

# Sustainable Agriculture – A New Partnership Paradigm in Dantewada

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## 1. Heralding Green Revolution in Independent India

Upon breaking the shackles of colonisation in 1947, India was plagued with starvation and famine in several parts of the country. As a young independent nation, agricultural production wasn't sufficient for the growing population. Several causes have been attributed to this glaring gap between supply and demand. Lack of modernisation in the agriculture sector and the prevalence of primitive methods of farming were attributed as the major cause.

In the early 1960s, the Green Revolution (henceforth, GR) was pedestaled as the saviour of India's farmers and food deficient people. This involved the use of chemical fertilizers, irrigation infrastructure, and high yielding variety (HYVs). GR promised to tackle chronic food deficit by increasing yield and making the country self-sufficient in food grain production. These developments were supported with institutional interventions like Minimum Support Price (MSP) protocol, subsidies on chemical fertilizers, improvement in rural infrastructure, and so on.

### 1.1 Contestations on Green Revolution

However, the critical appraisal on GR highlights some of the major problems in the technical interventions with serious environmental and economic consequences.

“However the assumption of nature as a source of scarcity, and technology as a source of abundance, leads to the creation of technologies which create new scarcities in nature through ecological destruction. The reduction in the availability of fertile land and genetic diversity of crops as a result of the Green Revolution practices indicates that at the ecological level, the Green Revolution produced scarcity, not abundance” (Shiva, 1991)

Evidence suggests that the Indian states of Punjab, Haryana, Tamil Nadu, Maharashtra, and Andhra Pradesh are currently reaping the repercussions of GR. These implications are environmental, social and economic in nature. Farmer suicides, reduced ground water tables, pollution of land, rivers and decrease in soil fertility have arrived as a package to the doorstep of the India's agriculture sector.

As agriculture expert Mr. V. S. Arunachalam quotes, “Monoculture is not suitable for the culture of [Indian] farming and science can be applied in the market and not in [farming] culture” (V. S. Arunachalam, 2016, personal communication, 9<sup>th</sup> June).

*While the success of GR has raised questions at the global level, many countries have discouraged non-organic farming; smaller states like Sikkim and Bhutan have taken bold steps towards organic agriculture.*

Amidst these contestations on the nature of chemical farming, District South Bastar Dantewada (henceforth, Dantewada) has started a movement towards sustainable agriculture led by the strong vision of the District Administration (henceforth, DA).

## 2. Dantewada at a Glance

District Dantewada was created out of the old Bastar district after its division into Kanker, Bastar, and Dantewada districts in 1998. It derives its name from its presiding deity, Devi Danteshwari, the goddess worshiped as an incarnation of Shakti (Strength). Dantewada is marked by volatile left wing extremism, shrinking natural resources, underdevelopment, and other challenges.

Dantewada is situated in southernmost part of Chhattisgarh with 60% of its land covered by semi-tropical forest. As per Census 2011, Dantewada has a population of 5.3 lakhs with 82% of its population residing in rural areas. More than 75% of the population is tribal with a literacy rate of 42%, far below the national rate of 74%. Considered as one of the most remote districts in India, it is home to the tribal community Madiya Gond. Given the vacuum of livelihoods options, more than 60% of the district population falls below poverty line with Infant Mortality Rate at 54 per 1000 persons, higher than national average of 43.19 per 1000 persons. The people of Dantewada inhabit small scattered hamlets and lack communication facilities like roads and postal services which is unthinkable to many, in modern times. The rule of Tribal Kings in the region continued to exist during British Raj as a princely state. The Bastar dynasty was closely knit with the tribals and their culture. It retained their customs, traditions and therefore, the tribals of Bastar were “free from the harassment and unsympathetic petty officials, and their land was not threatened by the greed of alien immigrants” (Fürer-Haimendorf, 1982). Due to its remoteness, challenging terrain, thinly dispersed population and presence of left wing extremism, it remained relatively untouched by the administration for long.

## **2.1 Livelihoods in Dantewada**

The tribal communities have been dependent on natural resources for their livelihood. This includes forest resources and to a minor extent shifting agriculture. Abundance of forest resources that once existed provided them with wood and other produce crucial to their survival. Agriculture was a subsistence safety net, only practised in the Kharif season (monsoon).

