

Strengthening grassroots for self-sustenance

Anil Verma

Preservation and Proliferation of Rural Resources and Nature

Anil Verma sounded intense when he told me, “In a programme, you talked about the need to focus on important tasks and not on those that are merely interesting or professionally challenging. That is exactly what I am trying to do through PRAN. Serving the poor and oppressed communities here is important to me.” As the founder of Preservation and Proliferation of Rural Resources and Nature (PRAN), Anil wants the organisation to be big on impact than on size or financial worth.

From a scientist to a development professional

Anil Verma joined Indian Council of Agricultural Research (ICAR) as a scientist after completing his postgraduation in agronomy from Dr Rajendra Prasad Central Agricultural University in Pusa of Bihar, popularly known as Pusa University.

He soon found that his ardour to contribute to the development sector exceeded his scientific bent of mind. A year later, he quit his job in ICAR, foregoing the perks of a government job and joined Professional Assistance for Development Action (PRADAN), an NGO, as an executive.

Genesis of PRAN

Anil cut his teeth in development work in Jharkhand. When he was posted as a team leader for PRADAN’s project in Siddhi district of Madhya Pradesh, he was happy since he would be working among the community and stay close to three of his siblings living in nearby Korba.

In 2005, Bihar government’s State Rural Livelihood Mission (SRLM) assigned PRADAN a special project to popularise System of Rice Intensification (SRI) method among 200 farmers in Gaya district at a cost of Rs 8 lakhs. When Deep Joshi, one of the founders of PRADAN,

suggested that Anil take up the work, he moved to Gaya reluctantly. Little did he realise that it would be a turning point in his career in the development sector.

The first year he could get only 128 families to practise SRI. As SRLM – popularly known as Jeevika – is a programme implemented by Bihar Rural Livelihood Promotions Society (BRLPS), the latter allocated Rs 60 lakh the next year. As against the target of 2,000, Anil got 5,146 farmers to practise SRI farming. Subsequently it was scaled up with the support of Tata Trusts.

It was during this project that Anil observed the appalling living conditions of the Mahadalits, as the marginalised among the Scheduled Caste people are referred to in Bihar. He wanted to work towards their upliftment. By then Anil had become an ardent believer and passionate evangelist of SRI and wanted to reach out to more farmers. PRADAN felt his approach sectoral. He was in a dilemma, wondering whether to continue with a secure career in PRADAN or to work on his own in Gaya, based on PRADAN's ambiguous promise of support. He chose the latter as he was intensely committed by then, to work for the people in Gaya district.

He established PRAN, short for Preservation and Proliferation of Rural Resources and Nature, as a public charitable trust in November 2012, at Gaya.

Gaya – Anil's karmabhumi

The undulating terrain of Gaya district in central Bihar, extends from the border of Jharkhand up to Gaya town and merges with the alluvial plains further north towards Patna. Numerous rivers originating in Jharkhand flow towards the Ganga during monsoons, often causing floods and waterlogging in riparian regions. But the terrain wears a parched look during summer.

It comes under the rain shadow of the Santhal Pargana plateau and gets an average annual rainfall of about 990mm, less than in many parts of the rain-rich eastern region. "Much of the district lands are not really optimal for growing paddy. Since rice and gruel are the staple diets that can sustain the people even when they do not have anything to go with it;

paddy is the most popular crop here,” said Anil. Mustard and horse gram are also grown on retained moisture and wheat is grown if water is available for irrigation.

Tourism is the most important non-farm economic activity since Gaya is a pilgrimage centre for Hindus, Jains and Buddhists. Hindus perform rites for their ancestors on River Falgu; Jains and Buddhists visit Bodhgaya, the place where Buddha attained enlightenment.

The district has a population density of 880 persons per square kilometre and a male-to-female sex ratio of 932. The district is socially and economically backward. Scheduled Castes, Muslims and other backward castes (OBC) form the majority of the district population. Most of the Muslims and a significant proportion of the Mahadalits are landless. Even the Mahadalits who own land make a living as labourers since they own less than an acre.

