ANNUAL REPORT
2018-19

REVIVING GREEN REVOLUTION CELL

(Associate Organization of TATA TRUSTS)

An Initiative of **TATA TRUSTS**

GOVERNING BODY

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Member	:	**Dr. N. Kumar** Vice Chancellor, Tamil Nadu Agricultural University, Coimbatore
Member	:	**Dr. Sutantar Kumar Airi** Director of Agriculture, Punjab
Member	:	**Dr. Jaskarn Singh Mahal** Director of Extension Education, Punjab Agricultural University, Ludhiana
Member	:	**Mr. Ashish Deshpande** Chief Financial Officer Tata Trusts, Mumbai
Member	:	**Mr. Arun Pandhi** Director - Program Implementation, Tata Trusts, Mumbai
Treasurer	:	**Dr. A.S. Dhatt** Senior Advisor- Agriculture, Tata Trusts, Mumbai
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Member	:	**S. Avtar Singh Dhindsa** Progressive Farmer
Secretary	:	**Dr. G. S. Chahal** Executive Director, Reviving Green Revolution Cell

PREFACE

The phenomenon of Green revolution through the adoption of high yielding varieties of wheat and rice resulted in phenomenal increase in food production in India. It, however, lead to a large scale adoption of Rice -Wheat Cropping System that has created a serious problem of fast deteriorating soil health and depletion of water resources. It thus became inevitable to divert substantial area under these crops to other less water requiring crops like cotton, maize, pulses, oilseeds etc. for sustaining the production potential of Punjab soils. But all efforts to diversify agriculture failed to reverse this status of agriculture in Punjab. It was at this stage that Tata Trusts, Mumbai started the initiative "Reviving the Green Revolution" through financial support to Punjab Agricultural University during 2002-2005 and then through Department of Agriculture, Punjab in Phase-II from 2005-2008. The Trusts established a centralized body in the form of Reviving Green Revolution Cell at Punjab Agricultural University, Ludhiana in 2008 for an active participation of Trusts for the betterment of agriculture and farming community. The operation of projects especially on IPM in cotton and basmati has been so successful that a Regional Center of the RGR Cell was also established at TNAU Campus, Coimbatore to replicate the success stories of Punjab to other states of Southern and Central India. Agencies like WWF-India have also joined hands with RGR Cell for further supporting cultivation of Better Cotton with reduced input use and optimum resources utilization.

The RGR Cell has been operating namely projects like Integrated Productivity Management on cotton and basmati based cropping systems, Nutrition Gardening, linkage of farmers with market and mobile based agro-advisory (mKRISHI) for long term sustainability and impact of Trusts' supported initiative. The RGR Cell has now undertaken a new initiative on Crop Residue Management through use of Happy Seeder technology. During the current year, the RGR Cell laid main emphasis on finalization of workable model of mKRISHI for transfer of technology to ensure large scale adoption. All other Trusts' supported projects in PAU and TNAU are also executed through RGR Initiative with a responsibility of regular field visits and reviews. In addition, the RGR Cell provides technical support to other agriculture based interventions under other associated organizations of the Trusts. This Annual Report of the RGR Cell is compilation of all such activities undertaken by the RGR Cell during 2018-19. The technical support provided by Dr. AS. Sohi, Advisor Agriculture and Ms. Khorshed Talati, Team Leader (RGR RC TN) in preparation of this report is highly appreciated. I owe my personal gratitude to Mr. Baljinder Singh Saini, Area Manager (Punjab, Dairy, DHANII); Mr. Kulbir Singh Brar, Area Manager, Mr. Harmandeep Singh Area Manager, Mr. Tam Lal Pokharel, Grant Manager; all Consultants; Agriculture Development Officers; Field Officers for gainful utilization of the grants and for providing the technical input for the preparation of this report. A special mention needs to be made of generous cooperation and support of Director of Agriculture, Government of Punjab, for all the financial and operation support in the implementation of the projects. The financial support of WWF-India and Tata Trusts is acknowledged with great sense of gratitude.

D. S. Brar
Executive Director

CONTENTS

Reviving the Green Revolution (RGR) Initiative

The advent of Green Revolution during 1970s resulted in phenomenal increase in agricultural production that made India food sufficient. Punjab alone witnessed an eight-fold increase in food production from 30 lakh tons in 1961 to 2.53 crore tons by 2000. The technologies that accompanied the Green Revolution, however, led to excessive use of agrochemicals and overexploitation of subsurface water, especially for cultivation of rice, which made agricultural production of Punjab unsustainable and grossly uneconomical. The State Government constituted the Johl Committee in 1985, under the Chairmanship of noted economist Dr. S. S. Johl to provide solutions. The report suggested the replacement of at least 150,000 hectares under paddy to lesser water intensive crops such as Basmati, Cotton, Maize, Vegetables, etc. However, due to lack of political will, these were never implemented on a scale which could fulfill the purpose of setting up the Committee. This notwithstanding, some alternative crops could be adopted with assurance of their economic viability, provided it was well demonstrated to farmers. The most viable alternative for diversification in agriculture was to divert area under paddy cultivation to cotton. However, the scourge of pests raised its ugly head and recurrent attacks resulted in heavy crop loss, low yields and even failure of cotton crop. The farmers countered this through a two to three fold increase in number of pesticide sprays that not only resulted in increase in pesticide residue and environmental damage, but also increased cost of production with very low economic returns.

Amidst this bleak scenario, the Trusts operationalised 'Reviving the Green Revolution (RGR)' initiative in Punjab in 2002, to seek solutions to arrest the stagnation in agriculture that had set due to the above said reasons. It aimed at bringing diversification in agriculture by shifting some area from predominant cropping system of paddy-wheat cultivation to popularize less water consuming crops as an economically viable alternative to paddy; reduction in cost of production; value addition to crops to increase profitability from farming; conservation of natural resources especially soil health and sub-surface ground water; and protecting the environment from pesticides and pollution caused by crop residue burning.

The financial support of the Trusts (2002-15) to Punjab Agricultural University, Ludhiana; Department of Agriculture, Government of Punjab; and the RGR Cell to promote “Diversification” led to standardization and adoption of Integrated Pest Management (IPM) technology in Cotton and Basmati rice for profitable cultivation of these crops, in place of rice. Large scale demonstration of IPM has led to increase in income from Rs. 46,000 to Rs. 173,000 per household for cotton and from Rs. 150,000 to Rs. 300,000 for basmati. Since the entire cotton and basmati growing areas of Punjab are sown under wheat crop during the Rabi season, the extension of the Integrated Productivity Management Approach in Cotton-Wheat and Basmati-Wheat based cropping systems has further enhanced the income of the project farmers to Rs. 281,192 and Rs. 440,000 under the two Cropping Systems, respectively. The successful operation of these interventions under Cropping Systems approach has been demonstrated in eight Clusters of 25 villages each under Cotton-Wheat and Basmati based cropping systems.