In earlier times, natural resources in Dantewada were abundant and users were limited and dispersed. People were living in harmony with nature and while they had no rights over resources, communities exercised collective ownership. As time passed, several factors led to livelihoods insecurity in the district as discussed below:

## **2.2 Mining in Chhattisgarh**

The state of Chhattisgarh is plentiful in mineral resources. Large deposits of coal, iron ore, limestone, bauxite, and tin ore are located in several parts of the state. These mineral resources, by their very nature have immense potential for attracting large investments in mining and therefore employment generation. Chhattisgarh is extensively mined like other neighbouring mineral rich states of Jharkhand and Odisha. In Dantewada, the Bailadila iron ore mines are excessively mined but the district hasn't been industrialised per se. Similar to the mining sector in other parts of Central India, here too it faces opposition by the tribal groups in the district.

## **2.3 Loss of Forest Rights**

Another important factor is the loss of customary usufruct rights of the local tribal communities due to enactment of state policies such as the Indian Forest Act (henceforth, IFA). IFA, on the premise of ecological protection of forests, banned shifting cultivation, which forced the local communities to practise settled cultivation. The appropriateness and practicability of this step is debatable even today. The tribal groups who were dependent on forest based natural resources for their survival lacked the skills to negotiate with market forces. Moreover, the activities of the left extremist rebel groups in the district at times created a virtual war zone. Therefore, there were a multitude of challenges of insurgency, poverty, underdevelopment, low productivity in agriculture and lack of overall development intervention. The district was caught in a snare of vulnerabilities given the shrinking natural resources due to climate change, increase in population, irreparable damage due to mining, and the lack of intervention for generation of alternate livelihood opportunities. As a result, the tribal communities shifted from forest based livelihoods to practicing settled agriculture, given the pressure to survive. These changes further pushed the people of Dantewada into livelihoods insecurity.

## 2.4 Settled Agriculture in Dantewada

The tribal communities have historically interacted with those residing in the plains, and therefore, practicing agriculture was not alien to them. But their techniques were primitive. In shifting cultivation they used to incorporate techniques such as seed broadcasting, with no or ineffective use of bullocks.

The communities' farming techniques were not equipped to adapt to intensive cultivation required in settled agriculture. The adaptation on the part of the farmers, hence, was not smooth and gradual but accelerated and forced. The communities have yet not been able to fully adapt to the standard practices of settled agriculture. As per Census 2011, 81% of the total workers are dependent on agriculture either as cultivators or as agricultural labourers.

## 3. (By) passing the “Green” Revolution

While India was going through agrarian reforms, Dantewada was still trying to grapple with the methods of intensive cultivation practised in settled agriculture. About fifteen years ago, when the practices GR reached Dantewada via the Agriculture Department (henceforth, AD), it called for replacement of traditional seeds with HYV seeds, development of irrigation infrastructure, and use of chemical inputs, etc. However, Dantewada couldn't embrace these developments due to the following reasons:

- Geographical remoteness
- Insufficient staff in AD until 2013
- Lack of adoption of chemical inputs due to incompatibility with technique of seed broadcasting
- By the time these interventions reached Dantewada effectively, the negative impacts of GR were visible in other parts of the country
- Left Wing Extremism and limited accessibility
- Reluctance of farmers due to their own experiences with chemical inputs

One of the farmers, from *Halbaras*, a village in Dantewada quotes (Anonymous, 2016, personal communication, 22<sup>nd</sup> June)

“At night, staff from the AD used to sneak into our fields and apply chemical fertilizers. When the yield was seemingly more than the previous year, they would tell us that they had applied chemical inputs in our fields.”

A group of farmers of the district speaking about their experience with chemical fertilizers narrate (Halbras and others, 2016, personal communication, 15<sup>th</sup> July)

“It was difficult to farm using oxen. Species like earthworm, frog, fish and snakes started disappearing from our fields. Women’s use to feel burning sensation in their feet while carrying out transplantation. Our pockets were getting increasingly empty, and so was our health.”

The negative experiences of the farmers discouraged the use of chemical inputs in cultivation. Dantewada failed to adopt practices under GR. As claimed by AD in 2013, the District was consuming only four kilograms of chemical fertilizers per hectare when Chhattisgarh as a whole was consuming around 92 kilograms per hectare.