A lot of sharecropping – where a tenant farmer uses the land and gives a share of the crops to the landlord – is practised here since the landlords have moved to urban areas. Despite the absence of forests and hills, the district has long been affected by left wing extremism (LWE). Feudalism dating back from the Permanent Settlement enacted during British rule and its intense aftermath have led to oppression and exploitation of all the marginalised people. PRAN has set out to uplift the oppressed and the marginalised in this locality.

PRAN’s farminterventions

(i) Promotion of system of root intensification in various crops

Anil said that he looked at system of root intensification (SRI) as a set of principles. The most important principle is to allow the roots to have enough space to express themselves and to grow to their full potential. This requires spacing between plants and between rows.

The second is to exploit the potential offered by phyllochron, or the time interval between the appearance of successive leaves of a crop. With the spacing between plants and rows at 25cm, an acre, which equals 4,000sqm, can hold 64,000 paddy plants. As the typical weight per 1,000 paddy grains is 28gm, only 1.9kg of seeds is required for an acre. With a four-day phyllochron, the number of tillers or new shoots genetically possible in the 60 days of

vegetative growth (the photosynthesising growth phase before the plant starts flowering) is very large. “With optimal micro-environment, the yield potential of paddy is very large. Hence it’s not surprising that a yield of 19.10 tonne per hectare was recorded,” said Anil.

The principles of spacing to provide optimal space for roots to grow and utilising phyllochron are common across all crops. That is how whether seeds were scattered through broadcast method or seedlings were transferred through dense planting method, SRI has shown substantial, even dramatic yield improvement. This has been done particularly for crops that can be grown using transplantation process. Till now PRAN has applied SRI principles on a significant scale, with great success, to wheat, mustard, sugarcane and several vegetables.

(ii) Promotion of sustainable agricultural practices

Anil’s efforts have been in promoting an optimal environment for each crop, so as to maximise the yield for farmers. This led Anil to dissemination of sustainable agricultural practices.

SRI gives adequate space for roots. Direct seeding or early transplantation exploits phyllochron to its maximum under the ambient conditions. The plants draw required nutrients from the soil. The soil can get nutrients either from humus or from external chemical inputs. In general roots convert 15% to 35% of the chemicals into nutrients for the plants. The unused balance leaches into the soil and contaminates groundwater. This is a vicious cycle and the adverse effects are seen wherever chemical inputs are high.

Microbes needed to convert chemical fertilisers into plant nutrients get destroyed over a period of time. Without the microbes, the percentage of chemical fertilisers converted into nutrients gradually decreases. So microbes need to be restored.

The best way to restore the microbes is through natural insect and pest management and natural nutrient management. Anil followed the techniques established by Subhash Palekar, an agricultural expert on natural farming. The emphasis of non-pesticide management (NPM) is on using locally available natural resources.

Organic manure has high microbial content. This acts as a culture and the microbes in the soil proliferate. The crops grown organically are very healthy and give better yield.

Households that switch to organic methods are taught to prepare manure, growth regulators, insecticides and pesticides. The pest and insect control agents are called *astra* or weapon and the growth promoters are called *amrit* or nectar. Anil is resolute that farmers should practise sustainable measures in their entirety, namely, seed treatment, natural manures, natural insect and pest management methods such as boundary crops, insect traps of diverse types and bird perches. “When we integrate sustainable methods with the principles of SRI, we get the best results from organically grown crops,” said Anil.

(iii) Development of farm implements

Weeding is an important part of the farming process, especially if the crops are grown through the SRI method. Cono and Mandwa type weeders that were used were not efficient since they had fixed width. As tillers begin to come up and the plants grow, the space between rows shrinks; running a weeder of a fixed width between the rows becomes difficult.

With the help of local ironsmiths Anil developed a weeder with three adjustments – the widest one to be used when the plants are small, the second one when they are about 15 days old and the narrowest when they are a month old or older.

When the system of root intensification process in crops such as wheat and mustard became popular, farmers faced a problem maintaining distance between plants. The method of preparing a 25cm grid as in a paddy field was not possible since the distance between plants was smaller – about 8” (inches) for wheat and 4” for mustard. Anil designed a manual and a mechanical seeding machine. He has also designed and popularised various farm implements including a chopper for cutting sugarcane nodes, to help farmers carry out the farm activities effectively.