Since the beginning of the initiative in 2002, it has resulted in adoption of 1,200 Cotton-growing villages for demonstration of Cotton IPM technology at village level and leading to

[1]Tata Trusts

[2]The Reviving Green Revolution (RGR) Cell is a Registered Society under the Societies Act.

mass scale impact. One educated youth from each adopted village was trained and deployed as a Scout for providing readily available agro-advisory during, as well as after completion of projects. Similarly 150 villages (across the Basmati belt in Punjab) were adopted each year (2009-12) for popularization of IPM in Basmati. Village level demonstrations were conducted to popularize cultivation of Groundnut, Moong, Maize, and Vegetables. Five Self Help Groups (SHGs) of farmers were established, which now are registered as Producer Companies, for adequate and profitable marketing (which was the main hurdle in the adoption of these crops). A total of 5,00 Nutrition Gardens were also established for year round availability of home grown vegetables for enhanced consumption and nutrition of each family.

Impact created through the initiative

- Cultivation of Cotton was revived and annual production increased to over 20 lakh bales (compared to 10.8 lakh bales at the start of the project), which generated additional annual revenue worth Rs. 750 crore to the economy of the State.
- An effective pest control was achieved even with 40-45% reduction in use of pesticides, giving an additional income of Rs. 11,500/ per ha, with an additional income of Rs. 57.50 crores from an area of 50,000 hectares, covered each year under the project.
- Additional employment worth Rs. 75 crores per annum was generated for picking of Cotton for women of landless families.
- Adoption of the new Clustering Approach amidst clusters of 100 contiguous villages for the entire Cotton-Wheat cropping system provided an additional income of Rs. 2.3 lakhs per household over the baseline income.
- The Basmati IPM project provided an additional income of Rs. 17,000 per hectare over an area of 50,000 hectares under Basmati with additional annual income of Rs. 85 crores to the Basmati growing farmers in project areas.
- Cleaner environment due to reduced use of pesticides under IPM led to an increase in honey bee colonies from 9,700 to 30,000 and consequent increase in honey production from 1,780 tons to 14,000 tons during this period.
- The Indian Cotton Textile Industry honored the Trusts with a Special Award at the Indian Cotton Conference during November 2013 for their contribution towards enhancing social welfare of Cotton farmers.
- Each Nutrition Garden provided, on an average, 300 kilograms of vegetables, thereby leading to savings of Rs. 7,300 per household per year – an amount which each family would have otherwise spent for purchasing vegetables from the market.

Besides the direct impact, the initiative was successful in creating indirect impact with the Trusts' Associate Organizations through conducted field visits in implementation of agriculture-related projects as well as review and substantial improvement in the quality of finalized Annual Work Plans through provision of technical inputs.

REVIVING GREEN REVOLUTION CELL

The Cell, established in 2008, is now a registered body housed in PAU with formal institutional structure and is responsible for prioritization of thrust areas of funding by the Trusts in the country, besides monitoring progress of ongoing projects. The most critical gaps limiting income from commonly used agricultural practices of a particular area are identified where suitable interventions have an obvious scope for noticeable enhancement in

livelihood of small and marginal farmers. The most appropriate agricultural interventions are then identified and validated through the concerned local Agricultural Research Institute like PAU (Punjab Agricultural University) in Punjab and TNAU in Coimbatore. The further large scale popularization of such technologies is then taken up in collaboration with State Departments of Agriculture (DoA), Directorate of Horticulture (DoH), other partner Organisations of the Trusts such as PAU and other agencies such as WWF, India. All such activities are undertaken under the technical guidance and supervision of the RGR Cell as Nodal Agency.

Key Objectives/Mandate of RGR Cell

- Support large scale activities for adoption of technologies by the farmers in prime areas of concern in agriculture
- Support development departments of state governments and the private sector in frontline extension activities for increasing agricultural productivity and augmenting economy of farmers
- Support activities that build market linkages of farmers, growth of subsidiaries and encourage agro-based entrepreneurship
- Support researchable issues in agricultural universities to fill in the gaps of agricultural technologies developed. Cell is now responsible for prioritization of thrust areas of funding in PAU and TNAU, besides monitoring progress of ongoing projects. Besides implementing key projects on promoting crop diversification, the Cell also act as an idea incubator for developing potential sustainable agriculture technologies.

Organizational Set-up

The RGR Cell, Ludhiana is headed by Executive Director (ED) and supported by Advisor Agriculture and Area Manager (Punjab, Dairy, DHANII). The Cell's annual budget during 2018-19 was around Rs 4.5 million, which included the budget for the fully functional Regional Centre (RC) established in 2010 at TNAU, Coimbatore to provide impetus to RGR Initiative in Tamil Nadu. This budget is excluding that on projects being implemented by RGR Cell. The ED also functions as the Secretary of the Governing Body of RGR Society. With respect to the RGR programme, the ED, reports to the Director – Program Implementation, Tata Trusts and the Governing Body of the RGR Cell. The total staff in RGR (Punjab) at present is eighteen, including an Advisor-Agriculture, two Consultants, two Area Managers, two Agriculture Development Officers, seven Field Officers, one Grant Manager, one Account Officer, two Computer/data entry Operators. The Regional Centre, RGR Cell in Coimbatore, Tamil Nadu is supervised by Team Leader, RGR Regional Centre under the guidance of Executive Director, RGR Cell.

The total staff in RGR (Tamil Nadu) at present is four, including One Project Manager, one Field Officers, One Officer-Grant management, and one Data Entry Operator based in Coimbatore.

The Hierarchical HR Structure of Reviving Green Revolution Cell is as follows:

