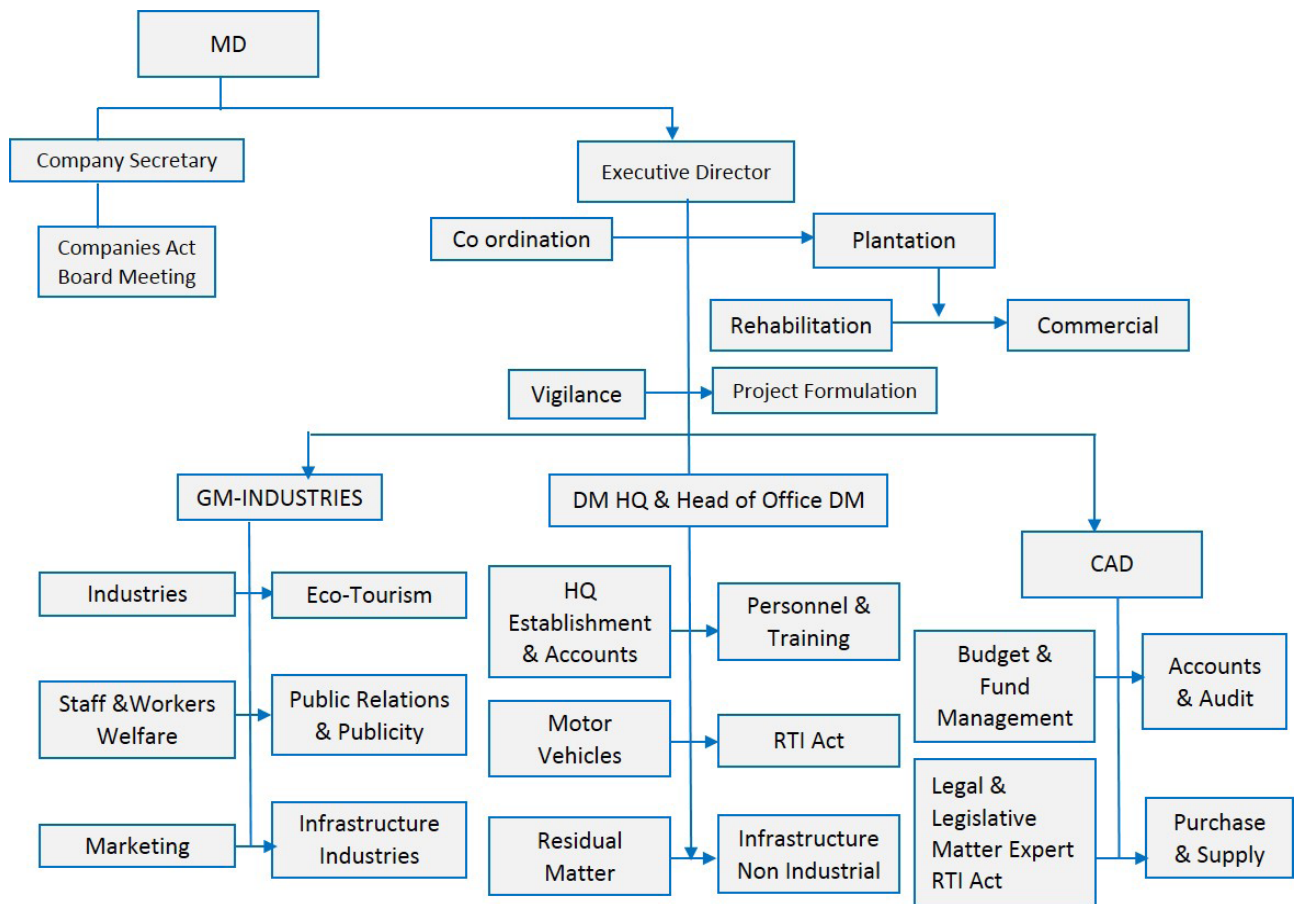


Fig. 10: Organizational set up of TFDPC (source: <http://tfdpc.tripura.gov.in/our-organization>)

demonstrations, skill development of beneficiaries and creation of village resource person. Youths are selected from each village based on competency, age and skills, and are trained on various tapping techniques. They are also given training allowance during the period. These youth after training, work as resource persons in the villages for other plantation owners.

TFDPC also looks after processing of rubber timber and manufacture of furniture from them. For commercial utilization and value addition to rubber log, Timber Treatment Plant has been established in 1999.

Furniture in all the government schools and colleges in Tripura are supplied by TFDPC.

Rubber production for the year 2015-16 was 2,858 MT for TFDPC. From its concentrated latex factory, 450 MT of Cenex has been manufactured. At its industrial unit, high quality slid rubber wood is also produced. Overall, the PSU had a turnover of INR 49.14 crores in the year 2015-16.

Policies: Forest Management Plan is the only policy currently implemented by TFDPC with extension component. Permanent settlement of the tribal people for rehabilitation in degraded forestland is being taken up under this plan. Trainings on starting and maintaining rubber plantations are provided to the tribal families. Rural youth are trained on tapping, so they can in turn train others. Through this plan, TFDPC is contributing significantly to employment generation and socio-economic development, particularly in rural areas of the state.

**Strengths:** Tripura Forest Development and Plantation Corporation Limited (TFDPCL), is a Government of Tripura undertaking with its corporate headquarters at Agartala, capital of Tripura. TFDPCL manages commercial rubber and bamboo plantations spread over 38 field stations or Rubber Plantation Centers (RPC) and are under the jurisdiction of four plantation divisions, one Factory Division and one Industrial Estate spread over all the eight districts of Tripura. The TFDPCL is one of the high performance corporations of the state of Tripura having contributed immensely in the socio-economic development of the otherwise traditionally nomadic tribal communities practicing shifting cultivation in the natural forest areas (<http://tfdpc.tripura.gov.in/>).