### **3.1 The District Administration’s Call**

Having almost skipped the GR, the district administration came to a critical decision making juncture. One option was to continue with the agricultural policies of the government that were proving unsustainable given the national experience and another was to design one’s own policy pathway towards sustainable agriculture. The concept of ‘sustainable agriculture’ has varied notions, however there exists a consensus that it primarily denotes being in harmony with ecology, the centre being human and social capital, involving an integration of modern techniques with traditional knowledge that helps additionally enhance financial capital. Organic farming considered as one of the techniques of sustainable agriculture is not an alien concept to the rural population of India.

Considering the fragile tribal socio-cultural fabric of Dantewada, unemployment, volatility of conflict, lack of infrastructure and a developed and diversified market, commercial agriculture through GR did not seem like a viable option. Therefore, a new way forward was contextually significant. The tribal communities are not skilled agriculturists; however, they have a plethora of traditional knowledge.

These communities have historically cultivated several varieties of pulses, small millets like *Koda*, *Kosra*, and rice-black, red, half red which includes varieties like *Sapri*, *Javaphool*, *Dubraj*, *Kalamali*, *Chudi*, *Lokti machi*, etc. These

varieties are grown in different seasons and terrains and many of them have aromatic properties.

A farmer from *Bade Bacheli*, Dantewada shares that some of the varieties grew up to a height of 6 feet while other varieties grew all-round the year, being sown in April and harvested in December. Amongst these climate resilient varieties, there are also those having medicinal properties, used by the tribal communities for gastric and other stomach related problems including the famous *Hardighaati* which can be consumed by diabetics. The traditional species have survived and evolved over centuries, battling extreme climatic conditions.

With increasing potential for organic farming the DA chose the path of sustainable agriculture over blindly following the national policies and decided to promote a practice of organic farming to write a new paradigm in development of agriculture in the district.

### **3.2 DA in Action**

It was well understood that new policy efforts would require a strong institutional and regulatory framework and a multifold of agencies, schemes and other entitlements to help drive the central motive of improving livelihoods through organic farming. The DA has ensured, in parallel with the principles of sustainable agriculture, that ecology and farmer are the centre of benefit and goodwill. This is evident in the measures below:

#### **Chemical Inputs Discouraged**

Chemical inputs were being earlier promoted by AD and District Central Cooperative Bank (DCCB). To tackle this, in 2014, DA got the rules of DCCB altered, in consultation with state government. Earlier loans under Kisan Credit Card (KCC) entailed the ratio of cash and chemical inputs as 60:40. This was changed to 100% cash unless a farmer demanded otherwise, thereby leading to reduction in uptake of chemical fertilizers. Change in the rule led to minimal consumption of chemical fertilizers. From distribution of 244.550 tonnes of chemical fertilisers by DCCB in 2014, it became zero in 2015. With the change in rules therefore, the DA was able to curb the passive promotion of chemical inputs by AD.

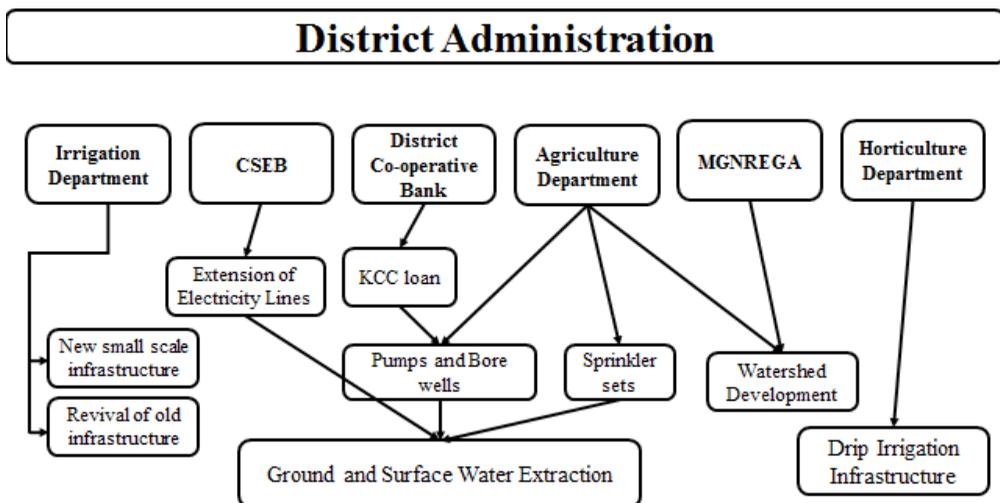
## Training of District Staff

DA used training as an effective tool for conscious promotion of organic farming. Provisions under other schemes were modified and the staff was trained by agriculture experts in 2013. The results were visible as the consumption of chemical fertilizers in Dantewada came down to 0.52 kilogram per ha in 2015.

