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30th April 2021

To
Tata Chemicals Society for Rural Development
Dwarka,
Gujarat

Kind Attention: Ms. Alka Talwar, Chief - CSR and Sustainability

Dear Ms Alka Talwar,

We are pleased to attach the brief impact report for your project at Babrala, Sambhal District, Uttar Pradesh based on the study conducted by Change Alliance Private Limited recently.

It would be pertinent to also add that we are in the process of finalising our detailed report on Babrala model – Pathways for Scaling Up and Replication – which we hope to also submit shortly.

Thank you.

Yours sincerely,
For Change Alliance Private Limited

DocuSigned by:
PV Narayanan
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P V Narayanan
Director-Development Advisory and Operations

Encl: Brief Impact Report of Babrala project implemented by TCSRD

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TCSRD

TATA CHEMICALS SOCIETY FOR RURAL DEVELOPMENT

Babrala Agriculture and Livestock Project

Impact Report Card 2021

Prepared and submitted by:

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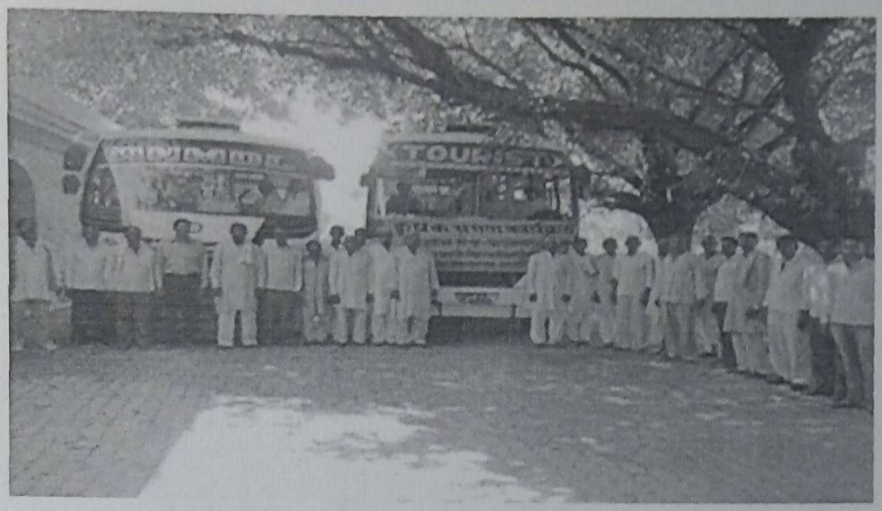
BACKGROUND



Tata Chemicals Society for Rural Development (TCSRD), the CSR arm of Tata Chemicals, had undertaken an intensive agriculture and livestock development programme for the community in the neighbourhoods of Babrala fertilizer plant since 1993. The programmes have continued till the transition of the business from Tata Chemicals Ltd to Yara Fertilisers India Pvt. Ltd. in January 2018 and are still active as part of Yara's CSR initiatives.

Impactful programmes were implemented by TCSRD focused on:

- ***Land Development, Regeneration and Farmers Awareness*** (land reclamation, laser leveling, deep ploughing, organic promotion and soil testing), capacity building of farmers (training programme, Kisan Mela, exposure visits and linkages with government schemes)
- ***Introduction of New Technologies*** (SRI- System of Rice Intensification and SWI - System of Wheat Intensification, seed multiplication)
- ***Farm Mechanization*** (seed storage bins, bullock harrow, bullock and tractor seed drills, sub soilers and spray machines)
- ***Diversification of Cash Crops*** (mustard, maize, pulses and vegetables seeds and Mentha roots)
- ***Livestock Management*** (animal health care and Vaccination, breed improvement and balanced nutrition.

For the farmers of 300 villages in and around Babrala plant of Tata Chemicals, TCSRD's interventions have had a transformative effect.

In a recently concluded independent third-part impact evaluation of TCSRD's project by Change Alliance Private Limited, **90% of the population surveyed expressed satisfaction with TCSRD's interventions, while 70% reported that their incomes had improved due to the support of TCSRD.**

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Agriculture

1. Land Reclamation
Bunding of Plots, Disc Ploughing, Land Levelling, Gypsum Application. Leaching, Dhaincha Turning & Paddy Transplantation.

2. Soil Health & Water Conservation
Laser Levelling, Deep Ploughing, Soil Testing & Organic Promotion

3. Farmers Capacity Building
Farmers Training, Kisan Mela, Exposure Visit & Farmers Linkage with Government Schemes.

4. Farm Mechanisation
Distribution of Bullock Harrow and Seed Drills, Tractor Seed Drills, Seed Storage Bins, Sub Soilers and Spray Machines.