**Challenges:** Field level employees are not particularly familiar with extension concepts, though they are actively engaged with the beneficiary farmers. But also, considering TFDPCL engages more in maintenance of own plantations, procuring and manufacturing rubber wood timber, they deal in extension activities in a much lesser scale compared to field officials from Forest department or the Rubber Board.

## Tripura Bamboo Mission (TBM)

Bamboo has always been a very integral part of the tribal lifestyle in Tripura. Since time immemorial, they have been highly dependent on the bamboo forests for building huts, household items, handloom structures and even handicrafts that are famous across the country and the world. But with shifting cultivation, deforestation and increased focus on other sectors, bamboo based lifestyle lost its way in the state. During rehabilitation efforts of the tribal people by the State Government, bamboo plantations also got high importance in livelihood activity generation of the rehabilitated tribal families. With that objective, TBM was initiated for integrated development of the bamboo sector of the state in August 2007 in public private partnership (PPP) mode with the Infrastructure Leasing and Financial Services Ltd. (IL&FS) clusters.

**Set up:** TBM is a society registered under Societies Registration Act 1860. It is headed by the Chief Secretary, Government of Tripura and the General Body comprises of Secretaries and Head of Departments of Forests, Industry, Handicrafts, Rural Development, Social Welfare, Tribal Welfare and Finance, Financing institutions, etc.

**Manpower:** TBM, being an enterprise in PPP mode, is represented by both Govt. of Tripura and IL&FS. Under the state government, four officials are employed in the state, while under the project management team, seven members are employed in Delhi. The project implementation team has 20 members who are actively engaged with field level activities. The sub-sectors of TBM are incense, handicrafts and furniture, and plantations. Each sub-sector is headed by a team leader. Other than that, at the field level there are mobilizers to effectively communicate with the beneficiary bamboo growers. The mobilizers are also called “Bash Bandhu” and are paid an honorarium of INR 3,500 to 5,000 depending on their work area and efficiency. Currently, 19 mobilizers are appointed under TBM to look after plantation related activities. Above the mobilizers are the field/cluster coordinators and above them are the supervisors.

**Performance:** The turnover from bamboo sector have increased from INR 280 million in 2006-07 to INR 1,014.2 million in 2014-15. The TBM has so far exceeded in not only consolidating the bamboo sector in Tripura but has also initiated a number of activities for value addition and scaling up of the production to realize the market potential of the sector. The initiatives in scaling up production of polished sticks, rolled sticks and perfumed sticks with corresponding capacity building, institution development and market linkage are noteworthy.

In terms of institutional development, so far more than 1,000 SHGs, 90 producer societies and community owned institutions have been created and supported by TBM since 2007. It is also continuously encouraging artisans and producers to organize themselves into their own grassroots institutions.

Capacity development of over 13,000 artisans has been taken up till now on various aspects of bamboo plantation from production to marketing. Other than that, various technologies relate to bamboo treatment, dyeing, use of modern imported machines for stick making, etc., have also been introduced in the state.

While 17 cluster level Common Facility Centres have been set up, another 50 small village level units owned by the artisan community have been established and supported through various interventions of the TBM.

Agarbatti or incense sector is the most profitable sub-sector for the state and with introduction of mechanization using globally accepted technology, the incense sticks are made of world class quality.

*TBM is providing end-to-end support to the bamboo growers and the artisans in the incense/ agarbatti sub-sector, starting from initial support to market linkage through tie-ups with various national and international agencies and e-commerce sites like eBay, Flipkart, Snapdeal, realshoppe.com, etc.* In bamboo plantation sub-sector, TBM has revolutionized the bamboo growing by introducing High Density Bamboo Plantation (HDBP) technology for the first time in the state.

TBM is also organizing the bamboo growers and farmers engaged in commercial bamboo plantation and nursery into Bamboo Producers' Societies. Around 1,000 ha have been brought under commercial bamboo plantation across various rural development blocks in the state.

India's first and only Bamboo Industrial Park has also been established in Bodhjungle, Agartala covering 1,365 acres as an industrial growth centre.

**Schemes/policies:** State Bamboo Policy 2001 by Forest Department, Government of Tripura, is the major policy that has been driving the bamboo based economic development in the state. It emphasizes the fact that bamboo is not a staple commodity and hence, development of the sector should be market-led and community based. It also mentioned removal of full state control from resource management aspects and emphasized on sustainable community based management to maximize the incentives. It emphasized on proactive involvement of the communities to integrate

them in market mechanism and empowering them against shocks, rather than just protecting them. Emphasis has been placed high for community and private sector participation with convergence between allied sectors and actors. Based on the objectives, various projects are undertaken by TBM in the state (Forest Department, 2001).

**Strengths:** The major strengths in terms of extension services that have been observed in TBM are:

1. **Community based activities:** Community involvement has been the modus operandi of TBM since inception. The participation of people involved was given high importance and is seen as a major reason for the success of the mission.
2. **Integration of activities:** While bamboo was the focus crop, the TBM field supervisors encouraged beneficiaries to grow high value agricultural crops like ginger, turmeric, arhar and colocasia in the bamboo plots during the initial years with the dual purpose of income generation and soil nutrient enhancement. While the inputs were to be arranged by the beneficiaries themselves, the mobilizers of TBM provided them with technical knowhow on the production and protection aspects.
3. **Gender sensitive approach:** Women were given more priority while selection of beneficiaries for plantation development, artisanship in incense and handicrafts industries because it was seen that women were more serious in the endeavors and the utilization of the financial aid was more efficiently done by the women.
4. **High involvement in the field:** Initially to introduce bamboo cultivation as a commercial activity, TBM mobilizers visited each house in the villages talking about the activities. This ensured more personal involvement and as a result, people took the ideas more seriously. Also, after establishment of the plantations, the mobilizers follow the same approach, to be in constant touch with the producers and provide them with any support whenever needed. The increased trust factor among the producers and the mobilizers has proven to be of additional advantage in influencing them.
5. **End to end support:** TBM has provided end to end support to the producers starting from selection of bamboo species to marketing linkages. TBM Trade Facilitation Cell was set up to support the grassroot producers through central supply chain management between buyers and sellers. Marketing tie-ups with private players like NEHHDC, THHDC, ITC, Mother Earth and Giskaa has been facilitated. B2C marketing through e-commerce platforms has also been done. B2B marketing through Indiamart.com, Tradeindia.com, and Indiatradezone.com has also been arranged by TBM.
6. **Regular training and monitoring:** An integral part of engaging with the producer communities have been regular monitoring and providing training and other support services as and when required. This has made the communities more responsive and equipped with better technical knowledge. Also, training in handicrafts and incense making are frequently converted to involve women in income generating activities.

