National Agro Foundation

Annual Report 2018-19

Theme of the Year:

"Water Security in a Changing Climate"

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Message from Managing Trustee

Dear Friends,

It is my honour to present to you the annual report of National Agro Foundation (NAF) for the financial year 2018-19.

Since its inception, NAF has been an organization which is continuously refining its focus areas and expertise with an overarching goal of achieving sustainable agricultural development - and to cope with the evolving problem landscape of agriculture sector.

Themes of last three-year annual reports are Promoting farmers' welfare through farmer producer organizations (FPOs), Creating a sustainability road map for rural prosperity within local ecosystems and Achieving Global goals through local actions. This is indicative of NAF's efforts to address the contemporary problems and the forward-looking actions.

Annual report of the year of review is titles as "Water Security in a Changing Climate". As the title suggests, the main focus of last year was to conserve, rejuvenate and judiciously use the natural resources through our Watershed Development Division. NAF's 34 Watershed Development Projects (WDP) across 7 states of the country addressed the water crisis at grassroots level in 140 villages. In this report, you will find the status and benefits of every WDP implemented by NAF. The impact of NAF's WDP is evident from the sustained productivity of the agriculture in the intervened watersheds, despite 2018-19 being a drought year.

NAF's strategic priorities are clear and integrated. They are Climate proofed Watershed Development, Market oriented agricultural development, empowerment focused training & Capacity building and Affordable laboratory services. These strategic priorities are linked by a common theme Sustainable Agricultural Development.

NAF's collaborative efforts with corporates, government agencies, research organizations, other NGOs and financial institutions are the building blocks of our strength. NAF and its partners utilize their mutual strengths for the benefit of the farmers and rural society.

Among the highlights of this year was the creation of Agri-business Development Division, dedicated for the formation, nurturing and strengthening of FPOs through business development trainings, credit and market linkages and business process digitalization. Agri-business Development Division's core aim is to make agriculture a profitable business with incessant support from our other divisions.

Last year while NAF had given thrust to our ambitious vision to create a healthy, literate and prosperous rural India, NAF actively involved in restoring the faith in humanity through our disaster relief activities during Gaja cyclone and Kerala Floods through our Social Development Division. Over 2000 families belonging to marginal communities of our society benefitted through NAF's relief activities. Beyond carrying out immediate disaster relief activities, NAF has also played a crucial role in rejuvenation and reclamation of villages in

Kanchipuram District affected by 2015 floods. Recognizing NAF's commendable work in post flood reclamation activities, Madras Chamber of Commerce and Industry (MCCI) awarded us the runners-up award for the best CSR project for the year 2018.

I would like to take this opportunity to thank the government departments, our corporate partners and donors for your support and for placing your confidence in us, without which our achievements would not have been possible. I would especially like to thank our Board Members for their contribution, particularly when we needed to find solutions at strategic level.

Our work ahead is to build on this progress, continuously learn, and strengthen our capabilities to bring change in the lives of our beneficiaries. NAF has a strong pipeline of projects in coming years. It is in this context; I solicit the continuous support of every stakeholder to be a part of building a thriving future.

I hope every section of this report will be worth a read filled with exciting success stories that narrate the perseverance of our determined staff, supportive community partners and enthusiastic volunteers. I invite you to read this Annual Report in detail to understand our humble efforts and results achieved last year.

Happy reading!

S.S. Rajsekar

Managing Trustee

About Us

National Agro Foundation (NAF) was established in the year 2000 by the Architect of Indian Green Revolution, Shri C Subramaniam, and was further nurtured by Former President Dr A P J Abdul Kalam (as Chairman of NAF Governing Council), for comprehensive rural development with prime focus on transforming the direction of the Indian agriculture from "production oriented" to "market-oriented" or in the words of Our Founder from 'seed to grain' to 'soil to market'.

Our Vision

To create a "Healthy, Literate and Prosperous Rural India"

Our Mission

"Creating replicable models of prosperous rural clusters through ecologically safe, environmentally sustainable farm and non-farm sector activities, natural resource management, rural enterprises and human resource development by networking various stakeholders through mutually beneficial partnerships."

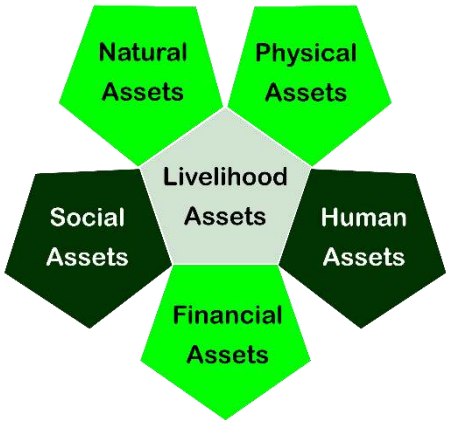
Strategy Highlights

4E Approach:

NAF believes that sustainable development is about recognising, understanding and acting on the interconnections between the thematic areas of Education, Environment, Economy and Empowerment.

Sustainable Livelihoods Approach:

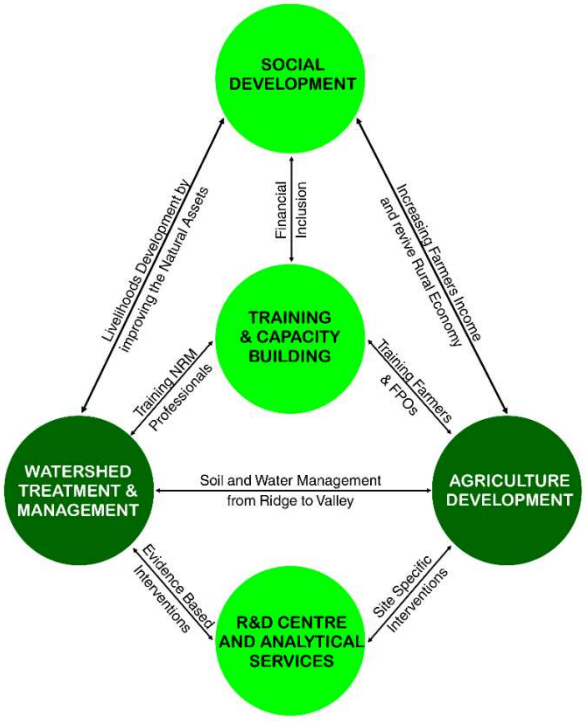
The idea of assets is central to the sustainable livelihoods approach. Rather than understanding poverty as simply a lack of income, the sustainable livelihoods approach considers the assets that poor people need in order to sustain an adequate income to live.



- Natural Assets—Watershed Management, Natural Resource Management, Flood Mitigation, etc.
- Physical Assets—Food Processing centres, Resource centres, Rural Infrastructure, Training Centres, etc.
- Social Assets—Watershed Management Committees, Farmers Organisations, SHGs & JLGs, Farmers Club, etc.
- Human Assets—Training & Capacity Building, Frontline Demonstrations, Village Resource Persons, Training Students and Professionals, etc.
- Financial Assets—Access to credit, Bank Linkages, Grants, Revolving Funds, etc.

Holistic Approach:

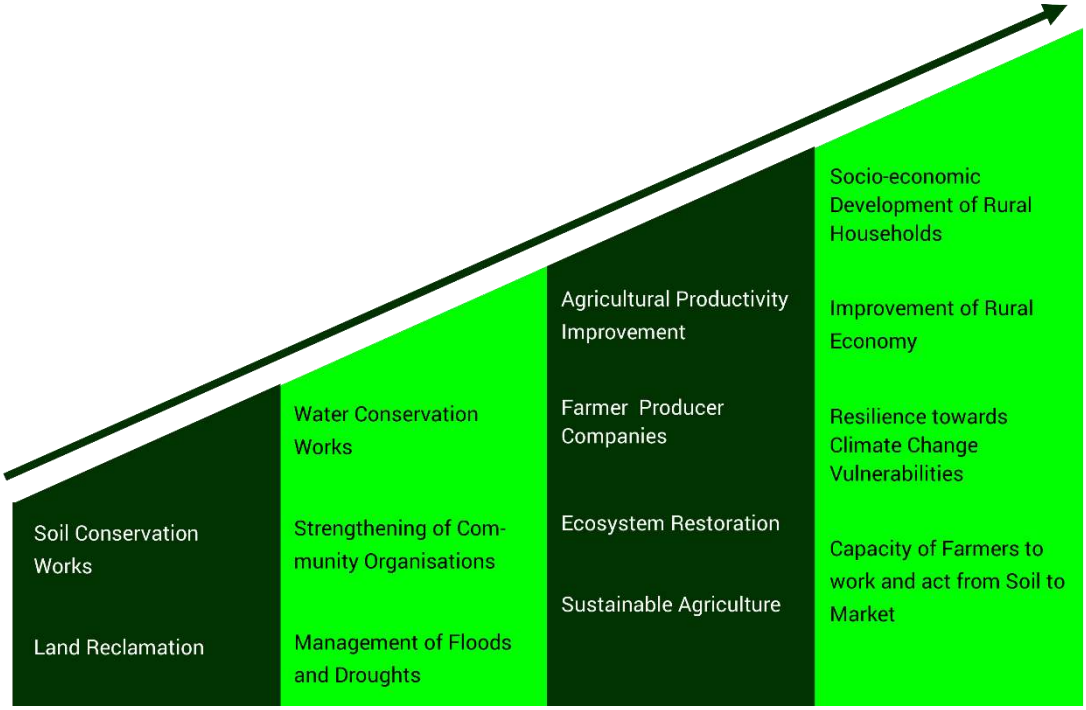
The integration of watershed management efforts with that of other areas such as agricultural development, social development, etc., incorporating cutting edge science and technology, and extensive training and capacity building activities.



Holistic Approach Diagram

Sequential Approach:

All developmental areas are included in a sequential process of development and interventions are made in order. Each developmental area is considered separately and also integrated around a unifying theme to which all of the activities are connected.



Sequential Approach Diagram

Working Divisions and Various Associated Activities

Agricultural Development Division – Farm Mechanisation, Sustainable Climate Smart Agriculture, Knowledge and Technology Partner, Implementation of Projects, Action Research, etc.

Watershed Development Division - Natural Resource Management, Watershed Development, Soil and Water Conservation, Climate Change adaptation and mitigation, Promotion of Agro Forestry, Rehabilitation of areas affected by flood disaster, etc.

Training and Capacity Building Division - Training and Capacity building for adoption of Sustainable Agriculture practices, Organic farming, Lean Farming, Climate Smart Agriculture, Agri Clinic and Agri Business training, Agricultural Technology training, Micro Enterprise Development, Awareness programmes, etc.

Social Development Division - Community Mobilisation, Financial Inclusion, Livelihoods, Entrepreneurship, Promoting formation and Supporting Self-help Groups, etc.

Laboratory Services Division - Technology and analytical services for food and agriculture development covering soil, food quality & safety analysis, training research and academic programmes, etc.

Agri-Business Development Division – Formation & Development FPOs, Agri-business trainings, Digitisation of FPO Business Operations, FPO Credit & Market Linkages, Rural Entrepreneurship etc.

Achievements in Numbers

OUTPUT

Number of agriculture and rural development projects implemented **110**	Number of states (provincial territories) covered **15**	Number of households reached **78000+**	Number of villages reached **836**
Agri-preneurs (Agriculture Entrepreneurs) trained **925**	Number of Farmers trained **75000+**	Number of Farmer Producer Companies (FPCs) promoted **43**	Number of comprehensive soil analysis done **26510**
Total area treated through watershed Development projects **24828 Ha**	Number of soil and water management interventions made **300+**	Number of agricultural demonstration field established **2467**	Number of partner organisations **40+**

OUTCOME

Productivity levels of various crops increased by **32 - 57%**	Profit of farmers increased by **89 – 106%**	Milk productivity of the dairy farmers increased by **300%**
Number of micro enterprise setup in rural and agri sector **500+**	Number of grassroot level community organisations formed **500+**	Average increase in water table in the project areas Bore-well **110-120 ft.** Open-well **6-7.5 ft.**

Watershed Development Division

If ecology, economy, agriculture and society are the branches of the tree of sustainable rural development, then watershed is its root, especially in a largely rain-fed agriculture scenario like India. Hence, NAF has identified Watershed Development Program as an appropriate and important feature of its rural revitalisation programs to manage common natural resources and enable sustainable livelihood to the rural poor.