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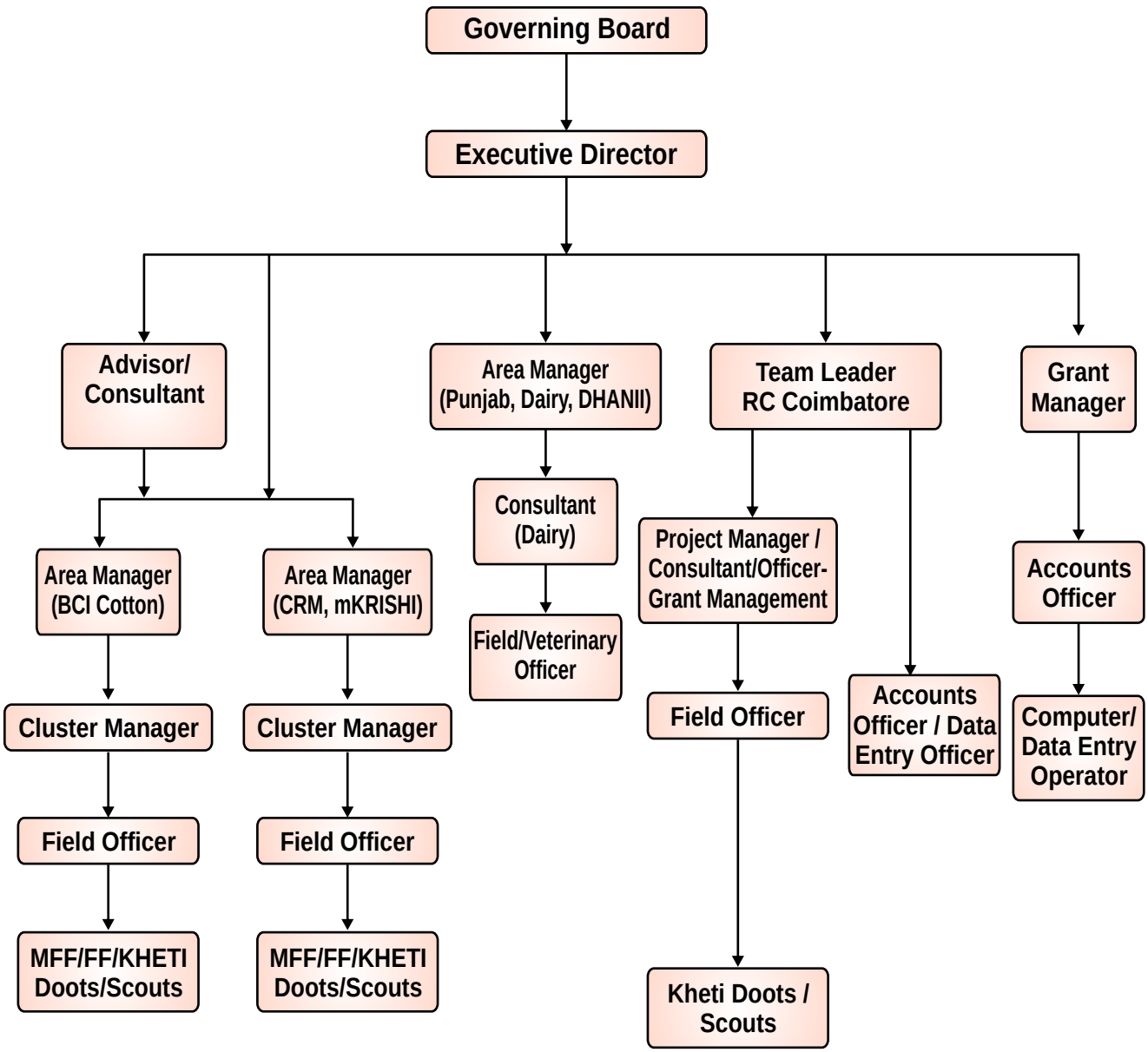


Governing Body Meetings

Reviving Green Revolution Cell held its 24th & 25th Governing Body Meeting on September 12, 2018 and March 22, 2019, while the 12th Annual General Body Meeting of the Society was held on September 12, 2018.

RGR Cell Partners

RGR Cell has established a wide strategic support division, which includes various partners viz. Departments in Punjab Agricultural University (PAU), Ludhiana; Department of Agriculture (DoA), Government of Punjab, Chandigarh and Government of Tamil Nadu, Chennai; Directorate of Horticulture (DoH), Punjab; World Wide Fund for Nature (WWF), New Delhi and Tamil Nadu Agricultural University (TNAU), Coimbatore. The Cell is headquartered in Ludhiana and has setup its Regional Centre in Coimbatore, Tamil Nadu in October 2010.

Key Areas of Interventions:

- Dissemination of farm adoptable model of technologies for small and marginal farmers for improving their livelihood in Punjab and Tamil Nadu.
- Dissemination of Integrated Productivity Management technologies for cotton, basmati, vegetables and other alternate crops to achieve targets set out in RGR initiative for diversification of agriculture to sustain land and water resources as well as improve human health and environment.
- Facilitation of marketing of alternate crops for sustaining the diversification process and improving the economy of small and marginal farmers.
- Expansion of RGR initiative to replicate the success stories.
- Cropping System instead of Crop based interventions

Operational Areas / Mode of Operation of the RGR Cell

1. **Nodal agency for projects implementation:** RGR Cell directly implemented projects on Integrated Productivity Management of Cotton-Wheat Cropping System; Better Cotton Initiative project; Basmati based Cropping System project; Crop Residue Management project directly through its own field staff in collaboration with DoA, Government of Punjab. In 2018-19, the RGR Cell, which functions as an idea incubation unit for the Trusts, implemented of mKRISHI® - a mobile-based agro-advisory service. The integration of Information Technology in agriculture aims at bringing about sustainability of agricultural interventions, by ensuring that farmers continue to receive latest University recommended techno-advisory and don't have to depend on local agri-input dealers for information.
2. **Monitoring/Review of the Projects:** Besides supervising its own field projects, the RGR team is also actively involved in monitoring of Trusts' projects run by Tata Trusts associate organisations besides its Regional Center projects in Tamil Nadu. The Team conducts regular project reviews and provideds recommendations for improvement. The Action Taken Report is also shared by RGR team for follow-up.
3. **Evaluation of the Impact of the action taken:** Under each sub theme of the RGR initiative, the professional teams are involved in project implementation, monitoring the progress, providing

technical inputs and collating the output and impact to meet the targets. The teams are closely involved in generating data on the interventions and simultaneously the Impact Assessment Studies by independent expert(s) and Third Party Monitoring and Evaluation (M&E) are also undertaken.

4. **Keeps complete audits of the funding:** A complete financial record is maintained by RGR and is regularly audited as well. The RGR Cell has also internal auditor deputed by Tata Trusts.
5. **MoUs with partner organizations:** The RGR Cell signed Memorandum of Understanding with WWF, India on July 06, 2018 for the implementation of Better Cotton Initiative project in 410 villages (10 Producer Units).

Operational Strategy

Operational Strategy : The most appropriate agricultural interventions are identified and validated through the concerned local Agricultural Research Institute like Punjab Agricultural University (PAU) in Punjab and the Tamil Nadu Agricultural University (TNAU) in Tamil Nadu. Large scale popularization of such technologies is then taken up in collaboration with State Departments of Agriculture and through other partner Organisations of the Trusts. All such activities are undertaken under the technical guidance and supervision of the RGR Cell as Nodal Agency. Regular monitoring of operations and even a periodic field review is conducted to assess the impact and mid-term modifications, if so required.