## Challenges

1. **Convergence:** Convergence has been a major challenge TBM faced when engaging with different

partners/stakeholders. The response for convergence has been very feeble with other stakeholders in the agriculture and allied sectors, which has sometimes been a hindering factor.

2. **Selection of beneficiaries:** Being in PPP mode, the beneficiary selection for TBM is done by the Panchayat bodies which sometimes become problematic because of nepotism, political influence and other such factor, making the benefits go to people who are not actually in need of them. To overcome this, TBM has strategized to select the women member of the family from which the beneficiary has been selected and involve them instead.
3. **Capacity development:** Capacity development of the field staff is also an issue sometimes, as they are not well versed with various innovative extension methodologies, though practically they are active in the field.

## Tripura State Agricultural Management and Extension Training Institute (T-SAMETI)

The state level nodal training institute, T-SAMETI, is established under the scheme “Support to State Extension Programme for Extension Reforms” in the year 2005.

### Organizational set up and manpower

For smooth functioning and to achieve its goal, the T-SAMETI is provided with two autonomous state bodies viz., (A) The General Council of T-SAMETI and (B) The Executive Council of T-SAMETI. Deputy Director of Agriculture (ER) is the Director of T-SAMETI. Currently there are four faculties in T-SAMETI and the post of computer operator is vacant.

### Performance

T-SAMETI plays an important role in capacity building of agricultural stakeholders and in establishing a well-structured extension mechanism in the state. It also works as a think tank for policy formulation regarding ATMA and of the Department of Agriculture. T-SAMETI conducts many capacity development programmes for extension personnel, progressive and achiever farmers and VLWs. Other than that, mandated activities of technology dissemination through farmer-scientist interaction, field day, demonstrations, etc., are also arranged by T-SAMETI.

### Policies

T-SAMETI works in formulation of some of the Strategic Research and Extension Plan (SREP) and State Extension Work Plan (SEWP).

### Strengths

Through ATMA, T-SAMETI has been implementing some innovative and popular extension methods like “Krishi Prajukti Jaan” (Agricultural Technology Vehicle) (pilot tested by KVK, Salema and scaled up

for implementation by T-SAMETI) in the rural areas to interact with farmers and take technology to their doorstep. Puppet shows are being conducted with popular puppet groups of the state. Jingles and cartoons are also used to increase people’s interest in agricultural issues and technologies and disseminate them in the rural areas. Other than that, the strength of T-SAMETI is similar to that of the DoA.

## Challenges

1. **Manpower:** Manpower is a major constraint that makes conducting regular works challenging at times. Updating SREP and SEWPs, Action Plans, etc., gets hindered because of lack of manpower in T-SAMETI.
2. **Funding:** For SEWP in the financial year 2015-16, fund received was much less, about 25 per cent of the approved plan. Since the employees are also DoA employees, they are not paid from the ATMA fund. Also, because there is no dedicated manpower, fund for that has also not been received. Whatever fund is allotted is received much later in to the year and as it doesn’t come directly to T-SAMETI, it reaches by around September-October. Important activities are therefore either delayed or conducted from the state fund.

Other than that, the challenges are the same as the DoA since the functioning is very much similar.

## Agricultural Technology Management Agency (ATMA)

### Set up

ATMA in Tripura has not recruited any staffs and the duties are mostly carried out by the department officials. Department of Agriculture has taken up the lead role in ATMA implementation and the set up and the roles of officials are given in the figure (Fig 11) below.

ATMA in Tripura is not functioning with the recommended structure followed in the rest of the country. There is no dedicated manpower for ATMA and instead, the department officials work with additional charges in ATMA. There are eight ATMAs in the eight districts of the state. Deputy Director of Agriculture (DDA) of each district is in additional charge of PD ATMA. Other officials from the DDA’s office take up various charges under ATMA. The Superintendent of Agriculture acts as the Convener of Block technology Team (BTT). The Sector Officers are in additional charge of BTM and the VLWs act as ATM.

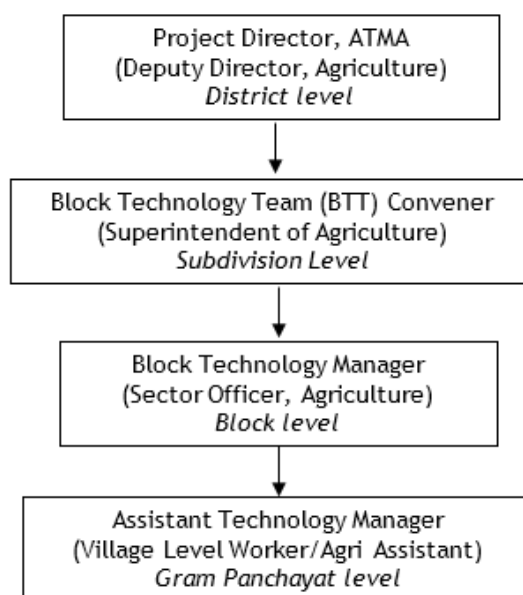


Fig. 11: Organizational structure of ATMA in Tripura



The State Government has decided against the appointment under various posts in ATMA because of two major reasons. The posts under ATMA are contractual for a fixed period after which the Govt. can terminate the employment of the staffs like BTM and ATM. Also, in case the project is discontinued by the Central Government, the State Government has to let go of the staff. But while that is the norm, in an earlier case of Sarva Siksha Abhiyaan, where teachers were employed on contractual basis, after the completion of the project period and its discontinuation from the Centre, the contractual staff went into agitation for permanent employment. This incidence of the past made the state government skeptical about employing staffs in ATMA on a contractual basis. Another problem was the salary structure of ATMA. While the job of ATM under ATMA is similar to that of VLW in the state, the salary is higher for ATMA staff as that was according to the 6th Pay Commission, which the State Government is yet to implement. The same problem arises for posts like computer operator where those from the State Government draw around INR 10,000/month while those under ATMA draw a salary of INR 16,000/month. To avoid the discontent among the state employees for different pay structures, the State Government avoids employing contractual staff under ATMA.