Solar-powered irrigation

Irrigation was either by way of *ahar pyne* systems or by using diesel pumps of 8HP capacity. Ahar pyne is a traditional water harvesting system. Pyne is a diversion channel from a river and it ends in a reservoir called ahar. In Gaya district, the ahar pynes were in disrepair. In any case, only those who had lands along a pyne or in the command area could irrigate using the ahar pyne.

Diesel pumps of 8HP capacity are expensive and it is extremely difficult to get a regular supply of diesel. With no power supply in most of the villages, solar pumps offer the best way of irrigating small farms.

PRAN has piloted installation of 5HP solar-powered pumps. “We installed them by enabling a group of 22 marginal farmers take a loan. It cost us Rs 5.5 lakhs including the pipes and electrical connection. The farmers have already started paying instalments. Since the water table is good, we will have enough water to irrigate vegetable crops in rabi season,” said Anil.

The Dalit household on whose land the bore well is sunk gives in writing, in a legally binding form, that neither he nor his heirs will lay claim to it. The 22 members are from the group that practises SRI and have their own plots within 500m of the bore well. PRAN is engaged in installation of eight such schemes. According to Anil, it is better to implement such projects with loans, rather than waiting for support through government schemes.

Land and water management

Anil is well-versed in land and water management, as his work in PRADAN involved the same. PRAN has completed a couple of diversion-based irrigation (DBI) schemes with the help of Tata Trusts.

PRAN has helped the district administration design a land and water management programme using Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) funds. They have educated communities about implementing works as per design.

“When the community finds out that the contractor is not executing the work as per the design, they call us. We go there and make sure that everything is executed as per the design. Only then the community allows the contractors to proceed.”

Training and capacity building

With their remarkable success in promoting SRI as well as NPM among marginal farmers in Gaya’s difficult terrain, PRAN and Anil have come to be regarded as experts. The Bharat Rural Livelihoods Foundation (BRLF) network has been engaging Anil and his team extensively in promoting SRI in the areas where they work.

With similar requests for assistance from states and civil society organisations across India, Anil has developed structured training programmes. However, the training programmes equip only the administrative staff. Village Resource Persons (VRP) who have become adept at practising SRI train those working in the field.

Strengthening societal roots

Anil has evolved a unique style of intervention. His training sessions start with mystical songs. A song which he played to me had verses like

**"Tell me, oh! my friend,
Are you the hand that does things or
Is your hand doing things?
Who speaks my friend?
You or your mouth?"**

These songs are in Magadhi or Hindi and set to popular tunes. They draw a lot from Hindu philosophy. Instructions for agricultural practices that the farmers should adopt are also in the form of songs and women participants sing them during each meeting.

“33,000 crore deities are believed to reside in the cow and that is why it is considered holy. In reality, a large number of beneficial microbes is seen in a cow’s products and by-products. That is why whether religious or not, we prefer cow’s urine, dung and milk in our agronomy for our farm inputs,” explained Anil.

“SRI is all about strengthening roots. We are also living entities. Shouldn’t our roots become strong? We need to make our familial and our social roots very strong. To make our roots strong, we need to understand what causes them to become weak.”

“Conditions around us slowly change when we focus on doing our work well without bothering if others are doing their work or not. There is a slow yet definite change in the way we interact. Disagreements and discords within families, between neighbours and other people disappear. Harmony prevails. We should have faith and continue to do our duty without sacrificing our rights or dignity. People change after observing us,” he said.

Anil advocates paying obeisance to elders. “Children will naturally follow the practice when they see their parents doing so.” According to him such practices will clear misunderstandings, positive vibes will prevail and there will be harmony.