5. Promotion of New Technology & Seed Multiplication
SRI – System of Rice Intensification, SWI – System of Wheat Intensification Paddy and Wheat Seed Multiplication

6. Diversification of Cash Crops
Mustard , Hybrid Maize, Pulses & Vegetables Seeds Distribution , Mentha Roots & Vegetables Saplings Distribution

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1 Land reclamation

In the relatively low productive agriculture lands of Babrala, TCSRD has successfully renewed the otherwise low yield Usar land, largely alkali soils, to highly fertile lands through improvement in its physical conditions and productivity status through land reclamation initiative.

- Initiated in 1994 and continued up to 2012, the aim of land reclamation on making the Usar land productive and arable. TCSRD's interventions improved the paddy and wheat yields by five times.
- It covered an area of 1876.55 acres, benefitting 1415 farmers directly
- The intervention overall benefitted a population of 9905 people in 70 villages
- The intervention successfully transformed a low productive land into high productive farms leading to employment generation, local high-quality fodder availability and sustainable income for farmers.

Phases of interventions	Acres covered	Villages covered	Farmers benefitted	Communities reached
I (1994-96)	438	2	146	1022
II (1994-2012)	359.40	11	428	2996
III (2001-2012)	277.90	23	255	1785
IV (2008-2012)	801.25	34	586	4102
Total	**1876.55**	**70**	**1415**	**9905**

2 Soil health and water conservation

Soil and water are two important natural resources and the basic needs for agricultural production. Given the significance of mitigating soil erosion and the glaring reality of water scarcity, TCSRD gave added impetus to the aspects of soil health and water conservation.

- ***Laser levelling and deep ploughing***: 1351 acres of land and 883 farmers were benefitting during 2016-19
- ***Soil testing***: 671 farmers submitted soil samples and paid Rs 50 per sample with a total contribution Rs 33,550 for 912 acres of land during 2016-19. This helped them test efficiency of nutrients and water use and helped improve their agricultural productivity
- ***Promoting organic manure for farming:*** TCSRD provisioned three products – Bhujeevan, Bhumika and Geo Green, and extending training to farmers to create their own organic manure through composting during 2016-2019, covering an area of 773.5 acres. This increased nutrients level in soil led to better yield. **636 farmers applied the organic manure products and were trained in composting.**
- ***Farm-entrepreneurs:*** TCSRD created entrepreneurs amongst farmers who were encouraged and supported to buy farm equipment for laser levelling and deep ploughing. These entrepreneurs, in turn, loaned the equipment to other farmers, in the process helping to improve productivity of farmers, and in earning additional income from this business. Some farmers, with their income, also bought equipment like 4-wheel and 6-wheel trolleys from their income.

Impact study has shown that farmers highly valued the support from TCSRD with recognition of laser Levelling (80.8%), Deep Ploughing (38.5%), using Organic fertilizer (46.2%) and soil testing (51.3%) as critical interventions for increasing soil productivity.

3 Farmers Capacity Building

With the motto of 'teach a man how to fish' instead of 'giving him a fish', TCSRD worked on a model of sustainability making the farmers independent in order to carry out their agricultural practices successfully equipping them with learning and exposure to technology, agricultural practices and schemes.

- **Training of farmers:** TCSRD provided training both through its own in-house team at Babrala and through experts from agricultural institutions and Krishi Vigyan Kendra to 1740 farmers during 2017-19 on improved agriculture practices, land and water management practices, crop diversification, use of modern agriculture tools, etc.
- **Kisan mela:** Kisan Mela meets were organised in collaboration with GB Pant University, Pantnagar and Sardar Patel Agriculture University, Meerut. Not only it helped build confidence in the farmers to experiment and adopt new practices, it also exposed them to latest technologies and seeds. 776 beneficiaries were enrolled in these field trips and gained exposure to modern practices and technologies.
- **Farm Exposure visits:** Exposure visits helped 206 farmers get a first-hand understanding of best practices. Organised during 2017-19, the purpose of TCSRD's efforts in this area included exposing the farmers on best practices as well as promoting practical exchange of information between the farmers. This had a positive impact especially on the promotion of cash crops and vegetables such as Mentha, mustard, maize, Parwal, cabbage and tomato.
- **Information desk on government schemes:** TCSRD facilitated access to information in accessing various central and state government schemes and subsidies on seeds, micronutrients, insecticides, pesticides, herbicides and agriculture equipment. 259 farmers were able to access subsidy for 2518 kilogrammes of wheat seeds and 68 famers availed subsidy of 3450 kilogrammes of paddy seeds.

4 Promotion of New Technology and Seed Multiplication

Farmers were trained on new techniques focused on water conservation and increase in yields. The initiative had positive impact on both environment and farm productivity.

