Agricultural Production Clusters

RAHUL KUMAR, DEBANJAN GHATAK AND
SYED REHMAN, WITH GRETCHEN PHILLIPS

Well-developed mutual aid and support groups of poor people can be the building blocks of large-scale social mobilization, leading to a change in the self-belief and identity of an entire community of people.

BACKGROUND AND RATIONALE

Since the country's independence in 1947, India has made great strides in agricultural development. Cereal production has more than quadrupled and the country has attained self-sufficiency in food grains production. These gains, however, have not been uniform across the country. Whereas irrigated plains and deltas have developed, the largely rain-fed, undulating, hilly and mountainous regions have lagged far behind. Farm productivity in these regions remains very low and farming a highly uncertain enterprise. In the rain-fed regions of central India, almost three-fourths of the population derives its livelihood from the farm sector. Not surprisingly, these regions face extreme poverty and have become hot spots for civic strife, led largely by violent leftist movements. Rapid agricultural development is thus imperative to remove mass poverty, spread the fruit of development equitably, reduce social strife, spur sustained economic growth and secure ecological stability.

Fortuitously, investments to develop these rain-fed regions have high economic returns because these areas have had little prior investment and there has been little or no capital formation; many, indeed, would argue that overall there has been capital erosion. The interventions required to develop rain-fed regions are highly labour intensive and, therefore, will also provide much-needed employment on a large scale and in the short run.

Irrigation has been the prime mover of agricultural growth in the plains, combined with new, input-responsive crop varieties—the so-called Green Revolution 'package'. Rain-fed regions are not endowed with significant and widespread irrigation potential. Thus, agricultural development in these regions calls for a fundamentally different approach that intertwines resource husbandry into the production system, rather than looking at it as an input-to-output transformation process. Given the scale and concentration of poverty in this area and its impact

on national food security and ecological stability, it is imperative to have a focused national effort to develop agriculture.

PRADAN introduced the concept of Agricultural Production Cluster (APC) with the objective of bringing together 3,000 to 4,000 families for intensive farming. This method of farming will form a crucial component in establishing sustainable linkages with the market, and the farmers will be able to, in the long run, access these markets even without the support of PRADAN. The APC also focuses on developing input linkages; eventually, these clusters will become a hub in which all services, ranging from cold storage, processing industry, credit facility, input supply and market, will be available for the farmers in close proximity.

GOAL

In a period of four years, from April 2009 to March 2013, PRADAN will assist 70,000 rural families from Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan and West Bengal, to become involved in sustainable farm-based livelihoods. PRADAN plans to enhance family incomes by 75-100 per cent, that is, by Rs 12,000-15, 000 per annum. Simultaneously, an additional 50,000 families will participate in various interventions under this project and will be at different stages on the path of sustainability, enhancing their incomes by 100 per cent.

In the process of implementing this project, PRADAN will develop and fine-tune community based institutional models for scaling up, and will introduce new extension methodologies, using ICT and knowledge building and sharing, with national and global perspectives.

WHAT IS AN APC?

APC is a concentration of producers, agri-business players and institutions from the same sector. It addresses challenges that are common among producers and provides opportunities for growth for them and other stakeholders. An APC promotes inter-firm cooperation, provides efficient channelling of public support and increases competitiveness among stakeholders.

Considering the problems poor people face to harness the potential of farm-based livelihoods, a multi-pronged strategy is needed to achieve this goal. Broadly, the issues that need to be addressed are:

- Stimulating confidence among poor people in their own abilities
- Helping them realize the potential of their farmland by jointly developing and implementing viable micro-level plans to enhance its carrying capacity and productivity,
- Leveraging finances to implement plans
- Building skills of project families, to realize the potential of farm-based livelihoods
- Fostering linkages with markets

STAGE I: SOCIAL MOBILIZATION

Large-scale mobilization has always been known to change the self-perception of the poor and oppressed communities. Whereas social and political movements have historically been the harbinger of such mobilization, there is evidence from the grass roots initiatives now (including from PRADAN's projects) that a systematic process

of working with small groups for mutual help around existential issues such as access to credit in emergencies can also lead to significant social mobilization. Experience suggests that well-developed mutual aid and support groups of poor people can be the building blocks of large-scale social mobilization, leading to a change in the self-belief and identity of an entire community of people. Keeping this perspective in mind, PRADAN organizes the most vulnerable among the poor, that is, women from poor families, into small (10 to 20 members), self-selected Self Help Groups (SHGs) with small savings and credit as the initial purpose. As these groups stabilize, cluster associations and federations of SHGs are formed and nurtured, in close geographic proximity. A larger coalition enables the women to tackle issues of identity and roles—as women and as poor people. The SHGs take up social issues affecting members such as domestic violence and poor public services in numerous cases in the project.