In general he draws upon philosophical and metaphysical beliefs that align with the Hindu way of thinking, but switches metaphors and language while addressing people of different faith. In Chakradharpur area of Jharkhand where he was assigned work while working in PRADAN, there were quite a few villages with a predominant Muslim population. He realised that to be accepted by them and to carry out his work among them, he had to adapt their social habits and practices to be one of them. He started greeting them with an *adab*, instead of a *namaste*. While talking to them, he used the metaphors that they did. His point is simple: strengthen your roots by doing your own duty and building harmony. His principle seems to be working well.

Deepak, a driver who has been working for PRAN, said following Anil’s advice bears fruit. “I started touching my parents’ feet. Gradually the tension within the family reduced. My own situation started improving and almost dramatically, I was able to save money and buy a vehicle with a partial loan,” he said. Karimulla, who has been among the first of Anil’s colleagues also confirmed that such transformation happened in his own life as well.

I teased Karimulla about the animal husbandry composition that changes with ecological and demographic features. There’s a large and relatively unproductive (in terms of milk) cattle population when there is abundant biomass, little mechanisation and absence of milk markets – situations that prevail in the central Indian regions. But in some places of Bihar

and Gujarat, where there is a vibrant dairy market, large-scale mechanisation and lack of biomass in village commons, there are no *desi* or indigenous cattle but a dominance of buffaloes or cross-bred cattle. “Will the entire sustainable agricultural practice fall flat if there were no cows?” I teased.

Karimulla’s response was remarkable. He said “While we extol cows, the same is perhaps true of buffalo and perhaps even of human physiology. While we need to do comparative research about plant protection or nutrient quality based on buffalo urine or the urine of a cross-bred cow, there is no reason to stop organic practices simply because there are no cattle.” To him, the traditional beliefs are not of blind faith, but instruments to extend information that is easily understood and accepted by the communities. And the core remains that of science!

Evolution of PRAN

The name PRAN spells out its objective i.e., the organisation seeks to preserve and proliferate rural resources and nature.

Anil wished PRAN to benefit from the experience and advice of people successful in their own right. The governing board accordingly consists of acclaimed names from the development and other sectors. Dr Ravi Chopra, founder of People’s Science Institute, Dehradun, serves as PRAN’s chairperson.

Anil is the administrative head. VRPs work with the community. Skilled extension workers (SEW) coordinate the works of the resource persons and report to project managers. Executives and subject matter specialists help develop the skills of project managers and report to the administrative head.

As of 2016, PRAN works in 11 administrative blocks in Gaya district and four blocks in Nalanda district respectively, reaching out to about 300 villages. They have formed informal groups of small and marginal farmers interested in following the SRI *vidhi* (processes).

The groups can be quite large and do not follow the standard of keeping the member count under 20, as in self-help groups. In my meetings with these members, I found that women

formed a close-knit group. Anil was not keen on having a formal structure for these groups. They do not meet at fixed periods but meet as and when needed. A typical group would be called by the name of a goddess or a season, followed by the village name, SRI-Mahalakshmi Group Barsona, for instance. There appeared to be a solidarity of sorts between members of a group.

A VRP is the link between the village community and the PRAN team. SEWs oversee the work of 10-15 VRPs and a programme manager with territorial responsibility is in charge of about six SEWs. PRAN office in Gaya has subject matter specialists, accounts, administrative and HR executives and of course the chief functionary. The total strength of PRAN is about 30, with over 325 VRPs. PRAN's total salary bill is around Rs 6 lakh each month. VRPs are compensated for their time on a 'task completion incentive' basis. For example, for enabling a marginal farmer household to adopt SRI completely, a VRP would be compensated with Rs 150. SEWs, project managers and the rest of the staff are regular employees of the organisation.

PRAN has a clearly defined exit policy. After demonstrating the system intensification method for a range of crops in a village for three years and having built the capacity of the VRPs, they move on. To aid this further, Anil has been experimenting with what he calls private service providers. The service providers undertake SRI for a farmer on a contract basis. They also prepare and supply organic manure and pesticides to any farmer in need of them. This is planned as a self-sustenance for the SRI programme, but it is in its early days to see if the plan would work.