- ***System of Rice Intensification (SRI):*** SRI for rice cultivation requires less water, less expenditure and gives more yields. It is beneficial for small and marginal farmers and uses less seeds. During 2017-19, 202 farmers from 28 villages adopted SRI on 114.7 acres land, reducing water use by 15-25% and increased paddy production by 40%.
- ***System of wheat Intensification (SWI):*** Deployed line method for sowing the seedlings, followed by gap filling and irrigation. During 2015 to 2019, 2049 farmers applied SWI method on 3793 acres of land across 32 villages. This resulted in increased productivity by 40% and water saving of 15%-20%.
- **Seed Multiplication**: Farmers traditionally used grains stored at their home as seeds for the next season which led to reduced crop productivity. TCSRD introduced farmers to the process of harnessing seeds and storing them for future.

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local, climate-appropriate, good quality hybrid breeder seeds. Seed multiplication was done in consultation with agriculture scientists, seed production institutions and seed certified agencies. 424 farmers benefitted and a yield of more than 9000 quintals was produced in 601 acres.

Seed Multiplication	No. of Farmers	Area Acers	Seeds Qty. (Kgs)	Production in (Qtls.)
Paddy Seed Distribution (2015 to 2019)	264	420.8	2162.5	**7022.9**
Wheat Seed Distribution (2015 to 2019)	160	180.7	9030	**3390.5**

5 Farm Mechanisation

Mechanisation in agriculture has revolutionized farming. It raises the efficiency of labour and enhances the farm production. Realising its strengths, TCSRD helped farmers with access to latest and apt technologies.

- During 2016-19, 174 seed storage bins, 15 sub soilers and 24 seed cum fertiliser drills were taken up by farmers to increase their yield and enter the commercial line of agriculture. These were purchased by farmers with co-sponsorship of funds from TCSRD. This provided additional income to the farmers and reduced farm drudgery.
- Some of the technologies were also used to generate income which became a sustainable model for income generation among farmers.

6 Diversification of cash crops

Diversification helps in increasing the output and income for farmers. Farmers were encouraged to switch from their traditional cereal crops of paddy, bajra, maize, and wheat.

- Diversification of cash crops helped farmers who were already into multi-cropping and were farming throughout the year.
- Diversification to vegetables and cash crops such as mustard, hybrid maize, pulses, vegetables seeds, Mentha roots and vegetables saplings was aimed at increasing food security, maximising income sources from an average acre of land and increasing soil fertility through crop rotation and mulching.
- In the year 2018-19 alone, 559 farmers were provided with seeds and saplings which were used on 500 acres of land.

Diversification of Cash Crops					
S. No.	**Name of Programme**	**Unit of Measurement**	**2016-17**	**2017-18**	**2018-19**
1	**Mustard Seed Distribution**	Area Acres	204.40	234.00	240.00

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Diversification of Cash Crops					
S. No.	Name of Programme	Unit of Measurement	2016-17	2017-18	2018-19
2	Pules Seed Distribution	Area Acres	81.40	98.20	76.00
3	Vegetables Seed & Sapling Distribution	Area Acres	58.80	52.80	46.00
4	Hybrid Maize Seed Distribution	Area Acres	165.30	102.00	26.00
5	Mentha Roots & Saplings Distribution	Area Acres	38.00	52.00	74.50

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Livestock Development

1. Health Care & Vaccination

HS Vaccination, FMD Vaccination, Animals Health Camps, PPM Training, Animal OPD & Deworming Camps.

2. Breed Improvement

Natural Breeding of Buffaloes, Extension of Murrah Buffaloes, Extension of Cross Breed Cows, Artificial Insemination.

3. Balance Nutrition

Distribution of Barseem, Sorghum , Oats & Makkhan Grass Seeds & Napier Grass Sets.

4. Market Linkages

Opening of Milk Collection Centres & Exposure visit of small Dairy Units

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1. Health Care and Vaccination

Poor livestock health resulting from diseases causes considerable economic losses to predominantly poor dairy farmers as they are often unaware or unable to access services for preserving health of their cattle. TCSRD, under its livestock development programme at Babrala, embarked on a disease prevention and control strategy through healthcare and vaccination with the cattle of dairy farmers.