The unusual experience of working outside their traditional domains, solving their own problems without beseeching others for small needs, working with similarly placed others and the assurance of mutual support, develops confidence and keenness among women to work towards changing their lives in concrete ways.

The unusual experience of working outside their traditional domains, solving their own problems without beseeching others for small needs, working with similarly placed others and the assurance of mutual support, develops confidence and keenness among women to work towards changing their lives in concrete ways. Envisioning, planning, experimenting, taking risks, challenging and making demands become possible. This forms the platform for the next stage when women with their families will make livelihood plans, access finances from banks and government programmes, and manage market linkages. Simultaneously, unknown to the women, a grass roots social infrastructure is created, as a base to launch a fast-paced and large-scale development programme.

STAGE II: PLANNING

At this stage, PRADAN helps group members and their families develop concrete plans to improve their livelihoods, taking their assets and endowments into account. Because almost all members own land, the primary focus is one of enhancing its carrying capacity and productivity. An Integrated Natural Resource Management (INRM) plan is prepared for the entire hamlet. It typically includes resource-enhancing measures such as decentralized rainwater harvesting; resource-development measures such as wells and other means of irrigation; productivity enhancing plans such as induction of better farming technique; intensive cultivation of market-oriented crops such as vegetables; and measures that serve all three purposes such as diversification of land use into tree crops, soil enrichment, composting, etc.

STAGE III: IMPLEMENTATION

The process of planning and its subsequent implementation is done in a manner that the SHG members and their families take responsibility and ownership. Skills and knowledge are imparted to them so that they do not depend on PRADAN for long. The PRADAN staff work with the SHGs to make micro-plans and set norms and systems to implement them. Developed jointly, these norms set priorities, sequence the activities,

cost and responsibility sharing, setting up of the project management mechanism, etc. Typically, productivity enhancement activities for existing crops are implemented right away, using modern techniques.

The process of planning and its subsequent implementation is done in a manner that the SHG members and their families take responsibility and ownership.

The SHGs are assisted by PRADAN to access bank loans and government grants, to implement the various components of the micro-plans. Bank loans are always given directly to the SHGs. In the case of government grants as well, PRADAN negotiates with the government to provide funds directly to the SHGs or other people's organizations. PRADAN staff assists groups to implement plans and maintain books of accounts, which are audited by government officials, in the case of government-funded projects. The SHG/hamlet chooses one of its members to help implement INRM activities and PRADAN then trains him/her as a 'community resource person' (CRP). The CRPs are trained as village extension workers, to help farmers adopt modern farming techniques, and are hosted in community organizations (SHGs, SHG clusters, producers, collectives, etc.). They provide services to the farmers and are accountable to and paid by their collectives for services at mutually agreed rates. Initially, PRADAN subsidizes the cost.

The project also prepares the ground for scaling-up. This entails developing knowledge systems for scaling-up and piloting the idea of building effective partnerships with like-minded organizations to use and adapt systems, methodology and processes developed by PRADAN for poverty elimination in selected poverty pockets of the country.

DEVELOPING KNOWLEDGE SYSTEMS

1. Building know-how and tool kits

- Documenting the knowledge and know-how generated from this project, for example, concept guides, manuals, case studies and training modules for staff and community persons.
- Developing ICT-based, effective agriculture extension methodologies, including the use of audio-video devices, community radio, GIS and weather information usage.
- Developing ICT based-monitoring and evaluation systems that stimulate learning by staff, capture project progress and help measure results on the ground.
- Developing human process tool-kits for standardization and wider replication of human process interventions, as developed by PRADAN.

INFLUENCING THE POLICY ENVIRONMENT IN INDIA

Stakeholder meets (workshops with government personnel, other practitioners and researchers) are organized, to discuss the lessons learned from the project and establish linkages with the media to disseminate project experience.

ENABLING THE USE OF PROJECT LEARNING IN OTHER POVERTY REGIONS, ESPECIALLY IN AFRICA:

- Engaging with civil society practitioners working in other poverty regions. This could be in the form of exchange visits, staff exchange programmes, training events, etc.