According to TERI's report, 2017, agricultural sector accounts for more than 80% of all the water consumed in the country. Given the ever-growing population and the need to feed the last hungry soul of our nation, agricultural sector's mammoth thirst for water will be insatiable without emergency actions.

Central Research Institute for Dryland Agriculture's report, 2013, states that rain-fed agriculture occupies 67% of sown area, contributing 44% of food grains and supporting 40% of population. Referring to the IMD data, in the recent years, the annual rainfall of the country has been above average. This excess rainfall still hasn't changed the scenes of drought ridden summers in the internal parts of the country. Rather, the scarcity of water during lean seasons is increasing every year. This is due to the lack of infrastructure to store water during monsoon and utilise them during lean seasons.

On the other hand, the availability of underground water is also depleting because of the exploitation of the underground water table by uncontrolled withdrawal and lack of underground water restoration mechanisms.

Climate change is another challenge that faces our country. IPCC's 2018 report has identified India as one among the most vulnerable countries to climate change. Dynamically changing weather patterns caused by multiple factors such as global warming, pollution, change in ocean currents etc., leads to intense cyclones, unprecedented rainfall, floods and other climate induced disasters. These disasters result in soil erosion, damage to the crops and destruction of the fields.

The poor state of water management in the country along with climate change shakes the food security and stands as an obstacle in the growth and development, of the nation. In these circumstances, watershed development stands as the panacea for a prosperous and thriving future.

NAF approaches watershed development in a holistic manner, which incorporates all the three dimensions of sustainable development identified by United Nations, i.e. Environmental sustainability, Economic sustainability and Social sustainability.

NAF's Watershed team along with the support from our corporate partners effectively manages the biophysical, socioeconomic and institutional components of the watersheds through a multidisciplinary & multi-sectoral approach, using scientific knowledge from different fields and a combination of traditional wisdom and modern technologies, strategies, and techniques to create maximum possible benefit for the dependent people.

Projects

The watershed projects are supported by government agencies and corporates with the aim of natural resource conservation and enhancement of income and livelihood of the farmers. The supporters in this goal are NABARD and CSR initiatives of Larsen & Toubro, Bannari Amman Sugars, VA Tech Wabag, Titan, Rotary International BNY Mellon, Epsilon Chemicals, L&T Tech services, Oerlikon and Asian paints. Currently, NAF is working on 34 projects with watershed management as its goal and is being implemented in 7 states of the country covering 140 villages, encompassing 31533.56 hectares and benefiting 46954 families.

Summary of all watershed projects

- 140 villages reached through the watershed projects
- 12723 hectares have been treated out of 31533.56 hectares total treatable area and which has benefited 46954 families till March 2019
- 61 check dams constructed in different watershed locations
- 138 farm ponds excavated and 73 water bodies rejuvenated
- Water conserved during the reporting period is 0.163 TMC and cumulative of 0.495 TMC (14017.87)
- Ground Water level improved in wells and open wells up to ten feet
- 980 hectares of fallow land brought back in to cultivation.
- Cropping intensity doubled on 473.76 hectares up to March 2019
- Agriculture productivity enhanced to 150% in demo fields
- 657 families have been supported through financial support to their livelihood activities with INR 196.84 lakh of revolving method from the seed money of INR 37.73 lakh up to March 2019
- The corpus fund augmented to INR 31.1 lakh through farmers' contribution for post project maintenance as on August 2018
- 63903 human days of employee created with INR 172.9 lakh wage payment

Watershed Development Project Phases

NAF implemented watershed projects under NABARD, State government and corporates. These projects has following phases,

Pre capacity building phase

i. Community mobilization, capacity building and institutional set up

b. Capacity building

i. Treatment measures in 10% of the project area for adopting the local community in to the project fold. Learning can be applied in the Full implementation phase

c. Feasibility study phase

i. Comprehensive development plan for the entire watershed including soil, water, crops, afforestation, agriculture, community, livestock etc.

d. Full implementation
   i. Comprehensive development
   ii. Integrated community approach
   iii. Participatory implementation
   iv. Inclusive development works with land less and SHG
   v. Adoption of technology through various trainings
   vi. On field demonstration in project villages
   vii. Sustainability plan with corpus fund development

1) Kolwadi watershed – L&T Technology Services

L&T Technology services supported for a watershed project in Kolwadi village cluster in Velhe block of Pune district, Maharashtra. The duration of the project is 3.5 years and was initiated in September 2016 and was to be competed in March 2020 as per the MoU.

The total outlay of the project is INR 198.5 Lakhs. However, due to conducive field conditions and regular fund flow, majority of the activities have been completed well in advance and INR 165 lakhs have been expended. The project is likely to be completed by April 2019 itself.

2) Integrated Community Development Project in Coimbatore - L&T CSR

Larsen and Toubro has supported two watershed project in Coimbatore district, Tamil Nadu in Chettipalayam and Pappampatti villages. The duration of the project is 3½ years starting from April 2015 to September 2018. The total outlay of the project is INR 267.36 Lakhs. The project is completed. Realizing the benefits of the project, L&T has sanctioned an additional budget of INR 80 lakhs for undertaking additional interventions such as

additional check dams, farm ponds, field bunds and related water harvesting structures. These additional interventions were completed by March 2019. In addition to this, L&T has

requested NAF to undertake sustainability development project along with sanitation project for two more years starting from April 2019 to March 2021. The total outlay of the sanitation project is INR 450 Lakhs.

3) Kokkaranthangal – L&T Technology Services

Observing the impact of watershed project in Pune in the first year, L&T Technology Services sanctioned another project in Kokkaranthangal cluster of villages in Chithamur block, Kancheepuram district, Tamil Nadu. The four year project commenced in July 2017. The total outlay of the project is INR 192.22 Lakhs, of which activities worth INR 108 Lakhs has been implemented as on March 2019 which implies that about sixty percent of the envisaged project activities have been completed in the first one and half years.

4) Edaiyur Watershed – M/s Tata Capital

M/s Tata Capital supported a watershed project in Edaiyur village, Thirukazhukunram block, Kancheepuram district, Tamil Nadu. The three and half duration project was initiated in October 2017 and is expected to be completed by March 2021.The total outlay of the project is INR 195 Lakhs of which activities worth INR 110 Lakhs, which is sixty percent of the total budget, has been expended as per

the project plan in the first one and half years by March 2019 due to conducive atmosphere and enthusiastic participation of the partnering watershed community.

5) NABARD Watershed at Kancheepuram district

NABARD and Government of Tamil Nadu have supported four watershed projects viz., Arasur, Nugumbal, Sirukalathur and Othivilagam in Kancheepuram district. The total outlay of these four projects is 463 Lakhs. The four projects have the following phases and all the phases have been completed successfully.

6) KN Palayam WS – M/s Bannari Amman Sugars

Bannari Amman Sugars limited supported a watershed project in Erode district of Tamil Nadu at n KN Palayam village. The project was initiated in October 2016 and has the following phases with its time line and status.

Phase	Duration	Status
Pre capacity building phase	3 months	Completed
Capacity building	1 year	Completed
Feasibility study phase	6 months	Completed

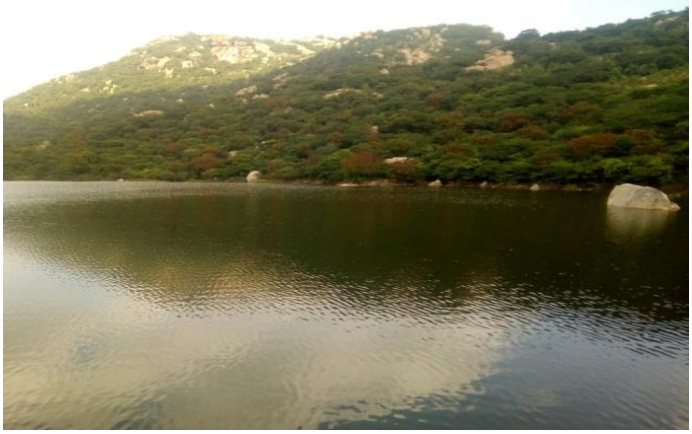
7) Melpennathur – M/s Bannari Amman Sugars

Bannari Amman Sugars limited has also supported one more watershed project in Melpennathur village, Thiruvannamalai district, Tamil Nadu. The project commenced in January 2018, with the following phases, timeline and status.

Phase	Duration	Status
Pre capacity building phase	3 months	Completed
Capacity building	1 year	Completed
Feasibility study phase	6 months	Completed

8) Kupachiparai – M/s Rotary International and various Rotary Clubs

Rotary International has supported a watershed project in in Kupachiparai village, Krishnagiri district, Tamil Nadu. The project was initiated in Oct 2016 and the following are the phases being implemented with time line with the status. The capacity building phase is completed for which INR 14.95 Lakhs was sanctioned.



Phase	Duration	Status
Pre capacity building phase	3 months	Completed
Capacity building	1 year	Completed
Feasibility study phase	6 months	Completed

9) Pulleri – M/s VA TECH WABAG

VA Tech WABAG extended financial support supported for a watershed project in Pulleri village, Thirukazhukundram block, Kancheepuram district, Tamil Nadu in October 2016. The following are the phases being implemented with time line and status.

Phase	Duration	Status
Pre capacity building phase	3 months	Completed
Capacity building	1 year	In progress
Feasibility study phase	6 months	Completed

10) Cuddalore WS – M/s Titan Company Limited

Titan Company Limited supported four watershed projects in Cuddalore district of Tamil Nadu viz., Kotteri, and Narumanam villages in Vridhachalam block and Kolathankurichi and Thandakarankuppam villages in Kattumannarkoil block. These projects commenced in January 2018, with the following phases and timeline.

Phase	Duration	Status
Pre capacity building phase	3 months	Completed
Capacity building	1 year	In progress
Feasibility study phase	6 months	Completed

The capacity building phase is nearing completion with ninety percent of the INR 58.57 Lakhs sanctioned expended as of March 2019.

11) Climate Proofing Project

Agriculture is estimated to account for 10–12 percent of global greenhouse gas (GHG) emissions and is responsible for 47% and 58% of total anthropogenic emissions of Methane and Nitrous Oxide, respectively.

On the successful completion of watershed projects in Arasur, Nugumbal, Othivilagam and Sirukalathur watersheds in Kanchipuram district, Tamil Nadu, NABARD has sanctioned the WDF - Climate Proofing project to NAF. The total cost of the project including management cost is INR Two Crore.

The specific objectives of the climate proofing project are-

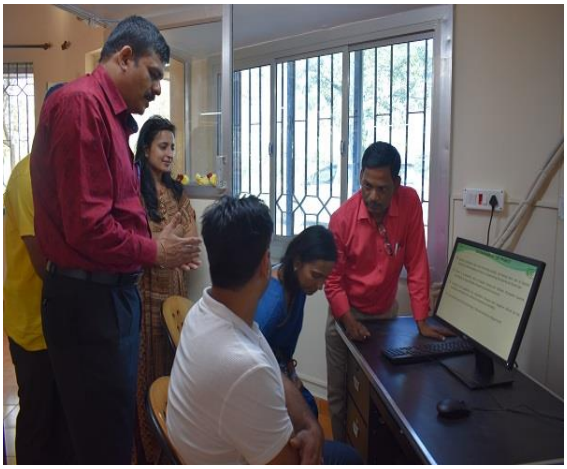
i. Improving adaptation to climate variability / change in farm sector with better management and maintenance of soil and water regime enabling better crop / pasture land productivity and resultant increase in income of small and marginal farmers
ii. Promoting climate resilient farming system and diversification of livelihoods engaging community and their associations in the concrete adaptation pathway
iii. Reducing climate change vulnerability and process of marginalization with integration of risk mitigation products, like crop, weather and market advisory; and information system

The project components include

- Establishment of micro weather station and crop advisory
- Promotion of green manuring, soil health management and promotion of stress tolerance varieties
- Crop diversification
- Promotion of crop insurance

- Promotion of organic inputs through establishment of models such as vermicompost, organic extracts etc.
- Training and capacity building
- Tree plantation

12) Information Technology Enabled Natural Resources Management Project



This pilot project aims at leveraging the Information & Communication Technology (ICT) for managing the natural resources created out of watershed projects as well as to monitor the status of natural resources such as soil, water, air and crop. The project components include continuous monitoring of surface as well as ground-water, green cover, cropping pattern and its change as well as sensor-based irrigation at a watershed level. Micro-weather station based agricultural advisory services including weather modeling also forms the part of the project. It is also planned to monitor the greenhouse gases emission arising out of different cropping systems. An app is also being developed to offer user-friendly advisory services to the farming in the rural community for safe-guarding the natural resources.