Mr Arun Pandhi, Director-Program Implementation and RGR Team reviewing demonstration of Happy Seeder Technology

Part 1 : RGR (Punjab)

Programme Goals & Objectives for 2018-19

Entire Cotton and Basmati growing area of Punjab is sown with a succeeding second crop Wheat. The successful operation of IPM approach to cover the entire Cotton - Wheat and Basmati - Wheat based cropping system has been well demonstrated. This further needs to be extended to larger area covering the crop cycle for ensuring noticeable diversification in agriculture of Punjab.

Basmati and Cotton which have been promoted on larger area for crop diversification are relatively less prone to market uncertainties. All other possible alternatives of paddy need some kind of marketing intervention to make them economically competitive with the prevailing assured and remunerative system of marketing for rice. Consequently, the Producer Companies (PC) have been nurtured for ensuring profitable price recovery and ensuring adequate market clearance for all crops which do not fall under the Minimum Support Policy. These PCs, however, need to be further strengthened for coverage of the larger farming community and the scale of business. The team of agricultural experts at the RGR Cell can provide technical support to all the Trusts' funded projects, involving agriculture-based livelihoods. There is also an urgent need to prioritize region-specific critical agricultural problems along with the most appropriate solutions, in order to plan need-based interventions with suitable human and financial resources.

Coverage Target

Theme	Collaborating institutes	No of districts	No of villages	No of HHs	Area (Ha)
Cotton-Wheat cropping system	Tata Trusts; Department of Agriculture (GoP) ; PAU; BCI; WWF	6	900	235,000	500,000
Basmati based cropping system	Tata Trusts; Department of Agriculture (GoP); PAU	3	600	80,000	120,000
mKRISHI	Tata Trusts; Tata Consultancy Services (TCS)	9	--	3,00,000	--
RGR Cell (Punjab) _ Market Linkages#	Tata Trusts; ATMA	4	5	5,000	--
RGR Cell (Punjab) _ Knowledge Resource Center	Tata Trusts	--	--	--	--
Crop Residue Management Project#	Tata Trusts	7	420	42,000	--

Project villages from ongoing districts

Intended Outcome/Impact

Integrated Productivity Management for Upscaling the Cropping Systems

The project on 'Integrated Productivity Management for Upscaling the Cropping Systems Approach targeted to cover 320,000 households across 1,500 villages in 9 districts in cotton and basmati growing areas in Punjab as given below. Detailed list of Blocks is given as Annexure-I.

S.No	Indicators	Target	Achievement as on March 31, 2019
1	**Outreach**		
1.1	Total number of Villages covered	1,500	1,594
1.2	No. of Household	3,20,000	3,05, 303
1.3	No. of Districts	9	9
1.4	Area covered (Ha) under Cotton-Wheat, Basmati based Cropping System and Marketing project	620,000	6,43,328
2	**Impact**		
2.1	Annual Gross Income (Rs. / HH)	354,000 (Cotton-Wheat) 539,000 (Basmati based Cropping System) 109,000 (Marketing)	4,30,389 (Cotton-Wheat) 5,53.258 (Basmati based Cropping System) 109,000 (Marketing)
2.2	Reduction in agrochemicals use (%)	40-45	21 % in Cotton-Wheat and 95% in Basmati-Wheat (More pesticides application in cotton shrinked the % reduction)

PROGRESS OF RGR INITIATIVE IN PUNJAB

Integrated Productivity Management in Cotton-Wheat Cropping System

Key achievements:

- A total of 600 villages spread over six traditional cotton-growing districts of South-Western Punjab were adopted to implement the project activities.
- Out of the total 20,379 farming families adopted in the 200 direct implementation villages, 75.7 percent belonged to general category, 8.7 percent to the scheduled caste (SC) and 15.7 per cent to the backward class (BC) category
- Under this project, 1,45,374 farming families were covered through Radio Talk, mKRISHI, information material (leaflets & brochure) and need based field visits.
- At village / block level 1,542 farmer training camps were organised to mobilize the farmers for the adoption of recommended practices.
- More than 21 percent reduction in the number of sprays was recorded in cotton crop, which may be attributed to the adoption of recommended IPM technology by the adopted farmers in the project villages.
- Participatory farmers incurred 17.2 percent less expenditure on pesticides in comparison with the non-participatory farmers. This may be ascribed to the proper identification of insect-pests and judicious use of recommended pesticides based on economic threshold levels.
- Participatory farmers, using recommended agronomic practices along with integrated nutrient management (INM) and integrated pest management (IPM) were able to grow healthy crops and recorded 11.5 percent more yield.
- With the judicious use of inputs and due to increased yield, participatory farmers earned 18.7 percent higher net profit over the non-participatory farmers.

Scouts Training at PAU

Farmers at Cotton field day

- Mass awareness tools like radio talks, mobile-based advisory etc. were used regularly to acquaint farmers with improved cultivation practices of cotton and wheat.
- Regular monitoring of Cotton pests by Kheti Doots and periodic reviews by experts, provided necessary feedback to PAU and DoA to manage the pest attack.
- Existing partnership with PAU and DoA was strengthened with increased credibility of RGR. Scout model was well appreciated and village youth trained by RGR were deployed by DoA with additional grant.

Integrated Productivity Management in Basmati based Cropping System

Key achievements :

- In Basmati belt 210 villages spread over 7 blocks, 210 villages spread over six blocks and 180 villages spread over 6 blocks were adopted from Amritsar, Gurdaspur and Tarntarn districts, respectively. In traditional basmati growing belt, 65,758 farming families were adopted from 600 villages.
- Due to mass awareness compaign, 100 percent adoption of seed and nursery treatment has been achieved in the adopted villages.
- Adoption of high yielding varieties and judicious use of various agri inputs increased crop yield. The participatory farmers earned 34 percent more net profit over the non-participatory farmers.
- In wheat, participatory farmers recorded 8.7 percent increase in yield and 13.6 percent more net profit in comparison with the non-participatory farmers.

Better Cotton Initiative Project

The RGR Cell in partnership with WWF-India envisages BCI programme "Promoting Sustainable Cotton Production with Smallholder Farmers in cotton growing districts of Punjab" that focuses on improving economic status of cotton growers by equipping them with the latest technical know-how for reaping enhanced yield of cotton with better quality by avoiding wasteful expenditure on inputs leading to increased profit.