## Expanding the Irrigation Infrastructure

Average annual rainfall of the district is 1536.5 mm. The current irrigation infrastructure does not cover even 5% of the total area under cultivation. Agriculture in the area was mostly rainfed, which was one of the main reasons for low productivity combined with the practice of single cropping. 17 out of 27 irrigation systems covered only 635 ha. Irrigation infrastructure covering 50% of the total area being irrigated by the Irrigation Department were revived or repaired and check dams covering 105 ha. were additionally constructed. Under Subsidy Schemes, Chhattisgarh State Electricity Board extended electricity connections for groups of farmers. AD provided financial linkages through KCC and also commenced watershed development activities; subsidised pumps were provided for bore wells. Through some recent efforts, AD has also provided drip irrigation and sprinkler sets to farmers covering approximately 50 ha. The total area covered under irrigation by AD is 1311 ha. Another 100 ha has been covered under the drip irrigation scheme by the Horticulture Department where the cost sharing between state and beneficiary is 60:40. However, the DA sponsored another 80% of the 40% share of beneficiaries for the benefit of farmers.

Figure 1: Irrigation Infrastructure Development by Various Departments



## 4. Promoting Organic Agriculture - Designing a Comprehensive Model

There was a convergence in efforts of various agencies and actors towards the common goal of converting to organic agriculture and betterment of livelihoods of local population. Such arrangements allowed for cushioning of all kinds of vulnerabilities that the farmers were susceptible to while making the transition. The lack of access to credit, scarcity of water for irrigation and the possibility of being attracted to using chemical inputs were all taken care of by the comprehensive institutional arrangements. This co-ordination and support to the farmers at every stage enabled the DA to move towards designing a comprehensive model right from production to market linkage. The three prongs of the model are as follows:

1. Organic farming infused with SRI (System of Rice Intensification)
2. Provision of Infrastructure Facilities
3. Incubator
  - a. From DA to farm
  - b. From farm to market

### 4.1 Organic Farming Infused with SRI

The average paddy production in the district was around 11 quintals per ha in the year 2012 as per the AD of Dantewada. Low yield was one of the major concerns to be tackled first. In order to improve the yield, the DA promoted the System of Rice Intensification (SRI) technique commonly known as '*Shree Vidhi*' in Dantewada. It is a set of cultivation practices adopted by farmers according to their local conditions which enhances the activity of root, and increases the number of tillers leading to higher yield. The method is known to be knowledge and skill based rather than input based.

The Rural Extension Officers (REOs) of the AD, encouraged and trained the farmers to prepare organic inputs such as *jeevamrit*, *bijamrit*, *handi dawa*, *panchgavya*, etc. using cow dung, cow urine, and other locally available resources. Farmers were provided with Poly Vinyl Chloride (PVC) drums in order to facilitate production of inputs and deweeder for the weeding process.

Organic farming arrived in Dantewada with improvement in technique leading to increase in output to an average of more than 30 quintals per ha.,

primarily due to adoption of SRI. The benefits of adopting this technique have been two fold. First, the cost of inputs was reduced as they were mostly locally available and second, there was an increase in yield. Practising farmers mobilised more farmers and brought them into the fold of SRI. Even those farmers using chemical fertilizers began adopting SRI based organic farming. As depicted in Table 1, the district experienced more than 200% increase in the area under SRI cultivation in year 2014 and even though 2015 was a drought year, the number of farmers adopting SRI decreased but the area under SRI did not decrease substantially. In 2016, the numbers are expected to increase by more than 100%.