New Projects

Water augumentation project under Asian Paints Ltd.

M/s Asian Paints Limited is supporting four watershed projects in Karnataka, Telangana, Uttar Pradesh and Haryana states with a total project outlay of INR 263 Lakhs. These projects were started in February 2019 and till now INR 75 lakhs has been utilized in all the four projects namely Rohtak in Haryana, Kasna in Uttarpradesh, Chinnakanjrala in Telengana and Nanjankud in Karnataka.

Agricultural Development Division

Given the fact that more than 60% of India's population is dependent on agricultural sector for their livelihoods, the importance of agriculture cannot be overemphasized. Ironically, the sector accounts only for about 17% of GDP of the nation. This is due to various factors including rapidly changing climate, ever increasing pollution, exponential growth of urbanisation, poor water resource management, conventional methods of farming etc.

Income is the most relevant measure to assess farmers' economic wellbeing and sectoral transformation. The government through its focus and strong policy thrust proposes to double the farmers' income by 2022, which would mark the platinum jubilee of the Indian independence. This concentration will add on to the nation's economic stability and food security.

NAF realises that, through enabling farmers to practise climate smart Lean Farming technologies and simultaneously empowering them with necessary business skills, agriculture can become the most profitable sector of our nation's economy. With the latest advancements in farming technologies, the potential of agriculture becoming the most profitable business in the country is not an exaggerated vision.

To strengthen this crucial agricultural system, and to contribute towards Agriculture related Sustainable Development Goals (SDGs), NAF focusses on key challenges like environmental degradation, climate change related issues, increased usage of chemical inputs, market imperfections & volatilities, price fluctuations, sustainability issues, the poor skill level of farmers and lack of rural infrastructure.

Our intervention model attempts broadly to make farming system economically viable and ecologically sustainable. In addition, every effort of our implementation team strives to involve the targeted beneficiaries from the project-planning phase to the project exit phase creating and nurturing a sustainably lasting model.

Projects

NAF has been promoting sustainable agriculture through Lean Farming techniques, which is a combination of organic, bio, and inorganic approach towards climate change adaptation and mitigation measures which is economically viable, environmentally safe and ecologically sustainable. The mode of operation is through Field Level Demonstration (FLD) to encourage farmers to observe the changes that takes place in terms of soil health, pest and disease management, productivity and thus be encouraged to replicate in their own farms. These initiatives are undertaken with support from various stakeholders including the Government and Corporate sector agencies.

1) Sustainable Agriculture Projects - M/s Apollo Tyres Foundation

NAF, in collaboration with Apollo Tyres Foundation (ATF) is implementing projects to enhance the productivity and income of the farm and farmers in selected villages of Tamil Nadu and Andhra Pradesh. The Sustainable Agriculture project is implemented in four sites in the two states and it also includes a specific project for training the farmers. The operational areas of the Apollo Tyres Foundation is given in the following table.

S No.	Project	Project villages	Block	District	State
1	Sustainable Agriculture	Eraiyur	Sriperumbudur	Kancheepuram	Tamil Nadu
2	Sustainable Agriculture	Vallam	Sriperumbudur	Kancheepuram	Tamil Nadu
3	Project on Farmers Training	Kadaisikulam & Kallanguthu	Vandavasi	Thiruvannamalai	Tamil Nadu
4	Sustainable Agriculture	Chinnapandur & Racherla Panchayats	Varadaiahpalem	Chithoor	Andhra Pradesh

a) Sustainable Agriculture Project in Tamil Nadu

Eraiyur village: The project includes components such as training, frontline demonstration, establishment of models, and creation of infrastructure. A one day technical training was imparted at the Centre for Rural Development, NAF, Illedu to equip the farmers with Lean Farming Technologies. Awareness program for Farmers club members was conducted at Eraiyur village on Agri Waste Management, Climate Smart Agriculture, Improved Methods of Paddy Cultivation, Weed Management, Water management, seed treatment and effective utilisation of nutrients. Two preseason camps and two field day programs were conducted. Models such as vermicomposting units and organic formulations unit were established in Eraiyur village for supply of organic inputs within the village.

To ease plant protection measures, two power sprayers have been provided to the Farmers Club.

Desilting of the irrigation canal was also done to a length of 1992 metres with a volume of 1893 cubicmetre.15 FLDs were established in paddy. Crop advisory services were extended to the farmers.

The average yield in the demo field was 2850 kg/acre in comparison to 2415 kg/acre in the control field. The percentage increase in yield is 18 and profit is 87.

Vallam village: Similarly, here the project components include training, frontline demonstration, establishment of models, and creation of infrastructure. As part of the project implementation, Farmers Clubs were formed (Vivekanandar Farmers Club) to disseminate new knowledge and skills to improve the farming. An intensive technical training was conducted at NAF Training Centre, Illedu to provide complete knowledge on Lean farming Technologies. Models such as azolla and vermicomposting units were established in Vallam village for supply of organic inputs within the village. Two preseason camps were conducted. To enrich soil organic content, green manure seeds were provided to the members of the Farmers Club.

Thirteen FLDs were established in paddy and two with ash gourd. Crop advisory services were extended. The yield improvement in paddy has been 17.36% and in ash gourd to 49.5%, whereas the profit increase in the demo field was over 104.9% and 103.2% respectively.

b) Farmers Training Project in Tamil Nadu

Apollo Tyres Foundation (ATF) is directly implementing a tree planting program in Vandavasi taluk of Thiruvannamalai District. As value addition to the project, ATF sanctioned a project to improve the livelihood of farmers in selected villages of Vandavasi Taluk through increasing their knowledge, skills and capacities. The project is being implemented in Kallankuthu and Kadaisikulam villages from July 2018 onwards. The project has components such as training, frontline demonstration, kitchen garden and establishment of models. Three-day Intensive technical trainings was conducted to the lead farmers to educate them on lean farming techniques. Trainings were conducted to create awareness amongst the farmers about the functions and activities of Farmers Club in the two villages. In addition, exposure visits to NAF CFRD were also organized for the orientation of farmers towards scientific farming practices.

Importance of soil testing and different methods of soil sampling were explained to

the farmers by NAF experts. Green manuring kit was distributed to the trainees to increase soil health. In total, twenty FLDs were established. Yield improvement of 32% in groundnut and 57% in vegetables leading to respective profit increase of 89% and 106% was demonstrated as a result of various strategies adopted to reduce the unit cost of production.

c) Sustainable Agriculture Project in Andhra Pradesh

The Sustainable Agriculture project is also being implemented in Andhra Pradesh in the new plant area of Chinnapandur and Racherla panchayats, Chithoor district. This project commenced in October 2018. The major components of this project are training, preseason camps, Front Line Demonstrations, green manuring, establishment of vermicompost and azolla models, important farm equipment, soil health card, GIS mapping of soil nutrient status etc.

Three Farmers Clubs have been formed in three major villages. An intensive technical training was conducted to the Farmers club members at CFRD to make them aware on Lean Farming Technologies. Under livestock development, training on cattle management, cattle camps were conducted. Fodder kits were also distributed as additional source of fodder.

Twenty five Front Line Demonstrations were established. From the harvested FLDs, watermelon crop saw an average yield increase of 23.08 % and average profit increase of 45.83 %.

The total budget is INR 22.46 Lakhs out of which INR 17.94 Lakhs has been utilized.

2) Water and Agriculture Development Projects - M/s Oerlikon Friction Systems

NAF is implementing Water and Agriculture Development Initiatives (WADI) projects in Tamil Nadu and Pune District under the CSR support of M/s Oerlikon Friction Systems. The two-year project commenced from April 2017.

a) Water and Agriculture Development (WAD) in Tamil Nadu

WAD project is implemented in three villages of Thiruvallur district since 2017. The villages include Perumalkuppam, Chinambedu and Pondavakkam where Intensive Technical

Trainings were completed at the beginning of the project. To manage water deficit, drip irrigation system was laid in nine farmers' fields with government subsidy. Farm equipment like power weeders, manual weeders and sprayers were also provided to the Farmers' Clubs of the three project villages. Fifteen FLDs have been established for various crops including paddy and different vegetables. Soil analysis has been done for all the farmers and critical inputs have been provided to them. In the FLD units, bottle gourd has an average yield increase of 12% and profit increase of 58.51%.The project outlay for the current year is 10.78 lakhs, of which INR 8.96 has been utilized.

b) Water and Agriculture Development (WAD) in Maharashtra

In Pune district, four villages Adavali, Karanjawane, Askavadi and Kodavadi in Velhe Taluk in Pune district were selected to implement Water and Agriculture initiatives. The one and half year project commenced in April 2018. With a current year budget of 24.51 lakhs, INR 23.66 lakhs has been expended on the following works at the project sites.

- Farmers Institution -Four Farmers Clubs were formed in the four project villages to bring the farmers under a single platform. Monthly meetings are conducted by the Farmers Clubs to discuss their views and issues for the way forward. Beneficiary selection for the project component was made by the respective Farmers Clubs.
- Awareness program - Awareness program were conducted in the villages to sensitize the people on different agricultural technologies, various methods of seed treatment to improve seed purity and seed health were demonstrated.
- Preseason camp - Preseason camps were conducted to prepare the farmers well in advance for planning, input mobilization and familiarization on package of practices. Two preseason camps have been conducted at Kodavadi and Karanjawane village.
- Intensive technical training - Intensive technical training on resource conserving Lean Farming technologies was imparted to 25 lead farmers of the project villages at NAF Training Centre, Illedu.

- Frontline Demonstrations - Seven front line demonstrations (FLD) have been established for paddy as major crop in Kodavadi village. Soil test was done in all FLD fields and critical inputs were provided. The yield and economics have been documented. FLD results showed incremental increase in yield and profit. The average yield was 1778 kg/acre in demo fields, whereas it was 1414 kg in the control field. The yield increase was 26% with a profit increase of 21%.
- Field monitoring and Expert advice - All the FLDs are regularly monitored by field coordinators. The agriculture experts also visit the FLDs and provide need-based field advises to the farmers on nursery preparation, quality seed separation, main field preparation, precautionary measures to be followed to avoid pest infestation, etc.
- Water Development Activities -As per the farmers' request, rejuvenation of village pond and irrigation channel cleaning has been completed. A check dam being constructed is in progress.

3) Economic Empowerment of FPOs - BNY Mellon Project

BNY Mellon is partnering with NAF on the 'Economic Empowerment of FPOs' project and to promote business and improve their income. The project commenced in April 2018 with an outlay of INR 60 lakhs and a timeline of one year. The project component includes training on various aspects of crop productivity improvement, value chain promotion, fodder development program, enterprise development program, financial assistance for business establishment / business expansion, workshops and market linkages. The details of the four FPOs from three districts of Tamil Nadu is given in the following table.

S.No.	Name of the FPO	Block	District
1	Sholavaram Farmer Producer Company	Sholavaram	Thiruvallur
2	Uthiramerur Farmers Club Federation	Uthiramerur	Kancheepuram
3	Olakkur Farmer Producer Company	Olakkur	Villupuram
4	Raja Desingu Farmer Producer Company	Gingee	Villupuram

The following processes were undertaken to support the FPOs through this project.

- Need Assessment - Meetings were arranged with the Board of Directors of the companies to discuss the need assessment for business establishment and business

expansion including value chain. Project plans were devised based on the outcome of the meetings.

- Training on Lean Farming Technologies for FLD farmers - As part of the project plan, one day training programs on Lean Farming Technologies were conducted to make the FLD farmers aware of scientific farming technologies. The dissemination consisted of both – using power point presentations with relevant photographs for easy understanding and practical knowledge. Under this component, a total of eight such trainings were conducted in the four FPOs.