Having been groomed in PRADAN and following the strict discipline of Nagarajan and Associates, a firm of auditors, Anil had been quite particular about the need to formalise systems and processes within PRAN. Opening of bank accounts for all the staff under Jan-Dhan Yojana was one more step towards complete formalisation. With no cash transactions, there is complete transparency on financial management. All operations such as accounting, procurement, etc. are carried out as per in-house protocols and manuals.

On the personal front

Anil is the third of his parents' five children. His father was employed in the postal department in Aurangabad district. He had to take a voluntary retirement due to an illness and passed away in 2004. Anil lives with his wife and mother in Gaya. His twin sons are studying engineering in Bhilai. "I have been most fortunate in getting complete support from Archana, my wife. She has strong inclination for social service and hence feels that there is much merit in what I have been doing. I never faced the pressure to give up development work for earning more money. I did have to think a bit while giving up my job in PRADAN and start down an uncertain path. My sons were just in school then. But Archana supported me wholeheartedly and continues to do, so that I can devote myself entirely to my work. She runs the house. Only when contacting people outside Gaya or arranging for finance, she seeks my help. She has been a tremendous asset. I would like to give all credit to her," he said.

Looking ahead

Anil hopes to build a group of second rung leaders. He tries to equip his staff through training and capacity building. Anil liaises with donors, the state and the scientific community, besides developing and negotiating new projects. He wants to ensure that his colleagues too will handle these in future. Anil wishes to slowly broaden the portfolio of services, particularly in the field of health and education.

Annexure

Recipe of main preparations in NPM

SN	Item	Ingredients	Recipe for preparation	Applications
1	Neemastra	Neem leaves, cow urine	Neem leaves are crushed and mixed with cow urine. The mixture is kept for 24 hours, filtered and stored. 30 ml of solution is added to a litre of water and then applied.	Prevents insect / pest attack
2	Mathastra	Sour curd	Sour curd is diluted to produce matha and kept in a closed vessel for 5-6 days. 30 ml of resultant liquid is mixed in a litre of water and used as a spray	Prevents viral attacks on crops
3	Agniastra	Neem leaves, cow urine, green chillies, garlic and ginger	Neem leaves and other substances are ground to a fine paste and boiled with water. Mixture is taken off the flame when it bubbles and allowed to cool. Process is repeated thrice. After cooling, the mixture is filtered. 15 ml per litre of water is used as a spray	Controls most insects
4	Brahmastra	7 different plant leaves of which 4 are bitter / pungent; some overripe fruit and cow urine	All leaves and fruit are crushed and mixed with cow urine. Diluted with water and boiled thrice as in the case of Agniastra. Cooled and filtered. 15 ml of concoction is mixed with one litre of water and used as a spray	Controls all insects
<p>Note: All these would work in conjunction with other measures such as sticky cards and pheromone traps as well as bird perches.</p>				
6	Jeevamrit	Cow urine, besan, cow dung, jaggery	Mixture prepared and allowed to ferment. Culture added near root zone or spread in the farm	Helps create microbes and humus, also provides micro-nutrients
7	Pranamrit	2kg oilcake, 5 kg poultry dropping and 3kg fuelwood ash	All substances are powdered and mixed properly and wetted with cow urine. Allowed to remain for a day or two. The solid mixture can be stored for a long time and applied to plants as manure	Very powerful manure and works in the same manner as above; and provides micro-nutrients

				directly
8	Azolla	Azolla culture	Added to a water tank and allowed to flourish. Once grown, Azolla plant is mixed to moist soil	
9	NADEP compost	Biowaste, culture and plain soil	Alternate layers of biowaste and soil are allowed to compost in a tank with aeration facility	Serves as both a mulch and a soil nutrient by increasing microbial population

About Anil Verma

- Works among the poorest and oppressed Mahadalits in 300 villages of Gaya and Nalanda districts in north Bihar
- Popularised System of Root Intensification (SRI) in paddy, wheat and mustard among other crops
- Helped farmers achieve a record yield of 22.40 tonnes per hectare through SRI, against the average yield of seven tonnes through conventional cultivation
- Advocates strengthening of societal roots for harmony and peace to prevail
- Has developed farm implements to suit local needs, besides concoctions for natural pest management

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