Table 1: Key Impact Figures

Year	No. of Farmers	Area under SRI (in ha)
2013	274	71.10
2014	743	260.55
2015	419	242.3
2016 (Expected)	1000+	600+

Source: Department of Agriculture, Chhattisgarh

## 4.2 Provision of Infrastructure Facilities

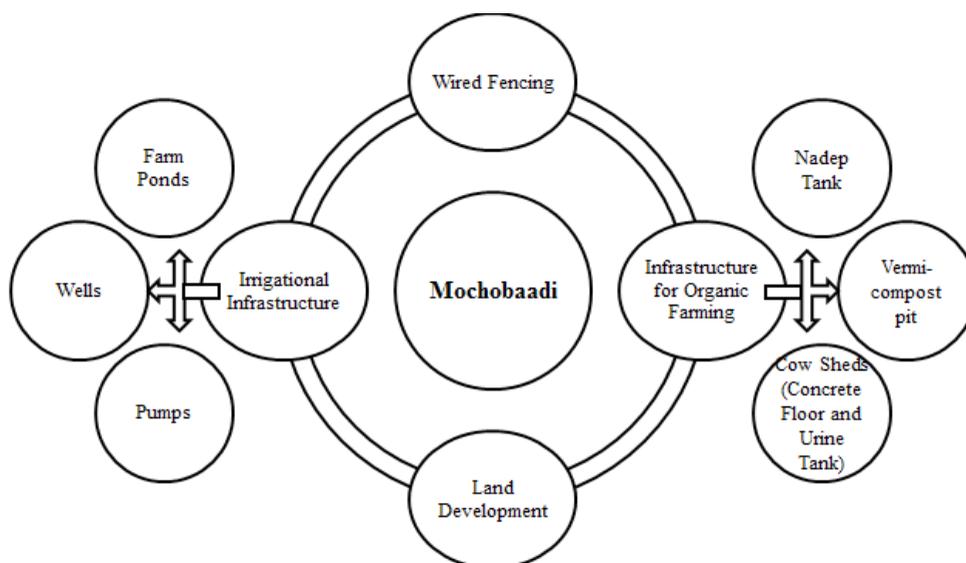
There happens to be a systemic limitation in rural development processes when decision makers are in a particular position for a short term and there is a fear of change in policies by the successors. Former District Collector of Dantewada, Mr. K C Devasenapathi faced the same dilemma and had to make a decision before intervening. The question was whether to lay emphasis on enhancing capacity building among farmers or give priority to providing infrastructural support. With an aim to have the maximum outreach, he chose the policy route of focusing on providing infrastructural support and let capacity building catch up as it is a relatively long term process.

## 4.3 Launching of Mochobaadi

*Mochobaadi*, meaning ‘My Farm’, is a programme launched by DA in the year 2013 which encourages farmers to cultivate vegetables, pulses and oilseeds, along with traditional paddy. Farmers were facing two main obstacles i.e. open grazing of cattle and lack of adequate irrigation facilities. This programme came up with a package of interventions including wired fencing of fields, irrigation infrastructure, infrastructure for organic farming, and land development. The programme that was launched in the district is one of its kind. Fencing is helping the farmers save their field from cattle left freely to graze after Kharif season. Irrigation systems promoted under the programme include *Dabri* (farm pond), well, and a pump to enable low cost and effective

irrigation to the farmers. Infrastructure for organic farming include *Nadep* tank, vermi-compost pit, and cattle sheds that include a concrete floor and urine tank. Given that Dantewada has a hilly, undulated terrain, the scheme of Land Development covered the component of marking the land in order to use SRI technique. More than 1200 farmers from more than 100 different villages of the district have benefited from the scheme. These schemes together, in effect, were meant to promote sustainable farming, double cropping and vegetable cultivation. For vegetable cultivation, 10 batches of 50 farmers each were given training on Participatory Guarantee Scheme Organic Council’s certification, quality control, and integrated manure management by Horticulture Department in year 2015. Plans are on to increase the numbers. This, one of its kind hybrid scheme required mammoth funds and workforce, therefore, funds were redirected from Mahatma Gandhi National Rural Employment Guarantee Scheme, Integrated Action Plan, Backward Regions Grant Fund, CSR funds of National Mineral Development Corporation and other different schemes of AD.

Figure 2: Arrangements in Mochobaadi



## 4.4 Incubator

### From DA to Farm

DA realized the need for a synchronized effort and intervention at the level of the farmers, beyond policy planning. It therefore created an incubator to promote and sustain organic farming.