- Training on Allied Agri Business - As most of the farmers have cattle, training on milch animal and poultry management was imparted to the FPO farmers. Veterinary doctors from the local veterinary hospital were invited as resource persons to train the farmers. The importance of animal health maintenance, precautionary health care, important vaccinations was emphasized to the farmers. Different types of fodders, balanced nutrition to animals, and role of mineral mixture in animal health were also explained. Two programs in each FPOs were conducted for agribusiness improvement.
- Training on Marketing and Branding -Training on marketing and branding was imparted to the FPOs. The importance of branding agricultural produces and different

methodologies in marketing were explained to the Directors and members of FPOs. In total eight such programs were conducted for the four FPOs.

- Accessories for preparation of Bio Inputs - Utilization of organic inputs has drastically reduced among the farmers over the years. To promote use of organic inputs, important accessories for preparation of organic inputs like panchakavyam and vermicompost were provided to two beneficiaries from each FPO. Raw materials for preparation of panchakavyam included fibre barrel, ghee etc., while for vermicompost it included construction materials like solid brick / hollow bricks, cement, thatches, vermiworms, etc.

- Fodder Units - Milch animal rearing is the major activity in Uthiramerur FPO, but availability of fodder is not adequate. To meet out the fodder requirement, Model Fodder Units were established for progressive farmers, so that other farmers can also replicate and meet their fodder demands. Ten such fodder units were established.

- Front Line Demonstrations - Of the 190 FLDs spread over the four FPOs area, 79 FLDs have already harvested while in the remaining 111 FLDs, harvesting is ongoing and is expected to be completed by March end. Following table depicts the status of the FLDs under each FPOs.

S. No.	**Name of the FPO**	**Total FLDs**
1	Raja Desingu FPO	50
2	Olakkur FPO	50
3	Sholavaram FPO	50
4	Uthiramerur FPO	50
	Total	**200**

NAF field staff are regularly monitoring the FLD farmers to ensure timely application of inputs, irrigation during critical crop growth stages, weeding and pest management. In addition, NAF experts also periodically visit the FLDs and provide field advisory services. Farmers are encouraged to use bio and organic pesticides instead of using pesticides while pests are within the Economic Threshold Level. Farmers are also advised on precautionary measures to be taken to harvest quality produces. The details of the harvest from the FLDs is shown in the following table.

FPO	Crop	Yield/Acre		Profit/Acre		% increase in Yield	% increase in profit
		Demo	Control	Demo	Control		
Gingee	G'nut	1012	792	34542	18962	27.69	82.15
	Lablab	3750	3375	43466	31800	11.11	36.68
	Black Gram	712	589	18403	10149	21.02	81.33
	Chilly	7716	6583	114400	63291	17.21	80.75
Olakkur	Paddy	2050	1600	14436	5193	28.71	180.83
	Gourds	7123	6106	61545	35438	15.94	84.80
UTR	Paddy	1830	1485	9170	5035	23.86	82.80
Sholav Aram	Bhendi	17000	14131	223283	146420	20.30	52.49
	Paddy	2045	1540	23131	12333	32.73	87.55

4) Sustainable Watershed and Natural Resource Management as Climate Change Adaptation Strategy in Tamil Nadu - Pershing India

Climate change has affected the agriculture sector immensely, the most vulnerable being the small and marginal farmers who are rainfed. Watershed and Natural Resource Management is seen as a climate change adaptation strategy to overcome the climatic variabilities that create havoc with farm productivity leading to precarious livelihood of such farmers and ultimately impacting the domestic and national food security. Judicious soil and water management with other support systems like INM, IPM, quality seeds, better implements etc., can pave way for sustainable agriculture.

In this regard, Pershing India supported the efforts towards dissemination of climate resilient technologies to lead farmers of Marakkanam and Thellar through the Farmers Producer Organisations. In addition, the following tree seedlings were also distributed to the beneficiaries, as in the following table.

S.No	Particulars	No. of plants		Total No. of Plants
		Marakkanam FPO	Thellaru FPO	
1	Mango	270	150	420
2	Sapota	130	150	280
3	Guava	100	150	250
4	Tree seedlings	-	50	50
	Total	**500**	**500**	**1000**

5) Waterbodies Rejuvenation Program - KLA Tencor

The Waterbodies Rejuvenation Program, sponsored by KLA Tencor is being implemented in Murukkery and Aandithangal villages of Uthiramerur block. One of the component under agriculture is to afforest the project area, as this can support in carbon sequestration. In the project areas, Instead of timber or forest species, efforts was made to give fruit saplings, as they produce more biomass and over be more beneficial to the community by meeting their

nutritional supplement. Accordingly, 300 fruit seedlings have been distributed to the community as per the following details:

S.No	Plants	No. of plants
1	Mango	150
2	Sapota	50
3	Guava	100
	Total	**300**

6) NAF as Knowledge and M&E Partner for HCLF

NAF has signed a MoU with HCL Foundation (HCLF) to function as knowledge partner for HCLF Project Samudhay initiatives in Uttar Pradesh. Under this assignment, NAF will assist and support HCLF in Monitoring & Evaluation (M&E) studies of HCLF initiatives on agriculture as well as promotion of Farmer Producer Organizations in Hardoi district of UP. M & E studies have been completed and the advisory service on FPO formation is under progress.

7) NAF – CLRI Collaborative Adaptive Research Project

Studies on Characterization of Fur Compost and its Efficacy on Rice Crop

The Central Leather Research Institute (CLRI) has collaborated with NAF to conduct adaptive research on utilizing animal hair compost as effective organic manure. CLRI has developed a bacterial strain that can digest animal hair which is a by-product of tannery industry. Field investigations were carried out by NAF in three locations viz: Acharapakkam, Marakanam and Chitamur blocks in Tamil Nadu to study the characterization of fur compost and its efficacy on rice crop. The project outlay is INR 5 lakhs on a 50:50 cost sharing between CLRI and NAF.

Test trials using the rice variety ADT 37 were conducted in randomized block design with four treatments and three replications during January-2017 to May 2017 and the confirmatory trial during December 2017, March 2018. The four treatments comprised of T0 -RDF+control, T1-RDF+500 kg/ac fur compost, T2-RDF+750 kg/ac fur compost, T3-RDF+1000 kg/ac fur compost. Among the treatments, application of T2-RDF+750 kg/ac fur compost recorded higher yield attributes and grain yield of rice during both seasons, respectively. (RDF – Recommended Dose of Fertilizers)

In continuation to this first phase, CLRI and NAF have signed an agreement for carrying out adaptive research and multi-location trials on liquid formulations of organic supplements prepared from fur compost. The project will commence on the arrival of liquid formulations for field application. The initial characterization has already been done and has been found fit for use for field application.

Agri-business Development Division

Indian economy is globally identified as an agrarian economy. Agriculture is called the backbone of our economy as it supports the livelihood of more than 50% of the nation's population. But the farmers, especially the small land holding farmers, struggle to meet ends on a day-to-day basis due to various issues at both the national and local level. Ironically though, farming is deemed to be economically profitable, but being a farmer is not.

Of late, there has been considerable shift in agriculture from "Subsistence farming" to "Market Led" approach. i.e. "Agri – Culture" to Agri – Business". Thus, collectivization and resource pooling has been the norm for sustainable agribusiness options. Farmers Producer Organizations (FPOs) have been identified as engines of change in agribusiness. In order to address the challenges faced by the farmers in making agriculture a profitable business, FPOs are being promoted with handholding support from the Government. FPOs are agribusiness companies (registered under Companies Act 2013) promoted by farmers and primary producers as shareholders. This helps in collectivization of their inputs and resources thereby enabling them to access technology, inputs, credit as well as market thereby realizing the economic benefits from agriculture.

Realising the potential of the FPOs in reconstructing the rural economy, NAF has formed a separate functional division called Agri-business Development Division. The core purpose of this division is to focus on formation, nurturing and strengthening of the FPOs as a profitable and sustainable business model through the application of scientific management principles such as branding, marketing, setting up a supply chain, operations management, financial management, value addition, processing, market linkage, digitization etc.

NAF is increasingly focusing on equipping the FPOs and considers these collectives as a strategic tool to achieve the government's vision of doubling the farmers' income by 2022 that deal with farming as a profit-making venture with responsibility to the natural resources and the consumers.

Broadly promotion of agribusiness and FPOs are done by - building rural entrepreneurship; linking SMF to integrated agri value chains; promoting agri enterprises and facilitating forward and backward linkages through credit linkages, produce aggregation, value addition and marketing linkage/tie ups.

Progress of the existing FPOs

As part of agribusiness activities, NAF has been promoting Farmers Producer Organizations (FPOs) with support from the Small Farmer Agribusiness Consortium (SFAC), GoI / GoTN and NABARD. Four FPOs were promoted with support from SFAC in the first phase in April 2015. The project was successfully completed by July 2018 for three FPOs and the remaining FPO was completed by March 2019.

Of the four FPOs promoted in the first phase, all have progressed and ventured into business activities as mentioned in the following table,

Name of the FPO	Details of Operation			Remarks
	Input supply center	Farm machinery center	Food Processin g center	
Thangathamarai	Yes	Yes	Yes	Dhall mill commenced its commercial operations from October 2018
EriyurManimutha	Yes	No	Yes	Cold pressed oil unit has been established and has commenced the commercial operations since November 2018
Rajadesingh	Yes	No	Yes	Dhall mill has commenced its commercial operations from July 2018
Valwill Sudesi	Yes	No	Yes	Millet based products are being prepared and commercial operations have commenced from May 2018

The major essence of the support by SFAC to NAF was towards the handholding of the FPOs in order to make them independent to market their produce, scale up their activities and be sustainable in the long run. NAF mentored these FPOs through trainings, linkages, mentoring with all activities envisaged towards the goal of strengthening the FPOs completed by July 2018.

New FPOs

TNSFAC has sanctioned facilitation and mentoring of an additional six FPOs for NAF, wherein similar activities of formation, nurturing, strengthening, value addition and handholding are carried out in six districts. The location of the six FPOs and the major commodity that they deal with is shown in the following table.

S No	Name of the district	Crop/Produce/Commodity
1	Kancheepuram	Groundnut
2	Thiruvallur	Pulses
3	Salem	Millets / flowers
4	Vellore	Pulses / vegetables
5	Krishnagiri	Pulses / flowers
6	Udhagamandalam	Tea

Of the six FPOs, five have been registered as company under the Company Act. The current status of the FPOs is shown in the following table.

District	Name of the FPO	Number of farmers enrolled	Number of villages covered	Amount of share capital collected
Krishnagiri	RESAHE	1000	12	5.8 lakhs
Thiruvallur	PONNERI	1000	17	10 lakhs
Salem	JARUGAMALAI	975	8	10 Lakhs
Nilgiris	HIGH HILLS	1000	30	7 Lakhs
Kanchipuram	UTHIRAMERUR	800	40	10 lakhs
Vellore	ALANGAYAM	460	12	7 lakhs

The FPO functionaries have been taken on exposure visits and field studies to successful FPOs which have been promoted by NAF to enhance their understanding of the functions and operations of FPOs and its office bearers in order to utilize the knowledge gained to take forward to their respective FPOs.

Apart from this, the FPO functionaries have also been taken on an exposure visit to AgriIntex Fair in Coimbatore and Vibrant Tamil Nadu Expo in Madurai which is one of the largest Agriculture Fair in India to get a deeper knowledge.

Name of the FPO	Number of exposure visits
Uthiramerur	2
Ponneri	3
Resahe	3
Alangayam	3
Jarugamalai	3
High Hills	-

Collective Farming FPOs

The Government of Tamil Nadu launched a project on collective farming, wherein group of farmers were supported with subsidy for procurement of farm machinery and farm machinery center as a business unit.

Under collective farming, each group has 100 members and ten such groups have been federated to form a FPO. Based on the performance of NAF in formation, nurturing, strengthening and handholding of FPOs allotted in the past, TNSFAC has allotted eighteen FPOs in 1st Phase, sanctioned on 29/11/2018 followed by five FPOs in the second phase on 25/01/2019.

Under the project, NAF will provide the entire capacity building exercise for the economic empowerment of the Farmers Producer Organization farmers to identify areas of business, preparation of business plan, and establishment of value addition unit, packing, branding and marketing of the products. In addition, NAF will also extend handholding support in terms of increasing the membership base and availing of equity grant assistance. The details of the collective FPOs is shown in the following table.