Root treatment against foot rot of Rice

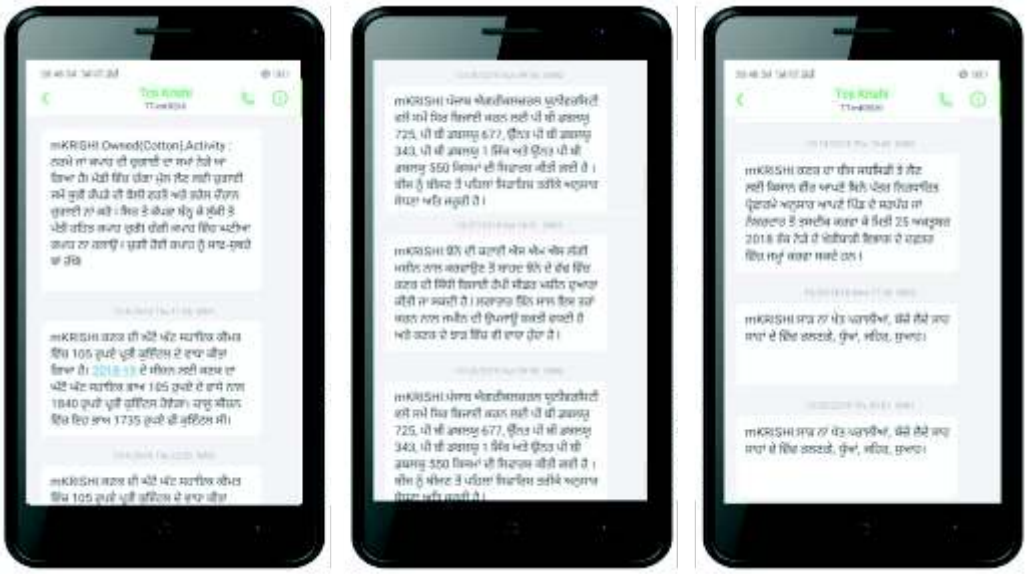
The project was implemented by engaging 41,304 farmers to form 1174 learning groups (LGs) in 10 Producer Units (PUs) covering 1,81,854 acres of cotton.

- Learning group (LGs) farmers' meetings 4,696 were organized by Field Officers and the Field Facilitators in all the ten Producer Units (PUs). During these meetings, the farmers were familiarized with the latest techniques concerning judicious use of fertilizers, efficient irrigation water, efficient management of weeds, diseases and insect-pests in cotton while sustaining soil health.
- Eight hundred special camps regarding safe use of insecticides, clean cotton picking, decent work including elimination of discrimination among labour, freedom of association, child labour were organized to train local and migrant farm workers.
- In order to sensitize the school children about the child rights, negative impacts of child labour in cotton, training programmes were arranged in different schools in the adopted villages.
- World Environment Day was celebrated on June 05, 2018 by distributing and planting 1000 saplings in Shri Muktsar Sahib and Fazilka with the support of Forest Department, Punjab. Saplings were planted in common places and the FFs were asked to monitor aftercare of the planted saplings. It is worth mentioning that two of our field facilitator and nine BCI Farmers of Bathinda district were awarded by Deputy Commissioner, for having not burnt wheat and paddy straw in the field, during a function organized by the Bathinda District Administration and the Punjab Pollution Control Board at Central University of Punjab.

Child labour awareness programme in schools

RGR experts inspecting the crop

Deployment of IT tools for transfer of Technology: Through mKRISHI, RGR Cell has been able to further strengthen the mass awareness approach and it has been coupled with the activities of Integrated Productivity Management (IPM), Better Cotton Initiative (BCI), Dairy Mission and Crop Residue Management (CRM) projects. The main emphasis was on registering more number of farmers and to get it modified as per farmers' requirements. An extensive interaction with the TCS through personal meetings and workshops took place to get the required changes.



Screenshots of mKRISHI Android APP

Key achievements :

- Mobile based agro advisory service mKRISHI® deployed across 1425 villages spread over 9 districts of Cotton and Basmati belts of Punjab.
- Keeping focus on building farmer database, details of 78,000 farmers were collected. 1,77,862 farmers have been registered and are making use of this service.
- Crop protocols for Cotton, Rice, Basmati and Wheat were developed and delivered through text and voice messages to the concerned farmers.
- Further, improved cultivation practices for Kinnow, key potential vegetable crops like tomato, potato etc. have also been shared through need based alerts.
- Information pertaining to dairy and the crop residue management was shared through alerts.
- To popularize mKRISHI service among farmers, 3,576 village level meetings have been conducted across nine districts.
- Key focus was on the further refinement of the mKRISHI service as per farmers' need. In this regard, a number of advanced features and changes were suggested to TCS and few of them have already been developed and deployed.
- Timely information was shared through Agri news module for farmer APP. This module is very helpful to keep farmers informed about various agriculture and allied sector related updates.
- During 2018-19, 13.2 million text messages and 1.6 voice calls have been delivered to the registered farmers.

Sr. No.	Key Parameters		Target	Achievements
1.	Outreach	States	1	1
		Districts	10	9
		Villages	2000	1425*
		Farmers	3,00,000	1,77,862*
2.	Scout training		2	2
3.	Village level farmer training camps		2800	3576
4.	Data Collection for farmer registration		1,00,000	78,000*
5.	Advisory Count	Text	#	1,32,97,296
		Voice	#	16,88,289

*Under achievement is due to delay in the disbursement of funds required for building farmer database to increase the outreach of mKRISHI service.

Flex showcasing IVR and Android based services

Crop Residue Management:

Burning crop residue causes phenomenal pollution problems in the atmosphere besides affecting soil health adversely. Apart from loss of nutrients, some of the soil properties like soil temperature, pH, moisture, available phosphorus and soil organic matter are greatly affected due to burning. Nonetheless, time available between the rice harvesting and wheat sowing is very narrow and in the range of 20-30 days. It is envisaged that appropriate strategies for in situ crop residue management are planned for effective implementation to enable zero burning. Various machines such as Super Straw Management System (SMS) attached with combine harvester, Happy Seeder, Mulcher, Reversible M B Plough, Rotavator etc. have been developed but these technologies need to be demonstrated in the farmers' field and awareness need to be created among farmers about the benefits of in-situ crop residue management.