This has increased workload on the already overburdened employees of DoA, who have very little or no time for extension activities and so these are conducted under ATMA. Again ATMA has its own targets to fulfill under various schemes. And since they do not have extra staff to conduct those activities, ultimately ATMA ends up becoming a mere extension of DoA, concentrating only on target fulfillment for the financial year and with no real time or concern for convergence of extension activities. While some officials, out of their personal interest try to maintain their contact with farmers to advise them whenever required, being overburdened with both the works makes it difficult – to say the least – for them to effectively perform any of their duties.

Another flaw in the system observed was that ATMA has become synonymous with DoA in the state with all the appointments from DoA and consequently, all the attention is driven to the agriculture sector only. While in the Inter-Departmental Working Group (IDWG) members are from allied departments, functionally none of the departments have much to contribute. Convergence in ATMA has completely failed in the state and so has become need based working.

Since all other challenges are the same as that of Department of Agriculture, it is not being discussed here again to avoid repetition.

## **National Bank for Agricultural and Rural Development (NABARD)**

Being an apex development bank of India, NABARD plays an important role in rural development. Major initiatives of NABARD have been creation of SHGs in rural areas, especially women SHG's, creation of FPOs and mobilizing the poor into groups. Initiatives for digitization of SHGs have also been taken up recently through NGOs for better monitoring. Other than that, NABARD has also created infrastructure and invested in developing social innovations in rural Tripura. Both directly and indirectly NABARD has been contributing in the development of agriculture and allied sector of Tripura.



**Table 5: Banking network in Tripura**

Agency	Name of bank	Rural	Semi-urban	Urban	Total
Commercial Banks	31	123	81	77	281
RRB	1	101	30	13	144
SCB/DCCBs	1	40	12	11	63
SCARDB	1	1	3	1	5
Urban Cooperative Bank	1	0	1	2	3

(Source: NABARD Presentation at Multi-Stakeholder Consultative Workshop on Agricultural Extension Systems in Tripura at Agartala on May 30-31, 2017)

## Policies and activities

Pradhan Mantri Jan Dhan Yojana (PMJDY): As of 31 December 2016, 8,44,310 accounts (including 6,09,162 rural and 2,35,148 Urban) were opened under PMJDY to the tune of INR 755.08 crore and for 82.72 per cent of those accounts, RuPay cards were issued. To service the PMJDY accounts and to reach out to the social benefits of banking, insurance and pension to the vast section of the society, three schemes Pradhan Mantri Suraksha Bima Yojana (PMSBY), Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) and Atal Pension Yojana (APY) are being implemented since 1 June 2015.

Financial inclusion to ensure access to appropriate financial products and services by the rural people, especially vulnerable groups such as the weaker sections and low-income groups, have been a major responsibility of NABARD in Tripura. The major initiatives taken are – i. financial inclusion by NABARD has been – universal access to banking facilities; ii. Financial literacy programmes; iii. Providing basic banking accounts with overdraft facility and Rupay Debit cards; iv. Creation of Credit Guarantee Fund; v. Micro Insurance; and vi. Micro pension.

**Other NABARD initiatives:** Other than implementing policies and programmes of the Central Government, NABARD also grants assistance to Tripura Grameen Bank (TGB) to conduct digital Financial Literacy Awareness Programmes (dFLAP); to set up solar powered V-sat connectivity in sub-service areas; Issuance of EMV chip based RuPay Kisan Cards for both TGB and Tripura State Cooperative Bank (TSCB); financing deployment of PoS Terminals in Tier 5 and Tier 6 Centres; promotional grant to Joint Liability Groups (JLGs) to TGB and TSCB; for Women SHGs in West Tripura and Dhalai districts; digitization of data of SHGs on web portal [eshakti.nabard.org](http://eshakti.nabard.org); support financial literacy programmes on 'Going Digital'. NABARD has provided credit support in Tripura of INR 262 crore under RIDF and INR 146.92 crores for refinance.

**Challenges:** In spite of the initiatives taken, at the ground level, much impact has not been observed in terms of increased financial inclusion of the marginalized communities. Some of the major challenges have been:

1. Absence of viable delivery mechanism of the services to the desired clients

2. Reach and coverage of rural areas has not been up to the expected or desired level
3. Absence of banking technology makes it difficult to extend services to rural areas. Also, high transaction costs, perceived risks cost in the absence of proper risk mitigation measures, poor health of cooperatives and absence of enabling legal frameworks also pose challenges.
4. Attitude of the people as well as other stakeholders has been a challenge to increase the quality and quantity of services in the areas. Hassles with loan sanctions and procedural and documentation complexities discourage borrowers to approach the bank.
5. Lack of proper business model in the rural areas and also, lack of guidance ultimately fail to positively impact the financial inclusion initiative in rural areas

## Panchayat Samiti and Gram Panchayat

The three tier Panchayati Raj system is very active in the state. Gram panchayats are active stakeholders in agricultural development initiatives from the planning process. Every month the Panchayat arranges "Gram Samsad", a meeting with representatives of departments from agriculture and allied sector, from rural development, the Panchayat members and the villagers, to discuss the issues and decide on the way forward. Other than that, the Gram Panchayat is in charge of selection of beneficiaries for any development schemes, awareness creation and often the active link between the villagers and the department officials. And since their involvement is so high, capacity development of the Panchayat officials is a necessity for better deployment of the various projects and schemes and involving them for agricultural development of the state.