Name of the FPO/Particulars	District	No. of village	No. of FIG formed	Total No. of share holders	No. of BoDs	Share money collection
Pallava CF-FPCL	Kanchipuram	50	50	1000	10	1000000
Uttarakanchi CF-FPCL	Kanchipuram	13	50	1000	10	1000000
Sri Ramanujar CF-FPCL	Kanchipuram	0	50	1000	10	1000000
Thurinjapuram CF-FPCL	Thiruvannamalai	12	45	900	9	900000

Sri Yoga Narasimmar CF-FPCL	Vellore	22	50	1000	10	320000
Arcot Collective CF-FPCL	Vellore	10	45	900	9	900000
Chetpet CF-FPCL	Thiruvannamalai	16	50	1000	10	900000
Anakkavur CF-FPCL	Thiruvannamalai	9	45	900	9	900000
Yellagiri CF-FPCL	Vellore	26	50	1000	10	240000
ThillaiNatarajar CF-FPCL	Cuddalore	9	45	900	10	900000
Marutham Collective CF-FPCL	Villupuram	9	50	1000	10	640000
Virudhagireeswar ar CF-FPCL	Cuddalore	9	45	900	10	900000
Kelamangalam vegetable CF-FPCL	Krishnagiri	10	43	860	11	8,60,000
Sankarapuram CF-FPCL	Villupuram	10	50	1000	10	100000
Keerapalayam CF-FPCL	Cuddalore	9	45	900	10	980000
ELAM THENDRAL CF-FPCL	Salem	35	50	1000	10	750000
NEELAGIRI CF-FPCL	The Nilgiris	29	50	1000	10	1000000
Kolli hills CF-FPCL	Namakkal	10	0	0	0	-
Kosasthalai CF-FPCL	Thiruvallur	10	50	1000	10	987800
Thiruthani CF-FPCL	Thiruvallur	12	49	900	10	900000
Vanmughil CF-FPCL	Tiruvallur	9	50	1000	10	1000000
Rathinasabhai CF-FPCL	Tiruvallur	20	50	1000	10	1000000
Melmalainur CF-FPCL	Villupuram	10	50	1000	11	1000000

NABARD FPOs

Similarly, NAF has promoted FPOs with support from NABARD. In this regard, ten FPOs have been promoted, of which nine FPOs are in advanced stages of functioning. The status of these FPOs is shown in the following table.

Name of the FPO	Total No. of training conducted	Total No. of exposure visits	Business plan	
			Business activity	Turnover
Madurantakam & Acharapakkam	5	2	Input centre	Nil
Lathur & Chithamur	5	2	Input center, Oil expeller unit	7.5 lakhs
Marakanam Watermelon	5	2	Input centre and cattle feed	6.5 lakhs
Olakkur	5	2	Vegetables grading and collection, Input centre, grocery shop.	5.5 lakhs
Thellaru	5	2	Input center	4 lakhs
Gummidipoondi Goodluck	5	2	Input centre and cattle feed	2 lakhs
Puratchideepam	5	2	Input center	
Sholavaram	5	2	Vegetable grading and collection and marketing, input centre	48 lakhs
Veera Rajendrachozhan	5	2	Milk collection center, Mushroom	1.2 lakhs

These FPO functionaries have also been taken on exposure visit to various successful FPOs promoted by NAF. Apart from this, the FPO functionaries have also been taken to the AgriIntex Fair in Coimbatore which is one of the largest Agriculture Fair in India. The functionaries also visited IIFPT (Indian Institute of Food Processing Technologies) located at Thanjavur to understand various food processing techniques and machineries and the different schemes of GoI available to start their own business. They also visited a Banana Farmer Producer Company located at Trichy and the Raja Raja Cholan FPO which works with a mini Dhall mill to understand the operations.

The support extended to NAF by NABARD for handholding these FPOs for their incorporation has been successfully completed and ensured that these FPOs can now market their agricultural produce independently and sustainably and scale up the activities for further for their development.

Equity Grant Sanction from State SFAC and Central SFAC

a) FPOs promoted with support from SFAC

The Government of India / Government of Tamil Nadu are extending assistance in the form of equity grant up to 10 lakhs for mature FPOs. Accordingly, TNSFAC has sanctioned Rs.5

lakhs each to Valwill sudesi FPO in Namakkal district. TNSFAC has also sanctioned Rs.5 lakhs to Eriyur Manimutha FPO in Villupuram district on 5th December, 2019 for performing well during May – June 2018. Three FPOs have already availed the equity grant assistance last year.

In addition, Valwill sudesi FPO and Eriyur Manimutha FPO has applied for equity grant from Central SFAC. Valwill FPO has got the sanction of Rs. 5.00 Lakhs from Central SFAC in New Delhi on 25.07.2018.The equity grant assistance would be used by the FPO for its business expansion.

b) FPOs promoted with support from NABARD

Of the ten FPOs, nine FPOs are eligible for application to equity grant assistance. Of the nine eligible FPOs, four FPOs have received equity grant assistance from SFAC. SFAC is processing the application for equity grant for the remaining five FPOs of which field verification has been completed for four FPOs with legal processing under way, while the remaining FPO is in the field verification stage.

S.No	Name of the FPO	Amount sanctioned INR (in lakhs)	Status
1.	Sholavaram	10	Received
2.	Thellaru	5	Received
3.	Lathur and chithamur	5	Received
4.	Olakkur	5	Received
5	Marakkanam	5	Yet to receive
6	Madurantakam & Acharapakkam	5	Yet to receive
7	Gummidiponndi Goodluck	5	Yet to receive
8	Veerarajendrachozhan	5	Verification Done
9	Puratchideepam	5	Verification Stage

Commencement of Dhall Mill for existing SFAC FPO

Raja Desingh FPO has successfully started a Dhall mill on 15th June 2018. The District Collector of Villupuram, in the presence of our Trustee Mr M.R. Sivaraman, IAS (Rtd) inaugurated the mill. The operations of the mill are stabilizing and the FPO has processed over ten tonnes of pulses so far which have been marketed at good price.

Raja desingh FPO has processed 50 Tonnes of Dhall so far with a turnover of 35 Lakh. Under the Mission on Sustainable Dryland Agriculture (MSDA) Scheme, Rs. 10, 00,000/- had been

sanctioned Colour based dhall Sorter machines. The segregation of Dhall based on quality can fetch higher market returns. The produce is now branded and marketed by the producer companies in bulk and retail orders.

Thangathamarai FPO has successfully started its Dhall mill operations on 21.09.2018. The mill has processed 200 Tonnes of Dhall with a turn over of about rupees one crore so far. The operations of the mill are stabilizing and the products are marketed at good price.

NAF is also arranging for bulk orders of other pulses like moong, urad and arhar dhal for Raja Desingh and Thangathamarai FPOs from reputed market players. NAF has arranged toor dhall from Madhya Pradesh through Way Cool Pvt Ltd for service based processing of raw material at a cost of Rs.50 Lakhs.

a) Credit Linkage

NAF has also facilitated credit linkage for FPOs as shown in the following table. We have facilitated for loan from various nationalized banks in Tamil Nadu. NAF has guided the FPOs to apply for loans for value addition / processing unit with various banks.

S.No	Name of the FPO	Name of the Financial institution	Amount sanctioned INR (in Lakhs)	Status
1	Lathur and Chithamur	Indian Bank	15	Received
2	Thellaru	NABKISAN	17.87	Received
3	Sholavaram	Indian Bank	40	Received

The Lathur and Chithamur and Thellaru FPOs have commenced Cold Pressed Oil mills and Sholavaram FPO has commenced vegetable marketing and input supply center, with the help of the bank loans.

b) Market Linkage Arrangement

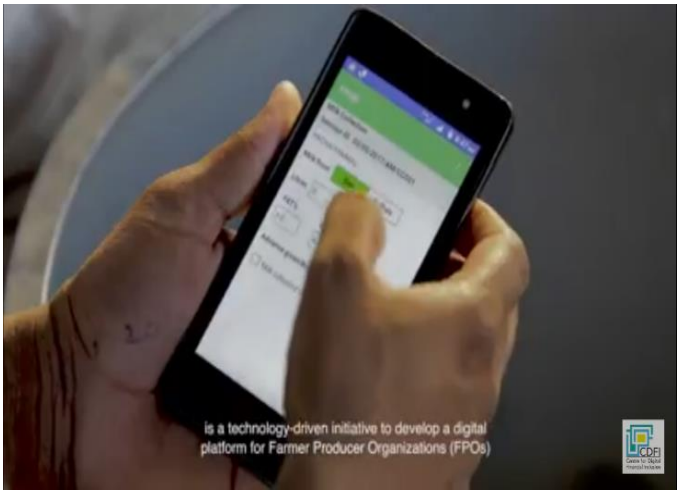
NAF has also arranged for market tie-up agreement with the following retail companies who have agreed to procure produce / commodity from FPOs promoted by NAF.

Way Cool Fresh Ltd.

Way Cool Fresh Ltd. is a retail company which is working on B2B and B2C models of vegetables and fruits supply as well as food grains and other agro commodities. Sholavaram FPO, promoted by NAF under NABARD assistance has already been linked with this company, with the FPO supplying vegetables and greens worth Rs.15, 000/- to 20, 000/- on a daily basis. This is expected to expand to other vegetable-based FPOs shortly. Thangathamarai FPO has processed 140 tonnes and Raja Desingh FPO 15 tonnes of dhall to Way Cool. Sholavaram FPO has also supplied green gram worth Rs. 30 lakhs while Gummidipoondi Good luck FPO has supplied groundnut worth Rs. 8 lakhs to Way Cool Fresh Ltd.

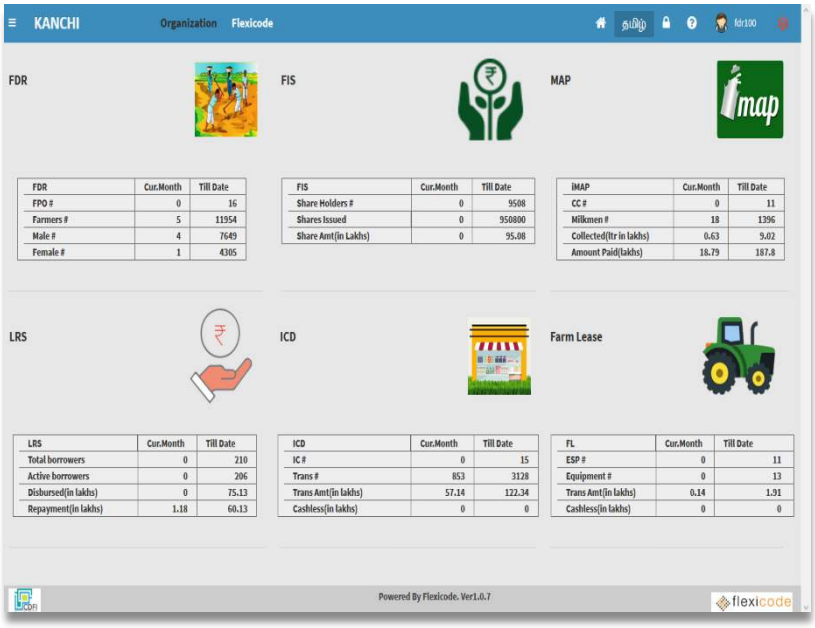
c) Digitizing the Business Operations of FPOs - KANCHI

NAF in collaboration with the Center for Digital Financial Inclusion (CDFI) is implementing a project KANCHI (Kisan Advancement through CasHless Innovation). Under this, several modules are being worked upon like the Farmer Data Repository (FDR), Farmer Investor Services (FIS), Milk Aggregation Portal (MAP) and Lending and Recovery System (LRS), Input Center Digitisation (ICD), Farm Lease, PA & WHS, were developed.



i. MAP Enhancement

In addition, MAP has been upgraded to suit the requirement of milk aggregators of AAVIN, wherein automatic milk analyser and weighing machines are used. The enhanced system will capture data directly from the milk analyser and facilitates aggregators to generate payment advice.