Considering the delay in the disbursement of funds from Tata Trusts, the targets anticipated to be achieved under the original plan have been revised according to the actual availability of Happy Seeder machines. The project structure for the coming years, however, shall remain unchanged:

Key achievements :

- Implemented the project activities in four districts i.e. Fazilka, Bathinda, Mansa, Muktsar in cotton belt and three districts i.e. Amritsar, Gurdaspur, Tarntarn in basmati belt.
- In every district, 4 clusters of 15 villages each have been adopted on the basis of cropping pattern and geographical location. Further in each cluster, five villages are under direct implementation and 10 villages are under mass community mobilization. Accordingly, 420 villages comprising 28 clusters spread over the 7 districts have been adopted. Remaining villages in each district are being covered by using mKRISHI and advance tools of ICT.
- A Total of 56 village youths have been appointed as Kheti Doots in 28 clusters to implement the project activities in 420 villages
- The number of farming families adopted in 420 villages under direct and mass mobilization approaches through ICT i.e. mKRISHI was 83,207. A total of 1,77,862 farmers have been covered across the project area.
- The farmers have serious apprehensions of low germination and optimal crop establishment of wheat sown by Happy Seeder under the anticipated pressure of recycled rice straw. So to dispel this feeling 1260 field demonstrations of straw management technology were conducted in the project villages by using machinery available with the farmers and with other stakeholders. These demonstrations were more focused on the in-situ straw management technologies.
- Created awareness about the impending benefits of in-situ crop residue management through mKRISHI service. Alerts in the form of slogans were sent to all the registered farmers. The detailed package of practices for Happy Seeder sown wheat crop has also been incorporated in the wheat crop protocol.
- Facilitated the farmers to get information about the availability of machinery and the contact person through agri news.
- Since, machinery is the key to manage 20 million tons of paddy straw in a short span of 20 days and full utilization of the available machinery is essential, mapping of all the existing machinery in the project villages has been carried out by the field team, to expedite the efficient use.
- A total of 1688 village level farmers' meeting/camps were organized to create awareness among farmers the benefits of straw management and about the advanced straw management technologies.

Demonstrating Happy Seeder Technology

Tata Dairy Mission

Under the Tata Dairy Mission, the Trusts are partnering with "Dairy Health and Nutrition Initiative India Foundation (DHANII)" - a Section 8 Company - to sustainably enhance incomes of milk producers by building their capacity vis-à-vis milk production, animal health, breed improvement and animal nutrition. To ensure fair prices for their milk, these producers are being organized under Producer Companies, which are equipped with latest technologies, infrastructure and assured market linkages.

During 2018-19, Five Milk Producer Companies (MPCs) were fully operational in Rajasthan (2), Punjab (1), Maharashtra (1) and Uttar Pradesh (1) with technical support from NDDB Dairy Services (NDS). In addition, 85 villages from CSPC catchment area in Gujarat were linked with MAAHI Milk Producer Company.

In Punjab, as part of the backend support programme which was designed in discussion with Tata Trusts and NDDB Dairy Services, RGR Cell focused support in 45 villages in Budhlada block of district Mansa, building capacities of Dairy farmers and linkage with procurement system of existing Milk Producer Company for better price realization. Around 64 farmers meeting were conducted in 40 villages covering around 1600 farmers. Three Mini Dairy Farms-cum-Learning Centres were also operationalized and 144 farmers trainings were organized at these centres. The advisory included Animal health and general care, Feed & Nutrition, Breed improvement and Clean milk production etc. The need based advisory also issued via IT platform mKRISHI.

RGR team educating dairy farmers on animal husbandry aspects

Activity/Parameter	Annual Targets	Targets YTD Mar'19	Ach. YYTD Mar'19	% Ach YTD
No. of villages covered (cum)	45	45	40	89
Farmers awareness meetings	90	90	64	71
Number of Dairy farmers covered under awareness	1800	1800	1600	89
Setting up of Model Dairy Farms cum micro learning centers	4	4	3	75
Exposure visit of farmers to MDF	200	200	144	72

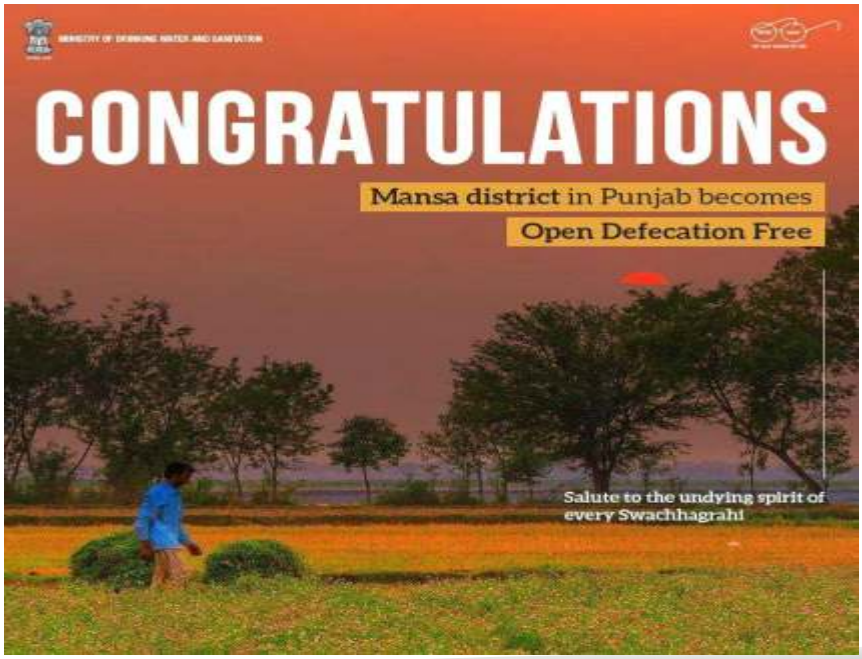
Outcome	Baseline	Annual Targets	Target number YTD Mar'19	Ach. YTD Mar'19	% Ach YTD
% MAH linked to Ruhaanii MPC	9	12	799	583	72
% increment in consistent Pouring Members	53	60	534	454	85
Increment in Milk Poured (KgPD)	7508	15890	15890	12618	79

Plans for 2019-20 :

1. Capacity building of dairy farmers in villages in Budhlada block of Mansa and Sirsa and Fatehabbad districts
2. Training of farmers at Mini Dairy-cum-Learning Centers

WATSAN project in Mansa

- To support Govt. of Punjab on Water and Sanitation project, RGR Cell partnered with Govt of Punjab under Tata Water Mission project and Swachh Bharat Mission (G) of Govt of India. Following activities were carried out:-
- RGR Cell is supporting SBM(G) in 80 villages of District Mansa (PB) with the support of Himmotthan Society (Uttarakhand) and Tata Trusts.
- Survey completed in **80** Villages.
- Total number of IHHL to be constructed- **4956**
- Mansa district was declared 100 percent Open Defecation Free (ODF)



Part II:- RGR (Tamil Nadu)

KEY FOCUS: INTEGRATED LIVELIHOOD INTERVENTIONS AND EXPANSION OF IT SERVICES

RGR Cell, Tamil Nadu has been the alpha organisation in introducing the IPM Package of Practices in Perambalur district and has been successful in maintaining its sustenance in the PoP adoption for the past 5 years of the project intervention. With the learnings in the previous seasons, it was decided that to shift the intervention focus to enterprise model promoting farmer entrepreneurship vide the established farmer producer groups. In addition, RGR Cell, has also collaborated with Tamil Nadu Agricultural University (strategy partner) to support the project farmers with high yielding new varieties of pulses and onion.