## Recommendations and implications for extension

Extension is an important component in agriculture and allied sector, in the state. Considering the diverse requirement in terms of technical and functional capacity in extension, some stakeholders (Rubber Board of India, Tripura Bamboo Mission) have proven to be exemplary while others are found to be suffering from multiple challenges. As those have been discussed in details in the earlier sections, the recommendations for more efficient extension system are discussed below:

1. **Skill development in technical and functional skills:** Many of the field staffs have either limited technical skills or functional skills or both. In case of agriculture, horticulture and other allied sectors, even the most active staff at the field level does not have technical knowledge of the sector which might limit them in being effective in the field. In terms of functional skills, in many cases the extension personnel do not have clear understanding of the capacity needed either. So, appropriate stakeholders can get involved in capacity need assessment and capacity development of the field functionaries of the state.
2. **ICT skill development:** With increased use of digitalization worldwide, there is need for increasing the ICT (Information and Communication Technology) skills of the extension personnel of the state as it serves a dual purpose of keeping them abreast with new technologies across the world and increase client and peer communication manifolds. Training programmes need to be conducted on how to use various ICT tools for the field level functionaries to keep them abreast with the new technologies.

3. **Documentation skills:** Various technologies, developed both by extension officials and farmers, have not been highlighted enough or have been lost because of lack of proper documentation. Documentation skill of the field level staff have been found to be poor and write-shops are necessary to enhance documentation skill of extension officials so the department can have an archive of innovations at the field level and refine those already existing.
4. **Online monitoring:** Documentation takes up a lot of work time for the extension personnel which they could have efficiently spent in the field. To reduce this problem, online monitoring system can be introduced and mobile technology can be integrated so that the field visits can be monitored through online rather than spending time through offline reports. This will also help in increasing accountability of field staffs. State Government can partner with appropriate stakeholders to design online monitoring systems for extension activities and partner with NIC/IT firms for creation of the system.
5. **Dedicated extension mechanism:** A dedicated extension mechanism is needed in the state in line of that of Rubber Board, for efficient technology adoption and dissemination. Increasing manpower of the state departments is one of the most essential requirements for that purpose. Increased community extension efforts/para extension workers can also help the department in its work.
6. **Beneficiary selection:** While involvement of Village Panchayat for beneficiary selection is justified, increased scrutiny of the list should be in place to ensure that the benefits goes to the right people. To have a clear understanding of what schemes require what type of beneficiaries, minimum technical understanding is required for the VLWs who generally deal with the beneficiaries. To increase their technical knowledge, T-SAMETI in association with ICAR, can conduct training programmes for VLWs and panchayat extension officers. Also, model village database maintained by the panchayat offices with details of all the inhabitants of constituent villages will help make the process more transparent.
7. **Market led agriculture:** Except for the plantation sector, market orientation is lacking in other sectors, especially horticulture and ARD where there is a large scope. Training programs needs to be conducted to create awareness among the extension personnel on how to increase market orientation and also act as a facilitator in connecting various national and international agencies with the state department for increased export of high value products. Highlighting the cases of the forestry sector can also be a lesson for others.
8. **Extension research:** There is no extension research on the current status and the required interventions. Since College of Agriculture is only having B.Sc. (Agri.) and is currently having no projects, extension research is at a standstill. Allied departments can partner with different stakeholders and take up projects in the state for an in-depth analysis of the current scenario to come out with solid set of evidences for the state government to build their policies on. In the absence of evidence based policies, extension interventions start half-heartedly without any major influence at the ground level.
9. **Interventions in ATMA:** As the State Government has not been able to recruit field level staff under ATMA, increasing the burden on the state department employees, it can associate with NGOs for the recruitment of contractual staff. This can also increase the accountability of the staff and be a solution to the payment disparity problem. It can be started on a pilot phase and based on the success achieved, can be scaled up for the whole state.

10. **Convergence:** Convergence is non-existent in the state for extension while in marketing, convergence has been observed in the plantation sector. Private sector has not been encouraged by the State Government and neither has any actor come up strongly. But even among the allied line departments, KVKs, or ICAR, convergence have not been strong, leading to treating each entity in a farmers' field as individual. Brokering strong linkages among the actors in the state and introducing the concept of farming as a business enterprise rather than just a traditional way of life is required.
11. **Farmer producer organizations (FPOs):** The state has enormous untapped potential in cultivation and export of flowers, pineapple, orange, fish and fish products, jackfruit, bamboo shoot and its processed products, etc., through farmer producer organizations. Extension personnel can be properly trained so they can facilitate the farmer producers into forming groups to produce and market their products in and outside the state with value addition.
12. **Agripreneurship and agricultural start-ups:** T-SAMETI is already a recognized Nodal Training Institute (NTI) under the Agri Clinics & Agri Business Centres (AC&ABC) Scheme of the Government of India, implemented by MANAGE. Being in North East, the state has a huge potential in agro-tourism and other innovative ventures for agricultural start-ups and agripreneurship in allied agricultural sectors which the government needs to promote. Active efforts from T-SAMETI along with the College of Agriculture, College of Veterinary Science and College of Fisheries, can help mobilize youth into entrepreneurship, thus creating a rich resource for extension advisory in agriculture and allied sector.
13. **Categorization of farmers:** A unique initiative by the Department of Fisheries was observed in categorizing of farmers based on their productivity/performance rather than the size of pond they own. This has helped in efficient disbursement of technology to the rightful people. Similar initiative can also be taken by DoA to ensure a systematic and effective distribution of technologies, subsidies and incentives.
14. **Refresher Training Programmes (RTPs):** Refresher training for department officials are needed as many of them expressed to have lost touch with recent developments in their respective fields due to heavy administrative work load. Recent technologies (ICTs) and skills (technical and functional) can be introduced while reinforcing the basics to increase the competence of the extension staff.