FDR	Cur.Month	Till Date
FPO #	0	16
Farmers #	5	11954
Male #	4	7649
Female #	1	4305

FIS	Cur.Month	Till Date
Share Holders #	0	9508
Shares Issued	0	950800
Share Amt(in Lakhs)	0	95.08

iMAP	Cur.Month	Till Date
CC #	0	11
Milkmen #	18	1396
Collected(ltr in lakhs)	0.63	9.02
Amount Paid(lakhs)	18.79	187.8

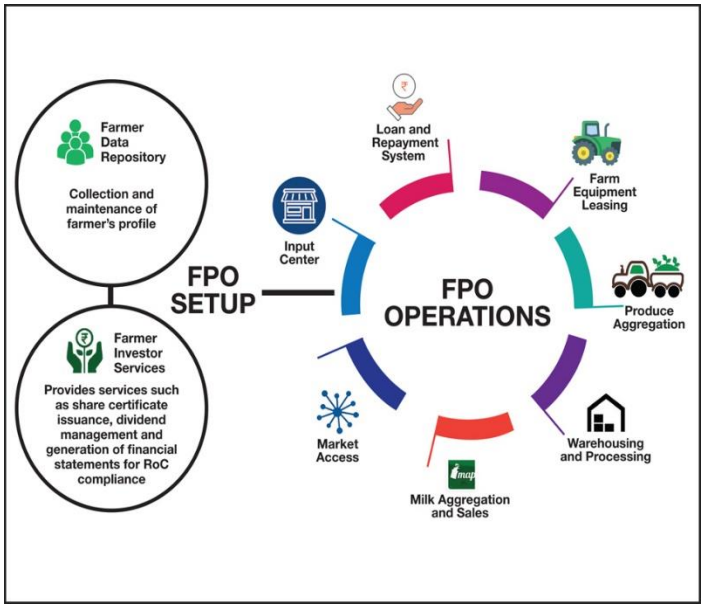
LRS	Cur.Month	Till Date
Total borrowers	0	210
Active borrowers	0	206
Disbursed(in lakhs)	0	75.13
Repayment(in lakhs)	1.18	60.13

ICD	Cur.Month	Till Date
IC #	0	15
Trans #	853	3128
Trans Amt(in lakhs)	57.14	122.34
Cashless(in lakhs)	0	0

FL	Cur.Month	Till Date
ESP #	0	11
Equipment #	0	13
Trans Amt(in lakhs)	0.14	1.91
Cashless(in lakhs)	0	0

ii. Input Center Digitization (ICD)

In order to capture the business operations of input centers run by FPOs, ICD module has been devised and has been rolled out. This creates a stock management and invoicing system. This will also facilitate cashless payment system through integrated machine liked with Apna Pay. We have transacted an amount of 1.22 Crore using Apna Pay in the first year.



iii. Farm Lease Module

Similar to ola and uber taxi services which are successful as aggregator models, KANCHI has developed an additional module, namely the ` Farm Lease' wherein the farmers' requirement of farm machineries like tractors and implements, harvesters etc., can be booked through mobile with payment made possible through mobile banking. This is in the pilot stage of field testing.

iv. Produce Aggregation (PA), Warehousing system (WHS), e-Commerce (KANCHI KART) and Revenue and Expenses Management (REM) modules

In order to facilitate digital transactions of FPOs, additional modules such as Produce Aggregation, Warehouse Management system, on line marketing portal as well as revenue and expenses management system of FPOs are being developed. These modules will help track the businesses as well as smoothen the business processes besides facilitating compliances for FPOs in the long run. All these modules are in the development stage wherein ERD (Entity-Relationship Diagram) has been completed and prototypes are being generated along with user stories.

Training and Capacity Building Division

NAF believes that the training and capacity building activities before the start of the project and throughout the length of the project is the most important factor for the pivotal success in other divisions.

This division serves to bring behavioural transformation and to ensure human resource development across rural India through demand-driven education and training model. The prime objective is not only to increases the ability of farming community to innovate and adopt new technologies in agriculture but also to ensure continuous improvement in economic, environmental and social performance of the rural community. Training is imparted on "technology-oriented" and "participant-oriented" modes to various stakeholders of agriculture and rural development including farmers, youth, agripreneurs, women, socially excluded, functionaries of NGOs, water users, producer groups, input suppliers, bankers and students among others.

Some of the key considerations of this division includes the fact that our beneficiaries' access to formal education is limited, so, we factor-in this limitation while designing the training modules. Livelihoods oriented trainings are focussed upon to increase human capabilities. Rural Livelihoods are diversified and hence, special training on non- farm activities are given. To educate financial ethics among the people, financial literacy trainings are included. Specific difficulties like gender-related issues are considered and special focus for women farmers and other women beneficiaries are given.

Training for the farmer's organizations focuses on governance of these institutions, achieving financial stability and environmental sustainability. Additionally, marketing skills, business strategy, scale-up strategy, and business plan are also imparted to the farmers.

Climate change related problems threaten agriculture sector profoundly. Special training on climate-smart agriculture, lean farming, sustainable agriculture, and adaptive management techniques etc., are provided to increase the resilience of the farmers to climate change related impacts. Water being scarce commodity, training on water saving technologies are also imparted.

Mixed methodology of classroom-based and field training is adopted. Innovative teaching methods are adopted to overcome learning difficulties of the beneficiaries. We promote and facilitate lateral learning (Farmers-Farmers learning).

NAF - Center for Rural Development is dedicated to train and build the capacity of the farmers on technology based agriculture to transform the Indian agriculture from "production-oriented" mode to a holistic one which is also "market-oriented. This can be achieved by developing an integrated and innovative rural development model that equip farmers with technology, which in turn helps them increase the productivity per unit area.

In this context, a total of 2873 people/farmers visited our CFRD Training Centre for various trainings, meetings and corporate volunteerism. Amongst the 2873 who visited, 1869 farmers were given training on various aspects of sustainable agriculture through 31 training programs for the period of 2018-19.

ACABC Training Program

The Agri Clinic and Agri Business Center (ACABC) is a Government of India (Ministry of Agriculture and Farmers Welfare) initiative which is a unique program to tap the expertise of available agricultural graduates, agriculture diploma holders, veterinarians etc., to offer professional extension service to farmers, thus enhancing the agricultural development of the country.

Eighty-two Nodal Training Institutes (NTI) have been identified throughout the country towards this purpose of utilizing the available expertise. NAF is one of the leading NTIs in Tamil Nadu and towards this, NAF provides entrepreneurial skill to agricultural graduates and mentoring them to perform as a reliable extension provider for rural agriculture.

Thus far, NAF has conducted two ACABC training program for 70 agripreneurs for this financial year of 2018-19. Of the seventy people trained by NAF, twelve have started businesses with their own investment successfully after completing the training.

NABARD WDF - Climate Proofing Project Training

As part of the Climate Proofing Project, capacity building training was conducted for the beneficiaries under four watersheds viz: Arasur, Nugumbal, Othivilagam and Sirukalathur in Tamil Nadu. The training was designed to be conducted in two phases. The following topics were tackled under the trainings conducted in the first phase at NAF - Center for Rural Development, Illedu.

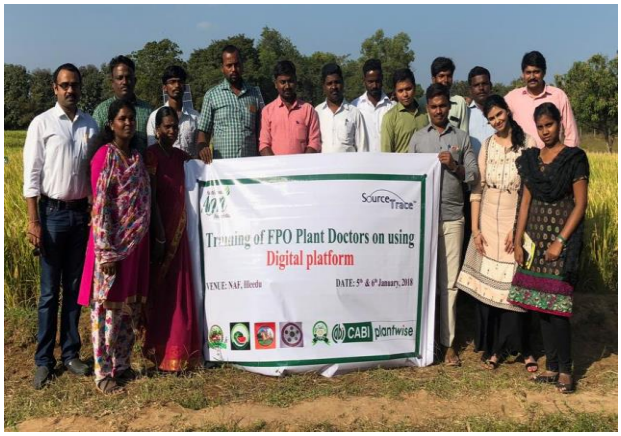
- Vermicomposting
- Organic fertilizers preparation
- Soil testing for Organic carbon
- Animal health

- Crop diversification
- Inter cropping
- Companion cropping
- Flower production

All trainings were conducted for beneficiaries of the four watersheds. A total of 508 farmers benefited through this initial capacity building training program.

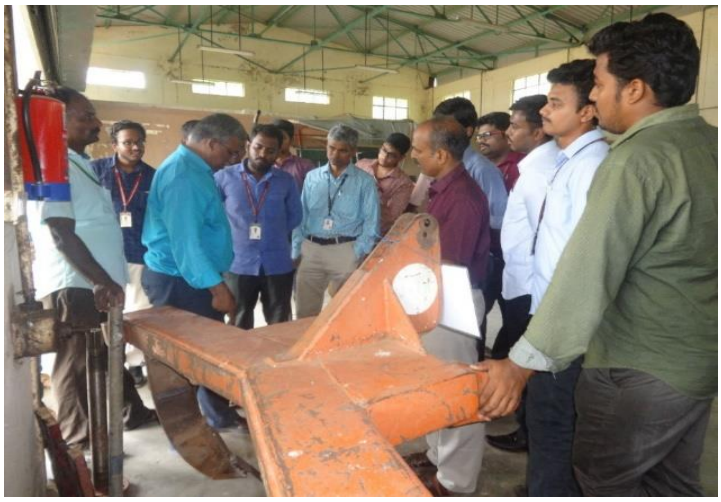
NAF - CABI Training on Geo Tagging

CABI (Centre for Agriculture and Biosciences International) is an international not-for-profit organization that improves people's lives worldwide by providing information and applying scientific expertise to solve problems in agriculture and the environment. CABI has already partnered with NAF to provide expertise service to farmers through its `Plantwise' program and Plant Clinic Program in ten locations. As a continuation of this project, training on geo tagging was given to fifteen team members of NAF.



Venkateswara Engineering College – Orientation and Exposure Training on Farm Machineries

To orient the students on availability of farmer friendly low-cost machineries that would enable them to understand the specific needs of farmers which will guide them to design new machineries, NAF arranged an Orientation cum Exposure Training on Farm Machineries for 23 students of the Venkateswara Engineering College.



RAWE Programme

To provide opportunities to the students for studying rural situations and to make them understand the concept and spirit behind NGOs, six students from the Don Bosco Agricultural College visited NAF. They were given insights about the functioning of NGOs, their role in rural developmental activities, SHG, watershed activities etc. as a part of Rural Agricultural Work Experience Program (RAWE).

Interface Meet – Farmer Producer Organisation: SFAC – NAF – NABARD

NAF initiated interface meeting of 43 FPOs promoted by NAF with the support of SFAC – NABARD to discuss ways to take forward the Farmer Producer Organisations in Tamil Nadu. 77 stake holders from the 43 FPOs participated during which four technical sessions were held for the benefit of farmers.

NAF - ATMA

Under ATMA (Agricultural Technology Management Agency) scheme, NAF conducted two training programs on Organic Agriculture and Promotion of Minor Millets which was attended by seventy farmers.

TATA Capital – Vandavasi Watershed - Training and Exposure Visit

As part of the project with TATA Capital for implementing "JAL AADHAR"/Water Conservation for Sustainable Livelihood", to create awareness on watershed initiatives, ninety five farmers were trained and taken to Nugumbal watershed to understand the importance of water conservation and its benefits.

Laser Land Leveller – Water Saving Technology: A New Arrival for Farm Machinery Center

Laser land leveler, a long felt need of the farmer that helps in water conservation and reduces irrigation water by 30%, was added to the farm machinery center of CFRD.

Polyhouse – A High End Technology to Grow Off Season Crops

Polyhouse cultivation allows for growing of crops under controlled condition such as temperature, humidity, fertilisers with help of automated condition. CFRD has installed a polyhouse of 1000 sq. mt to grow European cucumber and lettuce. It is divided into three parts - 500 sq.m of soil cultivation, 250 sq.m of grow bag cultivation and another 250 sq.m of soil medium for research and demo crops.