- Engaging with donors and multilateral agencies to help contextualize the learning of this project to the programmes and interventions in other poverty zones of the world.
- Engaging with international research studies, to test the efficacy of this approach in poverty elimination.

The key expected outputs are:

- Eight thousand five hundred SHGs of about 1,20,000 women, their cluster associations and federations.
- Comprehensive micro-plans for INRM in 1,500 habitats (hamlets/villages).
- Rs 450 million mobilized to implement plans.
- INRM plan implemented in 40,000 ha of land.
- Six thousand hectares of irrigation potential created through decentralized micro-projects.
- All project participations have annual agricultural plans.
- Twenty-two thousand five hundred hectares of land owned by poor families brought under intensive farming.
- One thousand four hundred CRPs trained and serving the community to achieve the goals of this project.
- Five production and marketing clusters developed.
- Fifteen thousand families engaged in co-ordinated intensive, market-oriented production.
- Five PCs set up for input-output linkages to farmers.
- Linkages initiated between retail chains and PCs as suppliers.
- Seventy thousand project families achieve food sufficiency and surplus of at least Rs 7,000 per annum.
- Five thousand additional families attain the above-mentioned goals by way of support provided to other development organizations under piloting 'non-direct' engagement strategy approach.

The beginning of the 21st century has seen large-scale modification in the agricultural pattern of the world. There have been many innovations, and constant technological up-gradation is taking place all around the world. There has been growth in demand for quality products that has led to high-scale production as well as innovations in retail and packaging. Agricultural needs have grown manifold and this has become a potential tool for the formation of an agriculture cluster.

APC IN GUMLA

Agriculture is the primary source of livelihood for 80 per cent of the families in Gumla. Although the outcomes are currently poor, the potential for agriculture is high, with the ability to ensure not only food security but also an average annual income of Rs 70,000 for families. The existing conditions are promising.

An average family has:

- **Land:** One hectare of land, with irrigation support for up to 30 per cent of the land; Highly suitable for vegetable cultivation
- **Bullocks:** Two to three for agricultural use
- **Labour:** Two or three, unskilled in agriculture
- **Credit:** The SHG is the source for credits, some have access to banks
- **Practices:** Traditional systems of farming with limited use of pesticides and fertilizers
- **Markets:** Deficit regional markets for fresh vegetables
- **Mindset:** Farmers show interest in agriculture as a source of livelihood, with a steady increase in the number of

families shifting from subsistence to cash crops such as vegetables.

Training programmes were also conducted for all the 600 farmers in the APC, in nursery growing, transplantation, wire staking, disease and pest management, and post-harvest technology.

STRATEGIES TO ACHIEVE THE OBJECTIVES OF THE APC IN GUMLA

The team has identified three blocks, namely, Ghaghara, Palkot and Raidih, to anchor the production cluster with an expected outreach of around 3,000 farmers by 2012 and 15,000 farmers by 2015. These areas have been selected, based on farmers' request, availability of resources and the pro-active stance of farmers in adopting new technologies. For each of these areas, a three-year strategy, based on the context and key bottlenecks, has been developed. The key intervention priorities that emerge across APC areas include the following elements.

STAGE I. SOCIAL MOBILIZATION

Social mobilization began with a vision building exercise for the farmers. Concept sharing meetings were organized in all the selected villages by March 2010. The farmers were given exposure to nearby production clusters of Pithoria and Patamda (both in Ranchi). The farmers were also given an exposure to regional markets, to make them understand demand, supply, volumes and the nature of transactions taking place at various *mandis*. The farmers were taken to the Ranchi, Rourkela, Jamshedpur, Ambikapur, Patna (Mithapur) and Durgapur *mandis* for exposure. Some community service providers (CSPs) from each village were trained and sent to various *mandis*, to help them develop entrepreneurial skills.

STAGE II. PLANNING

A large amount of time has been invested in planning, implementing and reviewing of the APC work, both at the team level as well as in the field. Table 1 gives an overview of the planning in the first year of the APC.

STAGE III. IMPLEMENTATION

During the *kharif* planning, a hamlet-level meeting of about 25 families was organized to discuss investments, inputs, the systems for input purchasing, land preparation and the date of planning the common nursery. The team organized a common 'Net House' in the village, where all the farmers would have their own small nursery beds. All the nursery beds would be covered with a net to protect the young seedlings from heavy rain, insects, pests, etc. It was also an opportunity for the farmers to learn from their peer groups.