KEY HIGHLIGHTS OF THE SEASON:

- Net profit realized by IPM-Cotton farmers was Rs. 4,500-5,000/acre as compared to Rs. 3000-3500/acre achieved by Non-IPM farmers.
- IPM farmers received an additional 0.5-1 quintal of cotton yield as compared to non-IPM farmers.
- IPM farmers saved approximately Rs. 800-1000/acre through applying only recommended dosages of fertilizers as compared to non-IPM farmers.
- Non-IPM farmers on an average carried out 5 -7sprays as compared to 3-4 sprays by IPM beneficiaries.
- The registered Chinnaru Farmer Producer Company (CFPC) has had a net turn-over of Rs. 13.25 lakhs in the 2018-19 Financial Year. During the cotton season, CFPC sold 1000 plus packets of maize and cotton seeds (varieties of regional demand) at Rs. 10-15 less than the local input vendors.
- The business of the FPC has significantly increased from the last financial year (2017-18) thus creating a considerable market share for the company in the district. By way of this, the brands like a syngenta has assured the company to increase the credit limit during the next season.

BEST PRACTICES:

Farmer Producer Company :

1. As a first step to encourage farmer entrepreneurship in the project villages, a Farmer Producer Company (registered as Chinnaru Farmer Producer Company (CFPC) Limited) has been set up with 320 member farmers who are now the primary contact farmers in the project villages.
2. Weekly farmer group meetings organized on specific themes to increase awareness on IPM Package of Practices, Azolla, Nutrition Garden and marketing the cotton yield. During prime cotton season, the group members were trained on potential pests and diseases and their management methods. By doing so, severe outbreak of major diseases was curbed as this season had a fall armyworm which was found to be predominant in maize crop. However, this was addressed through dissemination of appropriate technology through SMS and IVR calls from the mKRISHI portal. Also, farmer group leaders educated the village farmers to have a constant check on the pest and spray recommended dosage of pesticide (corogen @6ml/tank) and to make use of timely mKRISHI sms services.
3. Collaboration with local input vendors and big market players like Syngenta has ensured that the Producer Group members and Farmers in Producer Group villages get the inputs at a margin of Rs. 10- 15 lesser than the actual market price.

Integration of IT in agriculture:

The mKRISHI IT service this season has not only disseminated appropriate timely technology to the project farmers but also facilitated the Farmer Producer Company in advertising the Tamil Nadu Agriculturual University recommended inputs for Perambalur district. The extension services provided included: 1. Promotion of toll free number for immediate query redressal; 2. SMS alerts on individual villages based on the date of sowings; 3. IVR calls; and 4. Dedicated mKRISHI mobile applications (Farmer and Agent applications) with enhanced features. Timely advisory on maize, cotton and onion PoP has been issued vide the mKRISHI platform during the peak pest season. In addition, village-specific alerts were sent after taking feedback from the contact farmers and farmer group leaders. Last season, grey mildew was found to be the major disease in cotton and as per IPM Package of Practices, Tebuconazole has been recommended @ 2.5ml/litre. The alert on Greymildew and Foliar spray has been issued 4 times each during October – December 2017.

Cost of Cultivation and Net Profit: The mKRISHI platform for timely advisory service dissemination has resulted in farmers becoming prudent in adopting the correct Package of Practices. In addition, farmers have contacted the respective village's farmer group members/leaders for information concerning fertilizer/pesticide availability. In 2018-19, the cost of cultivation for IPM farmers was comparatively lesser than the non-IPM farmers who realized a net profit of Rs. 4,500 – Rs. 5,000 against the non-IPM farmers who earned only Rs. 3,000 – Rs. 3,500. Number of carried by IPM farmers have also decreased compared to that by non-IPM farmers. While the non-IPM farmers had 5 sprays, IPM farmers did only 4 thus resulting in a saving of Rs. 3,500– Rs. 4, 000.in the spray cost.

Significance of Foliar Spray: Foliar fertilization has been designed to meet a plant's specific needs for more micro and macro nutrients. More recently established, however, is the fact that foliar fertilization also stimulates the plant roots to become more efficient in the uptake of all vital nutrient requirements. As compared to the commonly adopted 19:19:19 in the region, 13:00:45 is found to have reached the last mile in the project area owing to intensive extension work by RGR Cell, Tamil Nadu vide deployment of Farmer Producer Groups; wall paintings; PoP trainings to lead farmers; and ICT. This extensive outreach by RGR Cell, Tamil Nadu was even recognized by the Joint Directorate of Agriculture and the office has been supportive in identifying the pockets of villages for technology dissemination. Weekly alerts in peak flowering season were disseminated through mKRISHI – mobile advisory, explaining the benefits and the need for spraying 13:00:45 at the correct intervals. On the input side, RGR Cell ensured sufficient availability of 13:00:45 in the market to enable implementation of mobile advisory provided. The Toll Free service has now reached 45,000 farmers in the district and immediate redressal of farmer queries provided

by the lead farmers in the Farmer Producer Groups.

Azolla and Nutrition Garden: In continuance to the nutrition interventions undertaken in the previous seasons the farmers this season, showed interest to adopt the Azolla cultivation. The Field Officer and Agri Business Manager ensured that the significance of Azolla as a cost effective livestock and nutritional benefits of backyard kitchen gardening are discussed in all the weekly farmer group meetings. Also , the group leaders are advised to guide the interested farmers in their respective village of the relevant schemes available for Azolla trays and for Nutrition Gardening. Periodical village level trainings were also conducted by the Field Officer for generating awareness on the Azolla Cultivation. Currently, without the financial support from the RGR Cell, the Perambalur district has over 150+ Azolla pits cultivating year-round cost effective livestock feed.

Disaster Relief Activities : The Regional Center of RGR Cell has undertaken relief activities in the aftermath of Gaja Cyclone. The detail of the activities have been given in Annexure-II.

Mr. Arul Pathinathan, Project Manager - Agri Business, coordinating the baselein data collection activity for a Skills intervention in Kolapadi, Panchayat, Perambalur (LEFT) and Mr. Somanraj Sekar, Area Manager educating the farmers on the mKRISHI SMS and IVR services and the seed varieties available in CHPC for the season (RIGHT)

Acknowledgements

The RGR Cell is very thankful to Tata Trusts for funding support for “Reviving Green Revolution” initiative for promoting agriculture diversification in Punjab and Tamil Nadu and support activities to tribal, small and marginal farming communities which have been kept outside the realm of modern agricultural technologies. Funds received from Govt of Punjab and WWF- India are gratefully acknowledged.