Farmers were organized into groups. More than 75 groups with more than 850 members were registered with the AD. About 40 more groups are

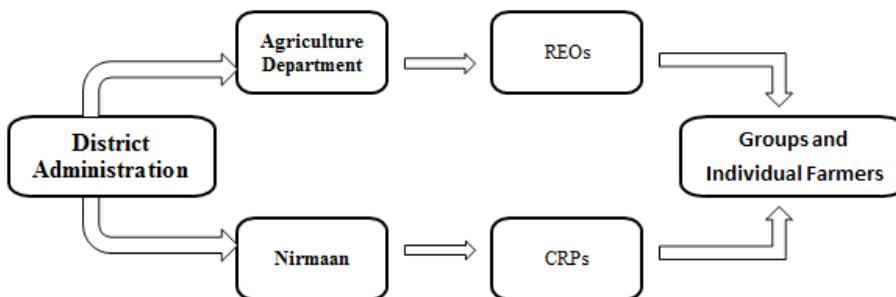
currently seeking registration taking the total number of participants to above 1200. These registered groups hold regular meetings, attend training programmes and strengthen their social capital thereby practicing better farming with each other’s support while reducing the cost of labour as the farmers help each other in fields during sowing, weeding, harvesting, etc. These groups are not only points of contact for the state but also nourish local leadership and empower communities.

The AD holds the responsibility of mobilising farmers, building their capacity and conducting training programmes. For strengthening the outreach and efficiency of the training programmes, DA has involved a Non Government Organization, Nirmaan<sup>1</sup> since December, 2015. Nirmaan has appointed young and educated Community Resource Persons (CRPs) from villages who speak *Hindi* as well as the local languages *Gondi* and *Halbi*. These CRPs are locally known as *Jaivik Karyakarta* who cover two to three villages as assigned and undertake the following tasks:

Figure 3: Framework for Communication, Mobilization, Training and Capacity Building of Farmers

- Community mobilization – Strengthening of existing farmer groups and formation of new groups
- Crop planning and monitoring
- Training and capacity building
- Consultation on demand
- Record keeping

Figure 4: Empowering Community at Grassroots



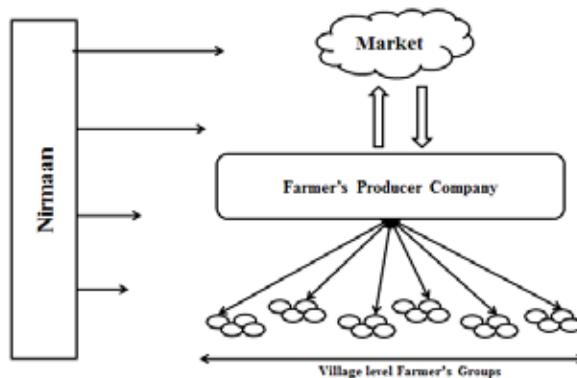
In order to revive the cultivation of traditional varieties of seeds, CRPs are promoting the preservation and cultivation of these varieties. The CRPs are sensitized and trained in their monthly meetings by educating them through visual media. They are shown videos like ‘Toxic food- Poison on our Plate’, Satyameva Jayate, SRI training and talks by experts. Training visit for farmers, AD staff and CRPs are also arranged regularly to Hyderabad, Nagpur, Odisha, Tamil Nadu, etc. where sustainable agriculture practices have been successful.

### From Farm to Market- Farmer Producer Company

In today’s time, market has emerged as a site of exploitation of the marginal and small Indian farmer. The market, given its economic importance, has direct relevance on farmers’ livelihood. Earlier, the exposure of tribal farmers was limited to *haat* (local market). In Dantewada a Farmer’s Producer Companies owned by the tribal farmers has been promoted, where the benefits can be reaped by the farmers themselves. At the village level, the famers are organised into village level groups, further federated into Farmer’s Producer Company- *Bhoomgaadi*, named after a festival of tribal farmers. Bhoomgaadi aggregates produces from farmers and stores, processes and sells it under the brand name ‘*Aadim*’.