- Vaccination for Foot and Mouth Disease (FMD) and Haemorrhagic Septicaemia (HS) were undertaken with support of government veterinary doctors.
- Started with 4 villages, the project was expanded to more than 50 villages and almost 60,000 cattle received medical care and vaccination every year. Farmers paid for the vaccination, which is a very positive sign of its value.
- Animal Health camps were organised in remote clusters of villages. TCSRD arranged 4-5 outpatient department (OPD) camps taking support from government vetinary officers and para-veterinary workers (Pashu-Palak Mitra or PPM) trained by TCSRD.
- Pashu Palak Mitra (PPM) programme became the backbone of livestock intervention. This has created a skilled cadre of PPM in the target areas of TCSRD's interventions. A fully equipped para-veterinary service is always a call away with the training and support provided by TCSRD at charges which have been set between TCSRD and farmers. .
- In the year 2018-19 alone. 1454 animals were examined and treated in 141 villages benefitting 1254 cattle owners. In the coverage area of PPM, 83% of people have cattle in their homes, and the large majority among them have accessed animal health care services of TCSRD.

S. No.	Name of Activities	*No. of Animals*	*No. of Cattle Owners*	*No. of Villages*
1	HS Vaccination	*106135*	*18570*	*50*
2	FMD Vaccination	*80637*	*12749*	*26*
3	Animal – OPD	*15636*	*14365*	*92*
4	Animal Health Camps	*5152*	*4264*	*92*
5	Deworming of Milch Animals	*5311*	*4615*	*16*
6	Deworming of Calves	*5390*	*4604*	*16*
7	Pashu Palak Mitra Training	*46*	*46*	*46*

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2. Breed Improvement

Genetic make-up of dairy animals control their abilities to produce milk. Milk production, therefore, is largely affected by a combination use of improved breeds for milk production, a favourable nutritional environment and good practices in managing the cattle.

- The breed improvement of TCSRD was focused on natural breeding of buffaloes, extension of Murrah buffaloes, extension of cross breed cows and artificial insemination (AI). Milk production increased, and so did the quality leading to higher revenue at household level.
- Impact study showed that 65% of the people interviewed shared that the production had led to higher sale and consumption, while 90% of the cattle owners rated Pashu Palak Mitra's (PPM) Service as timely and highly effective. Conception rate with AI has been as high as 60% while PPM could do up to five AIs in a day.

S. No.	Name of Activities	*No. of Animals*	*No. of Cattle Owners*	*No. of Villages*
1	Natural Breeding by Murrah Bulls	**38**	**38**	**32**
2	Extension of Murrah Buffaloes	**219**	**219**	**17**
3	Extension of Cross Breed Cows	**19**	**19**	**6**
4	Artificial Insemination	**104065**	**93875**	**446**

3. Balanced Nutrition

When it comes to health of cattle, it is well documented that in addition to shortage of feed, imbalanced nutrition is a major factor responsible for low livestock productivity. Balanced nutrition contributes to improving animal output as well as to reducing both the cost of production and the emission of greenhouse gases (GHG) per unit of animal product.

- TCSRD focused on introduction of multi-cut variety of green fodder in order to provide improved nutrition to dairy animals which replaced the dried stalks of wheat, paddy, maize and other crops which were in use.
- In terms of adoption of green fodder, the impact study shows that 55% of respondents used Berseem seeds, 33% used oats seeds, 19% used Makkhan grass while 65% shared that they used multi-cut saplings. This has led to a milk production of 3.5 litres in the morning as well as in the evening, that is, a total of 7 litres per buffalo with high fat and solids-not-fat (SNF), fetching Rs 38-40 per litre. This increase in immediate income has further motivated the farmers to invest in multi-cut green fodder.
- 78% of cattle owners surveyed during impact study credited the intervention for providing good health to their livestock.

S. No.	Name of Activities	*No. of Cattle Owners*	*No. of Villages*
1	Barseem Seed Distribution	1429	11
2	Sorghum Seed Distribution	415	11
3	Oat Seed Distribution	183	8
4	Makkhan Grass Seed Distribution	56	8

4. Market Linkages

Farm to market linkages is a critical chain in value addition for farmers. It is even more important in case of a highly perishable good like dairy farming which depend on timely and efficient collection of milk. Milk Collection Centres give farmers the opportunity to sell their milk at the right price, create demand and also bring efficiencies in production.

- In order to address the supply chain side of increase in incomes from sale of milk, TCSRD facilitated opening of Milk Collection Centres and exposure visit to small dairy units. The linkages included UP Parag Cooperative Dairy, Mother Dairy and private dairies.
- Due to the high quality of breeds, good quality milk and veterinary services at the doorstep, many private dairies have their presence in this cluster. As many as 55 collection centres in 11 villages led to a robust demand for milk. This gave the farmers options depending upon the rate and various services that each dairy provides to the cattle owner enabling the farmers to get the best price for their supply.
- Farmers were given advances against purchase of milk by private dairies of Rs. 10,000-Rs. 15,000 which were adjusted during the settlement of payment.

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