CFRD Farm Activities

On the two-acre CFRD farm, it is a regular practice to take up different crop patterns to demonstrate to farmers the need for alternate cropping system and crop rotation for healthy production. We cultivated crops like *ragi*, *cholam*, *cumbu*, maize and black gram in summer months of May to July 2018. To conserve soil moisture, we demonstrated plastic mulching technology with brinjal crop to the farmers. We also tried Hydroponic model (soilless cultivation) to demonstrate to farmers, to grow fodder crops in plastic trays during lean summer season when green fodder under open field condition is not possible due to water scarcity. This model is suitable for landless rural family whose livelihood depends on animal husbandry. The initial results are encouraging and further trials need to be conducted.

Farm upgradation in CFRD has been undertaken through establishment of models such as poly house, solar motor, drip Irrigation system, azolla unit, vermicompost unit, biogas unit, shade net nursery, hardening units etc.

NAF – MKSP

MKSP – Mahila Kisan Sashaktikaran Pariyojana, a Government of India program is also implemented by the TNCDW of the Government of Tamil Nadu. As a pilot project, three districts viz., Kanchipuram, Thiruvallur and Villupuram were identified for launch of MKSP which aims at improving the livelihood of women engaged in agriculture by imparting intensive training on sustainable agriculture. In Thiruvallur and Kanchipuram districts, NAF has been identified as a Technology Transfer partner for facilitating capacity building to Community Resource Persons (CRPs) and *mahila kisans*.

A total of 16800 beneficiaries were identified in the three districts of which 8000 beneficiaries were trained by NAF.The project is ongoing successfully in Thiruvallur and Kanchipuram districts. Till now, 2000 *mahila kisans* have been trained in Thiruporur covering 11000 training heads, each covering training in 11 modules. In Gumidipoondi block, 7836 training heads have been completed. In Sholavaram, 1000 *mahilas kisans* have undergone training in 6 modules.

Baseline Study on Horticulture Value Chain for CABI

NAF was selected by CABI (Centre for Agriculture and Bioscience International), an international intergovernmental agency for conducting baseline study on horticulture value chain in Tamil Nadu with FPO as the basis. NAF conducted the study and submitted its report to CABI in March 2019.

Social Development Division

NAF supports various social development activities for diverse reasons. Many a times, social development activities are carried out as an Entry Point Activity for other large-scale developmental interventions. NAF also acts as a CSR project implementer for our corporate clients to support them in materialising their CSR vision. NAF's Social Development Division is associated with activities related to community development, sanitation & hygiene, education, awareness and various other comprehensive dimensions of rural development. NAF has promoted Self-Help Groups (SHGs), Panchayat Level Federations (PLFs) and providing constant follow up services to encourage women enterprises. NAF has developed a huge corpus among SHGs through Revolving Fund.

Apart from the major thrust areas of agriculture and watershed development in the country, NAF, as an experienced development organisation has been working on special issues through contribution from the corporates. This work could be one off kind either during emergency situations like floods and earthquakes and rebuilding thereafter or for social causes to build up infrastructure or capacity building of schools and community. In this context, NAF has worked on natural calamities that struck the country during this reporting period, for instance the massive flood of Kerala and the Gaja cyclone that hit the east coast and caused extensive damage in Tamil Nadu. Similarly, NAF has also focused on schools a part of its social initiatives partnering with the corporates to support educational and social needs. The highlights of the work are detailed in the following section.

Kerala Flood Relief

Severe floods affected Kerala in July and August months, due to the unusually high rainfall during the monsoon season and considered to be the worst flood in the state in the last one century. According to the Kerala government, one-sixth of the total population (more than 3.5 crores) of the state were directly affected by the floods and flood related incidents. The Indian government had declared the 2018 Kerala floods as a Level 3 Calamity ('calamity of a severe nature'). To help the flood affected people of Kerala, NAF coordinated the flood relief mission.

A) Flood Relief work supported by BNY Mellon Technology Pvt. Ltd.

As an immediate relief measure, BNY Mellon provided relief material packages to severely affected regions and also areas that had not received requisite attention. The relief measures targeted the neediest people and villages which were not reached adequately by other relief providers. Along with tangible supports, BNY Mellon also provided moral support to the affected communities.

The relief materials to different areas were provided in four phases (on 24th Aug, 28th Aug, 3rd Sept and 9th Sept 2018). In first phase, major focus was given to providing food packages and sanitary and hygiene products. Relief items included food materials like rice, pulses, atta, masala powders, rava, noodles, water bottles; sanitary/ cleaning items such

as washing powder, bleaching powder, dettol, gloves, masks; toiletries like soap, baby soap, tooth brush, tooth paste, hand wash; and other items like baby diapers, sanitary pads etc.

During distribution of relief materials in the first phase, crucial requirements of the affected people were collected to plan the flood relief mission in the second phase. During the second phase, food packages, sanitation and hygiene products, household utility items, undergarments, sleeping mats, etc., were provided as per the need. In the third phase, the contributions from BNY Mellon Pune office was collected and transported to the Wayanad Relief camp, Kerala. In the last phase, school children who lost their books and uniforms were provided with uniform, text books, notebooks and stationary items. Around sixty volunteers from BNY Mellon were involved in segregating, packing and sending the relief materials. Along with NAF Team, some of the BNY Mellon volunteers also travelled to Kerala and worked for flood relief by distributing the relief materials. The details of flood relief by BNY Mellon is provided in the following table.

Place	**Relief Details**
Chengannur region (Puthencavu, Puliyoor, Aranmula, Kozhenchery), Alappuzha district	Relief materials given to 950 families, Food was provided twice to 450 inmates of three orphanages and once to around 200 people in the locality
Wayanad district	Provided bulk relief package to Wayanad Relief Camp
Chendamangalam region, Ernakulam district	Relief materials given to 150 families
Thiruvalla region (Perengara colony, Thanankadu colony and Karaikkal), Pathanamthitta district	Relief materials given to 460 families
Kalamassery, Ernakulam district	School uniform, text books, notebooks and stationary items given to 170 students

B) Flood Relief work supported by Pershing India Operational Services Pvt. Ltd.

Another BNY Mellon Group Company, Pershing India Operational Services also came forward to support NAF for the relief work for Kerala floods.

Relief kits consisting of the items (rice, utensils, clothes-towel, garments for men and women, bed sheets, plastic buckets and plastic mat) were distributed to about 460 families during September 2018, through the support from Pershing India. More than 150 families were provided select items like utensils, cloths, bucket and other relief materials. NAF ensured that these relief materials reach the needy peoples in the areas which were not

covered by other relief providers. The places included Naduvilaebhagam, Tannunngad, Vettiakonam, Karaikkal, Perengara and Mepral in Thiruvalla district.

Cyclone Gaja Relief

Gaja cyclone of November 2018 affected Tamil Nadu and left a trail of destruction in about ten districts destroying houses, fields and infrastructures and uprooting many trees. Though the impact of the severe Gaja Cyclone is not well documented at field level, but based on the available data, it is estimated that 65 people lost their lives and more than 87,000 houses were destroyed, making over 3.4 lakhs people homeless. Around one-crore coconut trees were damaged and more than 30,000 ha of agriculture and horticulture land were affected due to the cyclone.

The impact of Gaja cyclone has been immense as it completely devastated the livelihoods of the affected communities including the fishers and farmers. Coconut farming is the major livelihood in the farming communities of the locality. But as a result of the cyclone, coconut farmers have become poor overnight as their coconut farms faced the onslaught of nature's fury with lakhs of coconut trees uprooted, destroying their livelihood and with no alternate sources of income, they face a bleak and uncertain future.

Small farmers who do not have perennial water sources and who cultivate paddy during monsoon seasons and coconut for regular earning also lost their livelihood opportunities. They do not have adequate resources to make a living in the immediate scenario. Landless people who depend on the landlords and coconut groves for their livelihoods, also face difficulties as they cannot be paid by the large famers whose field and groves are destroyed. So, the future of all section of farmers are dismal.

In this scenario, BNY Mellon Technology Pvt. Ltd. came forward and partnered with NAF to help the Gaja cyclone affected communities with immediate relief measures.

A) Relief work under support of BNY Mellon Technology Pvt. Ltd.

NAF, through the support of BNY Mellon Technology Pvt. Ltd focused on the cyclone affected villages of Thanjavur and Nagapattinam districts. As an immediate measure, community kitchens were set up in two places in the local schools at Pattukottai and Amalapattai (near Pattukottai) and food was provided twice a day for one week. As many of the houses lost the thatched roofs, there was huge demand for tarpaulins to provide shelter to the family during rains. The affected community members were also given bed sheets, plastic mats, utensils, drinking water, candles and mosquito coils etc. Chain saw machine was provided to the community to cut and remove the trees from the roads and farms. While distributing relief materials, community members requested solar lanterns as there was no electricity for days together. NAF bought solar lanterns and provided it to the community. Industrial safety helmets were procured and handed them over to the Nagapattinam District Collector for personal safety use by the various government department staff involved in clearing the fallen trees.

For a long term basis, along with the relief efforts for immediate support, NAF also conducted impact study and developed a livelihood rehabilitation plan for the cyclone affected region. NAF intends to use its' expertise in rebuilding the livelihoods of households by taking up rehabilitation interventions for agriculture, animal husbandry, training and capacity development, promotion and strengthening of community groups etc., during 2019-20.

National Digital Literacy Mission

NAF has implemented National Digital Literacy Mission (NDLM) through the support of BNY Mellon Technology Pvt. Ltd. The mission program is implemented under the aegis of NASSCOM Foundation.

NDLM has been initiated with the vision to empower at least one person per household with crucial digital literacy skills by 2020. It is an effort to complement the Government's vision to transform one from each household as digitally literate. The project aims at helping adults with low technological literacy, develop skills needed to interact in an

increasingly digital world. Through the mission, digital literacy awareness, education and capacity programs are carried out to make the rural communities fully participate in the global digital economy.

The program is being implemented at NAF Centre for Rural Development, a dedicated Centre for training and capacity building activities. The new NDLM Centre envisions to improve the digital literacy of members of rural and agrarian community. NDLM Centre was inaugurated on February 21, 2019 in the august presence of top officials from BNY Mellon and NASSCOM Foundation. So far, 40 trainees in two batches have completed the training successfully.

Kazhuperumbakkam Govt. School project under BNY Mellon support

BNY Mellon had adopted a school in Kazhuperumbakkam village of Tindivanam block of Villupuram district, Tamil Nadu to upgrade the school facilities and provided funding support to the project through United Way Worldwide (UWW) and BNY Mellon Technology Private Limited (under CSR support). The project aimed at making the Kazhuperumbakkam Govt. Higher Secondary School (GHSS), a replicable model school for the nearby rural regions, by equipping the school with smart classrooms; proper sanitation & hygiene facilities and renovating the school building, thus providing an ideal enabling environment for the holistic development of the rural students.

NAF, as an Implementing Partner of BNY Mellon, executed the project activities in the school during 2018-19, the highlights are detailed below-

a. Four smart class room facilities set up
b. Toilet complex for girls constructed
c. Toilet complex for boys was renovated
d. Compound wall constructed for students' safety
e. Roofing of yoga class with metal roofs completed
f. Drinking water facilities (including digging of a bore well and setting up of overhead tank for storage) completed
g. Tiles flooring for class rooms laid
h. Solar powered lights set up
i. Fans and LED tube lights fixed in class rooms and other facilities
j. Playground levelled
k. School buildings painted
l. Tables and chairs provided for teachers
m. Levelling of school playground undertaken
n. Greening of school premises was undertaken through plantation activities

The upgraded facilities are used by the 700 children attending the Government school who come from fifteen villages around Kazhuperumbakkam village. The handing over of the upgraded school facilities was done by Shri Nitin Chandel, Managing Director & Head, BNY Mellon Technology (P) Ltd. on 19th of January, 2019 at an event organised in the school.

'Equipping the Schools' project under BNY Mellon Support

The project aimed at equipping selected needy schools comprising of Govt./ Govt. aided/ private schools with desktop computers and peripherals to impart quality computer education to their students and help for their career development in the long run. Under this project, 70 desktop computers, 55 UPS and one printer were purchased and distributed to six schools as detailed below-

- Govt. Hr. Sec. School, Vilathikulam, Thoothukudi district, TN
- Loyal Textile Mills Middle School, Kadalaiyur Road, Kovilpatti, Thoothukudi district, TN
- S V A Girls School, West Street, A.Thekkur, Sivagangai distrct, TN
- Govt. Hr. Sec. School, Kazhuperumpakkam, Villupuram district, TN
- PS Matriculation Higher Secondary School, Mylapore, Chennai

Laboratory Services Division

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The primary objective of the division is to promote evidence based scientific practices in agriculture, natural resource management and food sector. Agriculture research has been playing a major role in supporting farmers and farming in various ways world over. The beginning of science and laboratory-based agriculture research since the past two centuries was primarily used to help farmers increase their yield to meet the demands of a growing population and later on moving towards supporting for optimisation between costs and yields and now increasingly to understand the environmental effects. Soil testing has now become the norm to understand the health of the soil and provide form appropriate amendments that can help in restoring the vitality of the soil.