## Conclusion

Extension in agriculture and allied sector needs to be strengthened without doubt in Tripura state for agricultural development. Being an agrarian economy, capacity development of the extension staff is required to help farmers effectively. Convergence between line departments is essential to provide a platform for technology dissemination and sharing of good practices that exist within sectors but are not being replicated as they are not getting highlighted. Development of the North eastern states has become a priority in the recent past and considering their dependency on agriculture, extension is going to be the driving force behind this change. But success of this initiative by MANAGE will only be seen with full participation from the stakeholders of the existing extension system in the state and support from the policy makers.

## Officials contacted during the study

Extension in agriculture and allied sector needs to be strengthened without doubt in Tripura state for agricultural development. Being an agrarian economy, capacity development of the extension staff is required to help farmers effectively. Convergence between line departments is essential to provide a platform for technology dissemination and sharing of good practices that exist within sectors but are not being replicated as they are not getting highlighted. Development of the North eastern states has become a priority in the recent past and considering their dependency on agriculture, extension is going to be the driving force behind this change. But success of this initiative by MANAGE will only be seen with full participation from the stakeholders of the existing extension system in the state and support from the policy makers.

Organization	Name	Designation
Department of Agriculture	Mr. Subrata Shib	Deputy Director, Department of Agriculture, Government of Tripura
	Mr. Prabir Kumar Majumdar	Deputy Director, Department of Agriculture, Government of Tripura
	Amitava Chakraborty	Assistant Director, Department of Agriculture, Government of Tripura
Department of Horticulture	Mr. Pulak Choudhury	Deputy Director (HRS), Department of Horticulture, Government of Tripura
	Mr. Rajib De	Assistant Director, Department of Horticulture, Government of Tripura
Department of Fisheries	Mr. Rameshwar Das	Director, Department of Fisheries, Government of Tripura
	Mr. Nikhil Majumdar	Deputy Director, Department of Fisheries, Government of Tripura
	Ms. Ankana Dey	Fisheries Officer, Department of Fisheries, Government of Tripura
Animal Resource Development Department	Dr. Manoranjan Sarkar	Director, ARDD, Government of Tripura
	Dr. K. K. Majumdar	Joint Director, ARDD, Government of Tripura
T-SAMETI	Dr. Shib Prasad Majumdar	Faculty, TSAMET
ATMA, West Tripura District	Mr. Arun Bhattacharjee	PD, ATMA and Deputy Director (West Tripura), Department of Agriculture, Government of Tripura
Tripura Bamboo Mission	Mr. Kedar panda	Project Manager, TBM, IL&FS
	Mr. Rajib Saha	Cluster Coordinator-Plantation, TBM, IL&FS

<b>Organization</b>	<b>Name</b>	<b>Designation</b>
Rubber Board of India, Zonal Office, Tripura	Ms. L. Anita Devi	General Manager, Manimalyar Rubber
	Mr. Arunabha Majumdar	Manager, Manimalyar Rubber
	Mr. Sujit Acharya	Manager, Tripura Latex
	Mr. Shyamal Sen	Field Development Officer, Rubber Board of India
TFDPC	Mr. Ashok Kumar, IFS	MD, TFDPC
	Mr. Chandan Lal Das, IFS	Executive Director, TFDPC
	Mr. Kanailal Choudhury, TFS	Divisional Manager (HQ), TFDPC
	Mr. Pradeep Barman, TFS	Statistical Officer, TFDPC
KVK, Salema	Mr. Debraj Barman	Senior Scientist and Head (In-Charge)
	Ms. Bichitra Debbarma	SRF
ICAR-RC, Tripura Centre	Dr. B. K. Kandpal	Joint Director
College of Agriculture, Tripura	Dr. M. Dutta	Principal and OSD, College of Agriculture
Panchayat T-SAMETI, Salema block	Mr. Mithu Dasgupta	Panchayat Extension Officer, Salema Block, Tripura

### Workshop Recommendations

Along with the above recommendations, based on the discussions in the two-day Multi-Stakeholder Consultative Workshop, the following recommendations emerged.

#### Department of Agriculture and Horticulture

1. For agricultural development of Tripura, marketing requires due attention and with increased focus on production, market linkage also needs to be emphasized. Partnering with private companies, formation of FPOs and trade negotiations with the Bangladesh Government are to be explored. Recent introduction of railway connections to Kolkata and Guwahati can be a boon in this regard.
2. Emphasis needs to be shifted from rice and monocropping to economically remunerative crops like jackfruit, litchi, woodapple and pineapple in suitable areas and RoFR lands; establish post-harvest processing plants in collaboration with the Ministry of Commerce, Agricultural and Processed Food Products Export Development Authority (APEDA) and create state organic brands for selling in national as well as international markets.
3. Partner with NABARD for increasing financial and credit linkage, bring all the farmers under crop insurance schemes and increase financial assistance to producers for modernizing farming techniques.
4. Floriculture potential of the state is huge in high value flowers like Anthurium, Gerbera, Dendrobium orchids and exploring markets in Kolkata, Delhi and Bangladesh requires to be initiated. As the sector is still unorganized, special emphasis is required on this aspect.
5. Farmer/producer organizations in the state are in nascent stage. Strengthening existing ones and formation of more FPOs for commercial crops needs to be a priority.
6. Capacitate the extension professionals on using ICTs through need based training programmes to facilitate faster and better communication of new technologies, market price and advisory.
7. Capacity development of department staff in verbal as well as written (documentation) communication to help create archives of success stories and good practices.
8. Seeing the heavy dependence on Central Sector Schemes (CSSs) for technology, the department may need to be connected with various ICAR research centres as well as successful agripreneurs for technologies.
9. Community based extension and community level extension workers (Farmers Friend) are very much required in the state and increased honorarium will attract educated youth to participate. For this purpose, collaboration with MANAGE for youth training and collaboration with Central Government for increased fund (and increase of honorarium for Farmers' Friends) towards community extension is required.
10. Panchayati Raj Institutions at the grassroot levels have been an important partner in the past, for dissemination of agricultural technologies. Further strengthening of partnerships and collaborations needs to be explored for smarter agricultural and horticultural development.