Annexure-I

Project Blocks (Punjab)

Cotton-Wheat Cropping System/BCI project	
District	**Blocks**
Bathinda	Mour; Bathinda; Nathana; BhagtaBhaike; Sangat; Rampura
Faridkot	Kotkpura
Fazilka	Abohar; Khuian Sarvar; Arniwala; Fazilka
Mansa	Jhunir; Mansa; Bhikhi; Budhladha
Sangrur	Sunam; Lehergagha
Shri Muktsar Sahib	Shri Muktsar Sahib; Malout; Giddrebaha
Basmati Based Cropping System project	
Amritsar	Chogawan; Tarsikka; Harsha Chhina; Majitha; Attari; Verka; Ajnala
Gurdaspur	Gurdaspur; Dinanagar; Fatehgarhchurian; Dera Baba Nanak; Dhariwal; Kalanaur
Tarn Taran	Tarn Taran; Gandiwind; Chohla Sahib; Patti; Valtoha; Bhikhiwind

Project Blocks (Tamil Nadu)

Integrated Livelihood Interventions and Expansion of IT services	
District	**Blocks**
Perambalur	Veppur
	Veppanthattai
	Alathur
	Perambalur

ANNEXURE - II

Tamil Nadu - Gaja cyclone Relief

RO Treated Drinking Water Distribution

S. No	District	Block	Villages/urban localities	Date of relief activities	Relief activities (Specify items)	Unit	No of Units
1	Nagapattinam	Thirukuvalai	• Ettukudi	25th November -5th December	RO treated drinking water	Litres	10,000
2	Thiruvaraur	Mannarkudi	• Irulneeki	25th November -5th December	RO treated drinking water	Litres	19500
3	Tanjore	Orathanadu	• Poyyundarkudikadu • Uppundapatti • Paatchur • Marugulam • Karamanithoppu • Regunathapuram • Thopur	25th November -5th December	RO treated drinking water	Litres	31000
4	Pudukottai	Karambakudi	• Kaduvettividuthi • Kuzhathayanpattu • Nadupatti • Xavierkudikadu • Nachiyarpatti • Nerkuppai • Manjapatti	25th November -5th December	RO treated drinking water	Litres	27000

Relief Material Distribution

S. No	District	Block	Villages/urban localities	Date of relief activities	Relief activities (Specify items)	Unit	No of Units
1	Nagapattinam	Thirukuvalai	• Ettukudi • Agaram	25th November - 5th December	Solar Lanterns	Units	243
2	Thiruvaraur	Thiruthuraipoondi	• Kilaperumalai • Vadasankanthi • Aariyalur	25th November - 5th December	Solar Lanterns	Units	158
3	Tanjore	Ortahanadu Madukkur	• Poyyundarkudikadu • Mandalakottai • Karuppur • Alangadu	25th November - 5th December	Solar Lanterns	Kit per family	599
4	Tanjore	Ortahanadu	• Poyyundarkudikadu	25th November - 5th December	Grocery kits (Food Material and hygiene items)	Kit per family	328

FINANCIAL HIGHLIGHTS 2018-19

BALANCE SHEET AS AT MARCH 31, 2019

Particulars	As at March 31, 2019 (In Rupees)	As at March 31, 2018 (In Rupees)
FUNDS AND LIABILITIES		
FUNDS		
(a) Earmarked Funds	1,44,00,865	1,12,71,881
(b) Fixed Assets Fund	8,47,408	11,12,382
(c) Income and Expenditure Account	40,548	29,389
	1,52,88,821	**1,24,13,652**
LIABILITIES		
Current Liabilities	1,24,870	46,638
		46,638
TOTAL	**1,54,13,691**	**1,24,60,290**
ASSETS		
(a) Fixed assets	8,47,408	11,12,382
(b) Loans and advances	2,26,285	1,98,264
(c) Cash and bank balances	1,43,39,998	1,11,49,644
TOTAL	**1,54,13691**	**1,24,60,290**

INCOME & EXPENDITURE ACCOUNT FOR THE YEAR ENDED MARCH 31, 2019

Particulars	For the year ended March 31, 2019 (In Rupees)	For the year ended March 31, 2018 (In Rupees)
Income		
Transfer from Earmarked funds	3,43,49,882	3,54,93,147
Transfer from Fixed Assets fund	3,20,974	2,27,974
Other income	11,159	2,612
Total Income	**3,46,82,015**	**3,57,23,733**
Expenses		
Expenditure on objects of the Society		
(i) Grant paid	16,27,241	4,75,000
(ii) Project expenses	3,15,47,771	3,13,90,762
(iii) Establishment expenses	34,48,925	36,20,967
(iv) Depreciation and amortization expense	1,78,398	2,27,974
Total expenses	**3,68,02,335**	**3,57,14,703**
Excess of Income over Expenditure	**11,159**	**9,030**

EARMARKED FUNDS		
Particulars	**As at March 31, 2019 (In Rupees)**	**As at March 31, 2018 (In Rupees)**
Balance at beginning of the year	1,12,71,881	1,98,09,720
Add: Received during the year	3,71,13,092	2,64,61,355
Add: Interest Income received during the year	4,31,784	9,10,617
Less: Transferred to Income and Expenditure Account	(3,43,49,882)	(3,54,93,147)
Less: Transferred to Fixed Assets fund	(56,000)	(4,16,183)
Less: Refunded during the year	(10,010)	(481)
Add: Amount refunded by onward grantee/other transfer	-	-
	1,44,00,865	**1,12,71,881**

FIXED ASSETS CAPITAL FUND		
Particulars	**As at March 31, 2019 (In Rupees)**	**As at March 31, 2018 (In Rupees)**
Balance at beginning of the year	11,12,382	8,96,473
Add: Transferred from Earmarked Funds	56,000	2,06,098
Less: Utilised during the year	(3,20,974)	(1,78,398)
	8,47,408	**9,24,173**

INCOME AND EXPENDITURE ACCOUNT		
Particulars	**As at March 31, 2019 (In Rupees)**	**As at March 31, 2018 (In Rupees)**
Balance at beginning of the year	29,389	18,694
Add: Excess of Income over Expenditure	11,159	1,665
	40,548	**20,359**

Reviving Green Revolution Cell is registered under :

Society Registration No.	:	**680 of 2007-08**
Foreign Contribution Regulation Act (FCRA) No.	:	**115300042**
Registration u/s 12AA (1)(b)(i) of the Income Tax,1961	:	**CIT-III/JB/12A/242/10-11/694**
Exemption u/s 10(23C)(iv) of the IT Act, 1961	:	**CCIT/LDH/JB/10(23C)(IV)/145/2009-10/2821**
Permanent Account Number	:	**AAAAR6284L**
Tax Deduction Account Number	:	**JLDR03215C**

OUR BANKER

State Bank of India, Punjab Agricultural University Branch, Ludhiana

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INTERNAL AUDITOR

M/s PKF Sridhar & Santanam LLP, Mumbai

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An Initiative of **TATA TRUSTS**

REVIVING GREEN REVOLUTION CELL

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