The role of NGO Nirman is in incubating the FPO and assisting the company in management and operations until the shareholders (farmers) are capable of running it on their own. Having the backing of 44 Participatory Guarantee Scheme Organic Council certificates, an organic store<sup>2</sup> was opened in district Dantewada in June, 2016. The procurement for the outlet is not limited to the district or the state of Jharkhand. “The organic products are purchased from Jodhpur-based ‘Banyan Group’ to Hyderabad-based ‘Sahajahar Group’ and other parts of the country” (the pioneer, 2016). Further one grain processing unit and an organic store with cafeteria are in the process of being set up.

Figure 5: Building Inclusive Value Chains



## 5. Way Forward

The use of insecticides and herbicides in the district especially by vegetable cultivators is a major challenge. Vegetables require effective management to be harvested organically and intense capacity building and training will be the key to face this challenge. Workforce in public administration has increased; however, it still does not suffice the requirements of different departments. The reach of interventions has improved now, given that NGO Nirmaan is also performing the functions of outreach, mobilization and capacity building among farmers. In the AD, 27 vacancies existed (as on June, 2016), of which 18 are for REOs who are supposed to be the main promoters of the SRI technique. Out of 64 positions, 24 vacancies exist in the Irrigation Department and 7 field staff vacancies are there in the Horticulture Department.

The organic farming efforts have slowly begun reaching the remote areas. The formation of village level groups ensures strengthening of the backward linkage. A crucial concern is on managing the forward linkage, with the market. Even with support from Nirmaan, it is a challenge to capacitate the tribal forest dwellers to manage their own company. However, looking at the empowered community, one can sense the optimism for bringing about this change.

Policies incline towards the majority. Amidst these challenges, the progress in the last three years had grabbed attention of state government and it has begun supporting the same. In the year 2014, the district was selected under scheme of *Jaiwik Kheti Mission (JKM)* that promotes organic farming. This year the target for the scheme is to cover an area of 2500 acres. JKM provides funding support for trainings, exposure visits, certification, infrastructure development and grants for organizing *Kisan Mela*, so the farmers at district level come together to realize their social capital, feel motivated and empowered. A similar scheme, *Paramparagat Krishi Vikas Yojna* had set a target of 750 acres to be brought under the fold of organic farming, but the overall targets by DA go much beyond these numbers. The efforts have shown their impact and the government of Chhattisgarh has announced for developing Dantewada as organic farming district in 5 years' time.

These efforts call for a new paradigm of democratic governance. It demands a shift towards approaches, policies and programs that are not fragmented, but rather remain holistic, at the level of implementation. Dantewada has tried to imbibe such an approach by incorporating both modern scientific advice and harnessing traditional knowledge. An instance, of this is the previous District

Collector Mr. Devasenapathi, who also showed remarkable openness and willingness to learn and accept suggestions from experts in organic farming such as V. S. Arunachalam.

In view of the comprehensive institutional arrangements, Dantewada stands as a model of new partnership. Literature has long established the relationship between good governance and development. The district has shown an exemplary model of development through effective management of public resources by public institutions and active stakeholder involvement. When good governance exists at the local level, it can effectively engage citizens. This is working effectively in Dantewada with the creation of village level groups.

The creation of local entrepreneurs, innovators and change agents can go a long way in fueling the sustainability of these rapid changes. Handing over the responsibilities to local population gives them a sense of ownership for the change that is being collectively sought.

The nature of governance spurred by the DA has led to multiple actor partnerships, an efficient and effective public sector, legitimacy, access to knowledge and information, equity and sustainability. DA, to a great extent has been able to bridge the gap between citizens and the state as evident from a personal interview with a farmer who stated that the District Collector has come into our life as a blessing (Anonymous, 2016, personal communication, 24<sup>th</sup> June). This kind of identification with public administration is not commonly heard of, and has taken the earnest efforts of inspired leadership by the DA.

This partnership model is one which involved people who were unequipped with modern day practices and techniques but had an abundance of traditional knowledge and natural resources. The District Administration experimented by deploying an alternative strategy of development in collaboration with people which was close to the tribal ways and means of living. As a result the farmers are learning from experts, scientists and their peers. Capacity building efforts are enabling their interaction with external forces of market. The visionary leadership of DA and local empowerment is showing the promise of a new livelihood paradigm in the resource rich state of Chhattisgarh.

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