NAF had understood quite early the importance of scientific analyses for various parameters related to agriculture and food. NAF pioneered the setting up of modern laboratories for soil and food testing laboratories recognising the need for such technology intervention towards agriculture and rural development. NAF also has the distinction of being the first NGO in India to get accreditation in the area of agriculture soil testing. NAF is accredited by NABL, Quality Council of India as per ISO 1025:2017 standard in the areas of agricultural soil testing, food testing, water testing and organic fertiliser & biofertilizer testing.

The Soil Testing Lab and the Food Testing Lab of NAF has been providing vital leads to the area of agriculture and food to various stakeholders. The division also supports technical training and academic programmes to various stakeholders including farmers, students from education institutes, entrepreneurs, and food industries. The four broad categories that are catered to are-

Soil & Water Testing: NAF Soil Testing Lab has been providing comprehensive soil health diagnostic services for agriculture development for the past 19 years. Accurate information regarding the important natural resources soil and water is crucial to improve the agricultural activities. Our work under this division help the farmers, field level functionaries, and other partner organizations to discover ways to better manage soil and water resources for soil fertility and crop productivity enhancement and to reduce the loss due to sub-optimal crop production. NAF Lab also extends testing services for quality assessment of different organic fertilisers such as vericompost, city compost etc. as per the Fertiliser Control Order (FCO).

Food Testing: Analysis of food products and advisory for compliance to FSSAI Standards, nutritional analysis for labelling purposes, testing of Food & Water Samples for microbiological quality and swab samples for monitoring Good Food Hygiene, Sanitation and Personal Hygiene Practices etc. are taken up by the Food Testing Lab.

Training and academic programmes: NAF not only maintains the laboratories to International standards but also conducts awareness programmes, workshops on teaching and technical training programmes to enhance the skill and knowledge of a wide variety of participants from food enterprises, start-ups and students etc. NAF is an empanelled

training partner of FSSAI under Food Safety Training and Certification (FOSTaC) program and conducts Food Safety Supervisor training in various sectors.

R&D: NAF Laboratories also undertake applied research projects in the field of food and agriculture development.

Following are the salient features and the work undertaken during 2018-2019 under the laboratory division of NAF.

Soil Testing Lab

The NABL Accredited NAF Soil Testing Lab has been providing comprehensive soil health diagnostic services for agriculture development for the past 18 years. Analysis of Irrigation Water, Organic Fertilizer & Biofertiliser products are undertaken by the lab.

Highlights of the work undertaken by the soil testing lab this year are as follows:

Analytical Services

- Between April 2018 to February 2019, 1609 soil samples, 174 water samples and 398 other samples (compost, leaf, soil for texture etc.,) have been tested.
- Apart from samples from Tamil Nadu, soil and other samples from other states - Maharashtra, Andhra Pradesh, and Karnataka and were tested.
- Out of 1609 soil samples tested this year, 187 were for the NABARD Climate Proofing Projects, 844 for the 16 CSR Projects being implemented by NAF and 620 for other (including individuals and organisations) clients.

Research and Development

- A DST –SERB funded ECRA Project entitled "An Integrated Remediation Approach for Chromium Contaminated Soil and Waters in Vellore District, Tamil Nadu" is being executed with a total budget of INR 4,629,800. The first instalment

of INR 32, 60, 000/- was released on 3rd January 2019.

- Main aim of the project is to identify the hot spots of chromium contamination in Vellore District and develop an integrated remediation approach. Since phytoremediation is the core technology in this remediation approach, it is having environmental benefits as well as societal benefits.
- Instruments such as High-Performance Liquid Chromatograph and Centrifuge were purchased under the project
- Recruitment for manpower (JRF) has been initiated and will be completed in April 2019.
- Technical work such as soil and water sample collection from contaminated sites of six taluks of Vellore district, laboratory batch experiments to study the adsorption and desorption pattern of Cr in contaminated soils and analysis were completed during Jan –March 2019. The project is under progress and is expected to be completed by September 2020.

Food Testing Laboratory

The NAF Food Testing Laboratory was conceptualized to provide analytical services to the small and medium scale food industries. It helps in raising the general standards of quality particularly in the small-scale sector. Accredited with ISO/IEC 17025:2017 for Chemical Scope, the food-testing lab has been carrying out analysis of food products for compliance with FSSAI Standards & Nutritional Analysis for Labelling Purposes. The Microbiological laboratory is testing Food, Water, Soil and Compost samples for microbiological quality. Swab studies are conducted for monitoring Good Food Hygiene, Sanitation and Personal Hygiene Practices amongst food handlers.

Analytical Services

- Between April 2018 to March 2019, 322 food samples were analysed.
- 80 samples under microbiological scope were analysed.

Academic Services

i) Anna University

The NAF Food Testing Lab is Adjunct Laboratory for Anna University's B.Tech. and M.Tech. Food Technology Programmes since 2007 and for B.E Agri & Irrigation Engineering Programmes since 2014.

- Laboratory sessions for B.Tech. Food Technology students were conducted between
- August to October 2018 and was attended by 34 students.
- Advanced Food Analysis Lab practicals for M.Tech. Food Technology students were

- conducted between July to August 2018 and was attended by 25 students.
- Laboratory sessions for B.E Agri Irrigation Engineering commenced in December
- 2018 and is in progress with fifty-two students. The model and end semester
- practical exams for this batch will be conducted in the last week of March 2018.

ii) IGNOU

The NAF R & D centre is a registered programme study centre for IGNOU's PG Diploma in Food Safety and Quality Management programme since 2013.

- Chemical and Microbiological Lab counselling sessions were conducted for 28 students of IGNOU PG DFSQM batch 2017 and their performances were evaluated.
- Theory and Practical counselling sessions for the 2018 batch is in progress and 32 students have registered for the programme this year. The sessions commenced in December 2018 and will extend until May 2019.

iii) Training

- Eleven under graduate students who aspire to join the food industry have undergone one-week hands-on-training on chemical analysis of foods for nutritional details. Ten Food Technology students have undergone internships at the food testing facility.
- Five Food Technology students are undergoing end semester project at the food testing facility.

iv) Research & Development

The following are the research output of the Food Testing Lab-

- A research paper titled "Study on Food Safety Knowledge, Attitude and Practices followed by Street Food Vendors in Chennai" has been published in the International Journal of current Research, Vol. 10, Issue, 11, pp.74927-74929, November, 2018. DOI: https://doi.org/10.24941/ijcr.29101.11.2018.
- A research paper titled "Studies on an alternative method for preparation and fermentation of idlis made from proso millet (Panicum miliaceum), Horsegram (Macrotyloma uniflorum) and fenugreek (Trigonella foenum-graecum)" has been submitted to the journal of LWT - Food Science & Technology, Elsevier publication and is under the process of peer review.

Empanelment and Collaborations

FoSTaC Training

NAF has been empanelled as Training Partner with FoSTaC by FSSAI for Basic, Advanced and special Food Safety Supervisor (FSS) training courses which includes the following levels-

Basic Level

- Street Food Vending
- Catering
- Manufacturing

Advanced level

- Catering
- Manufacturing/Processing
- Retail and distribution

Special level

- Milk & Milk products,
- Bakery
- Edible oil
- Water and water-based beverages

During 2018-19, 12 Food Safety Supervisor (FSS) trainings covering 351 participants have been conducted. The topics included Manufacturing – Basic & Advance, Catering – Basic, Milk & Milk Products – Special.

The sessions were attended by representatives from various industries, scholars pursuing doctoral degrees, graduate and post graduate students. The participants from industries included Lotte India Corporation Limited, Dr. Mohan's Healthcare Ltd, Centre for Indian Knowledge Systems, Sri Annapoorani Public Charitable Trust, Archana Sweets, Bob Massy and CK's Food India limited. Others included students from Anna University M.Tech and B.Tech Food Technology, Ph.D scholars from Department of Biotechnology, students from the College of Food and Dairy Technology and students from MOP Vaishnav college for women.

Exclusive customized trainings were conducted for M/s. Hatsun Agro Products Limited and to Green Pearl Management Consultants – the catering wing of SRM group of Hotels.

In addition, a NAF self-sponsored programme in basic catering was conducted for women SHG members at NAF project office, Madharpakkam for 24 women entrepreneurs.

FoSTaC Plus

Additionally, NAF, FTL has also applied for the empanelment of FoSTaC Plus. It is a participatory programme for training and capacity building for the employees of middle and senior management level of FBOs and is designed to provide comprehensive knowledge of Schedule IV as well as other regulatory provisions of FSSAI. NAF has applied as the knowledge, mobilization and implementation partner for Food Start up programmes and programmes for Organic Food businesses. Empanelment is awaited from FSSAI for FoSTaC Plus.

MoU with IIT Madras

Further to the MoU signed with IIT Madras to develop a low-cost sensor for assessing the quality of milk, 41 milk samples from different sources have been tested. The results derived from the sensor will be validated against conventional test methods for specified parameters and the applicability and suitability at field conditions will be studied.

Awards & Accolades

NAF & BNY Mellon Technology India Ltd.received the runner-up award for the best CSR Project from the Madras Chamber of Commerce & Industry (MCCI) at the MCCI-TAFE CSR Awards 2018, for the Flood Rehabilitation Project implemented by NAF for the people affected during Chennai Floods 2016 with CSR support from BNY Mellon Technology India Ltd.

Other Events

Corporate Volunteerism Program

NAF is implementing many community development programs through Corporate Volunteerism. Corporate volunteering is the encouragement and facilitation of volunteers in the community involving the employee to donate their time and expertise either during official work hours or their own time with some facet of company support. Volunteer programs organized by NAF are well recognized and valued programs that helps corporate companies work more effectively and deepen the engagement of employees with community and contribute to the company's visibility and reputation.

A) BNY Mellon Technology Pvt. Ltd. Volunteerism Program

As a new initiative, BNY Mellon (BNYM), for the first time in its history organised a mega volunteerism event by involving all its employees from all over India on 4th July 2018. As part of it, 885 volunteers from BNYM Chennai Office participated in the event held to extend their support for community development programs in 10 NAF project villages in the vicinity of the NAF Centre for Rural Development. They helped in tree planting, seed ball preparation, seedling preparation, strengthening of canals, digging of farm ponds etc.

On the same day, 437 volunteers from the BNYM Pune office participated in the program organized at Adavali village, Velhe Taluk, Pune District, Maharashtra. As part of this volunteerism program, participants created Water Absorption Trenches (WAT) in the upper reaches of the watershed to help harvest water during monsoon and also planted trees to afforest a hillock in the village. The program was marked by the overwhelming participation of the local people.

Apart from this mega volunteerism program, six volunteerism programs were held in Kancheepuram district, Tamil Nadu and Pune district, Maharashtra, wherein 219 volunteers participated in activities like seedling preparation, strengthening of canals, digging of farm ponds, creating water absorption trenches, and painting of rural school buildings etc.

Another BNY Mellon group company, Eagle Investment Systems celebrated their Global Day of Service on September 26, 2018 by contributing their time and efforts for 'Swachh Bharat'- Cleanliness Drive & Tree Planting around the waterbody near the Ellen Sharma School at Sholinganallur, Chennai. The program was organized by NAF wherein 26 volunteers from Eagle Investments participated in the event.

B) Pershing India Volunteerism Program

Pershing India Operational Services Pvt. Ltd., a subsidiary of The Bank of New York Mellon Corporation joined hands with NAF under Corporate volunteerism. 78 of its employees along with NAF initiated many community volunteers' programs such as cleaning remote village schools' premises, planting of trees along farm ponds, lakes, farm bunds etc., in three volunteering programs organized for them.

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