## Department of Fisheries

1. Increased focus required on highly remunerative and high demand fish like Pabda and Hilsa and fresh water prawn which are currently being imported from Kolkata and Bangladesh. A large quantity of fish is also being imported from Andhra Pradesh, inspite of potential within the state being high. Increased focus is hence required in developing scientific methods of cultivating them in the state.
2. Develop processing facilities for fish and train farmers on homebased fish processing and this will reduce importing dried/fermented fish from Bangladesh.
3. Encouraging the production of low cost fish feed in the state and engaging private entrepreneurs for this purpose as it will reduce cost and increase self-employment in the fishery sector.
4. Encouraging entry of private sector (with required rules and regulations to protect farmers' rights) for technology intensive methods of fish rearing.
5. Collaboration of fisheries extension with research institutes like National Fisheries Development Board (NFDB), research centres, College of Fisheries, CAU, Lembucherra, and other ICAR institutes for fisheries research and development for increased access to technology and their dissemination to the farmers.
6. Convergence of schemes like MGNREGA, RKVY, IWMP and programmes like ATMA to create infrastructure for community fish culture and marketing is required.
7. Capacity development of fishery extension officers on functional as well as technical skills is required.
8. While around 1,000 SHGs are currently engaged in the state, the number needs to be increased according to the demand and potential of the sector to promote self-employment.
9. Focus should be increased on locally relevant and low cost technology for faster adoption by marginal farmers.

## Animal Resource Development Department

1. The scope of entrepreneurship in livestock sector is huge and untapped in the state and requires more directed efforts.
2. Livestock research and extension have been more or less ignored in the KVKs and so, collaboration of KVKs with ARDD needs to strengthen work on both research and extension.
3. More para-veterinary professionals at village level are required to be engaged, to provide community level support to livestock farmers, creating awareness about disease management and scientific rearing of livestock.
4. Establishment of livestock extension wing for increased focus on extension.
5. Capacity development of livestock extension professionals in technical and functional skills for better communication of technology and effective consultancy from the department.
6. Research collaboration with external institutes and national research centers are required as research infrastructure in the state is weak.
7. Livestock innovation system needs to be concentrated on for efficient collaboration of stakeholders

like ATMA, KVK, research organizations and farmers.

8. Linkages and collaboration with stakeholders from the research, production, processing and marketing arena needs to be increased for making the livestock sector commercialized, remunerative and modern as well.
9. Capacity development of vets and para-vets in ICT use, for better communication with the livestock farmers/clients.
10. Increased training programmes of para-vets and farmers on skill upgradation and setting up of units for value added products in the state, to reduce their imports at high cost.
11. Increased involvement of SHGs, especially women SHGs and encouraging backyard poultry/piggery will help to increase household income and give rural women a steady income source.
12. Develop Dairy Cooperative Societies for better leveraging of the demand of milk and milk products in the state.
13. Large scale farms at community level are needed to be established to provide employment to rural youth and increase production from the sector.

## Presentations made during the Multi-Stakeholder Consultative Workshop on Agricultural Extension Systems in Tripura at Agartala on May 30-31, 2017

Topic	Presenter	Sector
Agriculture sector in Tripura: Challenges, opportunities and interventions	Dr. D. P. Sarkar, Director, Department of Agriculture, Govt. of Tripura	Agriculture
Horticulture sector in Tripura: Challenges, opportunities and future interventions	Mr. Arun Debbarma, Director, Department of Horticulture, Govt. of Tripura	Horticulture
Extension System in Fisheries sector: Opportunities and interventions	Dr. G. R. Das, Director, Department of Fisheries, Govt. of Tripura	Fisheries
Extension strategies for development of Animal Husbandry sector in Tripura	Dr. Manoranjan Sarkar, Director, Department of Animal Resource Development Department, Govt. of Tripura	ARDD
Present status and extension strategies of Forestry sector in Tripura	Mr. Angshuman Dey Assistant Conservator of Forest, West Tripura, Govt. of Tripura	Forestry and Plantation
Role of KVK in allied extension and convergence in Dhalai District, Tripura	Mr. Debraj Barman, Senior Scientist and Head, KVK Dhalai	Allied
Role of KVK in Allied extension and convergence in North Tripura District, Tripura	Mr. A. Debnath, Senior Scientist and Head, KVK North Tripura	Allied
Role of KVK in Allied extension and convergence in Khowai Tripura District, Tripura	Dr. Deepak Nath, Senior Scientist and Head, KVK North Tripura	Allied
Role of KVK in Allied extension and convergence in South Tripura District, Tripura	Dr. Biswajit Debnath, SMS (Fisheries), KVK South Tripura	Allied
Allied extension, convergence and role of ATMA in Gomati District, Tripura	Mr. Gautam Majumdar Project Director ATMA, Gomati District	Agriculture
Allied extension, convergence and role of ATMA in Sipahijala District, Tripura	Mr. Anil Mohan Biswas Project Director, ATMA, Sipahijala District	Agriculture
Allied extension, convergence and role of ATMA in West Tripura District, Tripura	Mr. Arun Bhattacharjee Project Director, ATMA, West Tripura District	Agriculture
Allied extension, convergence and role of ATMA in Khowai District, Tripura	Mr. Sangram Das Project Director, ATMA, Khowai District	Agriculture

<b>Topic</b>	<b>Presenter</b>	<b>Sector</b>
Financial inclusion: Convergence and role of NABARD in Tripura	Mr. K. Venugopal General Manager, NABARD, Tripura Regional Office	Finance
mKrishi: Digital farming platform and services	Mr. Rajesh Urkude Tata Consultancy Services	Private sector, with focus on FPOs and ICTs

## Multi-stakeholder Consultative Workshop on Extension Systems in Tripura

Agartala, 30-31 May 2017

Time	Duration	Particulars
<b>Day 1: May 30, 2017</b>		
<b>Session I: Inauguration</b>		
1100-1105	05 minutes	Welcome address by Dr. D. P. Sarkar, Director, Department of Agriculture, Tripura
1105-1115	10 minutes	Opening remarks and purpose of the workshop by Smt. V. Usha Rani, IAS, Director General, MANAGE
1115-1125	10 minutes	Current state of agriculture in Tripura State by Dr. G.S.G Ayyanger, Principal Secretary, Ministry of Agriculture, Government of Tripura
1125-1140	15 minutes	Inaugural address by Shri Aghore Debbarma, Minister of Agriculture, Tripura
1140-1145	05 minutes	Vote of thanks by Dr. Saravanan Raj, Director (Agril. Extn.), MANAGE
1145-1200	15 minutes	Introduction of the participants
1200-1230	30 minutes	<i>Networking and tea</i>
<b>Session II: Extension Systems in Tripura</b>		
<b>The session aims to highlight the major extension activities of agriculture and allied sector in Tripura</b>		
<b>Chairman: Smt. V. Usha Rani, Director General, MANAGE, Hyderabad</b>		
<b>Rapporteur: Mr. Subrata Shib, Assistant Director, Department of Agriculture, Govt. of Tripura</b>		
1230-1250	15 minutes	Presentation 1: Agriculture Sector in Tripura: Challenges, opportunities and future interventions by Dr. D. P. Sarkar, Director, Department of Agriculture, Tripura
	05 minutes	Q&A
1250-1350	60 minutes	<b>Lunch Break</b>
1350-1410	15 minutes	Presentation 2: Horticulture Sector in Tripura: Challenges, opportunities and future interventions by Shri Arun Debbarma, Director, Department of Horticulture, Government of Tripura
	05 minutes	Q&A
1410-1430	15 minutes	Presentation 3: Extension Systems in Fisheries sector: Challenges, opportunities and interventions by Shri Rameshwar Das, IAS, Secretary, Department of Fisheries, Tripura
	05 minutes	Q&A
1430-1450	15 minutes	Presentation 4: Extension Systems in Animal Resource Development: Challenges, opportunities and interventions by Shri Manik Lal Dey, Special Secretary, ARDD, Tripura
	05 minutes	Q&A

1450-1510	15 minutes	Presentation 5: Extension Systems in Forestry and Plantation sector: Challenges, opportunities and interventions by Shri S. Talukdar, IFS, PCCF and HoFF, Tripura
	05minutes	Q&A
1510-1530	15 minutes	Presentation 6: Extension efforts of ICAR-RC for NEH Region, Tripura Centre in Agriculture and Allied Sector by Dr. B. K. Kandpal, Joint Director, ICAR-RC for NEH Region, Tripura Centre
	05minutes	Q&A
1530-1540	10 minutes	Closing of session 1
1540-1600	20 minutes	<i>Tea Break</i>

### Session III: Group discussions

The session aims to initiate discussion on the extension scenario of agricultural and allied sectors and initiate discussions on them

**Chairman: Dr. Pramod Kumar Pandey, Dean, College of Fisheries, CAU, Lembucherra**

**Rapporteur: Dharmendra Debbarma, Assistant Professor, College of Agriculture, Tripura**

1600-1700	60 minutes	Group discussion and preparation of presentation following the prescribed framework
1700-1730	60 minutes	Plenary

### Day 2: May 31, 2017

#### Session IV: Convergence in Extension

**Chairman: Shri M. L. Dey, Secretary, Animal Resource Development Department, Govt. of Tripura**

**Rapporteur: Dr. Deepak Nath, Senior Scientist and Head, KVK Divyodaya, Khowai Tripura**

1000-1030	30 minutes	Recap of Day 1
1030-1045	10 minutes	Presentation 7: Role of KVKs in allied extension and convergence in Tripura by Senior Scientist and Head, KVK, Salema, Dhalai Tripura
	05 minutes	Q&A
1045-1100	10 minutes	Presentation 8: Allied extension, convergence and role of ATMA in Tripura by Project Director, ATMA
	05 minutes	Q&A
1100-1115	10 minutes	Presentation 9: Role of KVKs in allied extension and convergence in Tripura by Senior Scientist and Head, KVK, Divyodaya, West Tripura
	05 minutes	Q&A
1115-1130	10 minutes	Presentation 10: Allied extension, convergence and role of ATMA in Tripura by Project Director, ATMA
	05 minutes	Q&A
1130-1145	15 minutes	<i>Tea Break</i>
1145-1200	10 minutes	Presentation 11: Financial inclusion, convergence and role of NAABRD in Tripura by General Manager, NABARD, Tripura Regional Office
	05 minutes	Q&A
1200-1215	10 minutes	Presentation 12: Role of KVKs in allied extension and convergence in Tripura by Senior Scientist and Head, KVK, Panisagar, West Tripura
	05 minutes	Q&A

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1215-1230	10 minutes	Presentation 13: Allied extension, convergence and role of ATMA in Tripura by Project Director, ATMA
	05 minutes	Q&A
1230-1245	10 minutes	Presentation 14: Role of KVKs in allied extension and convergence in Tripura by Senior Scientist and Head, KVK, Birchanda Manu, South Tripura
	05 minutes	Q&A
1245-1300	10 minutes	Presentation 15: Allied extension, convergence and role of ATMA in Tripura by Project Director, ATMA
	05 minutes	Q&A
1300-1400	60 minutes	<i>Lunch Break</i>

**Session V: Action plan and plenary**

**Chairman: Dr. Saravanan Raj, Director (Agril. Extn.), MANAGE, Hyderabad**  
**Rapporteur: Shri Arun Bhattacharjee, Project Director, ATMA, West Tripura**

1400-1500	60 minutes	Group exercise: World Café
1500-1600	60 minutes	Presentation and Plenary
1600-1700	60 minutes	Valediction

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## List of participants

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