All the APC farmers in Gumla worked on their nurseries on the same day in two phases (the 1st and 15th of June 2010). This led to transplanting on the same day and, hence, the produce also came in bulk, which helped its aggregation for marketing. Apart from the production advantage, this system helped the farmers recognize the right time for planting the kharif tomato and cabbage.

MARKET STRATEGY IMPLEMENTATION

During the planning stage, the Gumla team had decided to develop village-level entrepreneurs to do the marketing for the APC farmers. One person from among 25–30 farmers was selected, based on criteria such as literacy level, honesty and the willingness to work hard to market the APC products. A stock centre was established in each of the 20 villages where the produce would be sorted, graded and cleaned for sale.

All the APC farmers in Gumla worked on their nurseries on the same day in two phases. This led to transplanting on the same day and, hence, the produce also came in bulk, which helped its aggregation for marketing.

The selected entrepreneur will arrange a vehicle to carry the produce to the market for sale. He then distributes the farmers' share after accounting for the cost. In this marketing system, the entrepreneur plays a major role in the marketing arrangements, in decision-making for the selection of the *mandi* (based on the prices in the different mandis), and in selling the produce at the highest rate. He also deals with the people involved at every stage (vehicle owner, commission agents of the mandi, the Mandi Committee, the labour for loading and unloading, etc.). It was decided that for this entire work he would get a commission of seven per cent of the total sale value, which comes to approximately Rs 500/2 MT of the produce sold. It was expected that at least 50 MT of the produce would be sold from a village; so the entrepreneur would earn Rs 10,000–15,000 per season.

Table 1: Planning at Various Levels–Team-level planning

No.	Planning	Rationale
1.	A workshop with the Gumla team	To understand the present agriculture development approaches and whether there is a need for an APC in Gumla.
2.	Area and family selection planning	Setting up the criteria to assess with whom we need to promote vegetable production and in which villages of the Gumla district.
3.	Crop selection planning	To figure out the most profitable, small-holder/climatically suitable crops.
4.	Marketing strategy planning	To look at the best possible market interventions, the possible *mandi* to start with building linkages.
5.	*Kharif* intervention planning	To choose the best possible intervention for triggering production and finalize the implementing strategy.
6.	Monthly reviewing and planning	Month-wise progress of the APC and discussion on issues.
7.	*Kharif* review and planning meeting.	To be held at the end of the season, to know what worked well and what did not in the entire season.

Table 2: Planning at Various Levels–Farmer-level planning

No.	Planning	Rationale
1.	The APC concept sharing	To identify the need for an APC, farmer vision building.
2.	The APC kharif planning	To make land selection, input arrangement, investment layout, timeline of activities such as nursery, transplanting, etc.
3.	Kharif marketing planning	To discuss farmers' perspectives on marketing and also explore the possible marketing channels.
4.	Monthly activity planning	To help farmers understand that activities need to be carried out according to a timeline.

PRODUCTION

To ensure smooth flow of production in the region, the team will focus on land treatment and land utilization in the most efficient manner. The focus will also be on growing crops that are both profitable, sustainable and cater to the local, regional and national market demands. The production will be increased in priority crops through the adoption of technology and optimal Package of Practices (POP).

The focus is on strengthening market linkages, to ensure timely availability of inputs, reduce cost overtime and secure optimal price realization by improving the quality through sorting/ grading and packaging.

MARKET LINKAGES

The team will focus on strengthening market linkages, to ensure timely availability of inputs, reduce cost overtime and secure optimal price realization by improving the quality through sorting/grading and packaging. The team has built certain linkages but they are not yet enough to cater to the needs of the farmers. It is also exploring regional *mandis* to strengthen the linkages. Building local entrepreneurs for establishing market linkages will also be on the agenda of the team.

ENABLERS

In order to attain the objectives of the programme, the team will work on building farmers' capabilites and perspectives in production and marketing. Training in production technology and motivation for taking up vegetable production as a business is being imparted to the farmers. The team also needs to ensure that farmers have access to the credit they require to invest. Farmers need help to develop community institutions required to support a market-oriented agriculture. PRADAN is also motivating the community to build roads and other infrastructure required to access markets, and is ensuring that the interventions do not increase the farmers' risk beyond their capacity to take it. All interventions need to be sustainable and ensure that agriculture is well integrated with other forms of livelihood.

However, there are a number of factors which affect the productivity and profitability of agriculture in the region. These are:

- **Production:** Even after such an intensive intervention in the region, the focus of the farmers is on subsistence crops such as paddy. Large tracts of land are untreated; this reduces the productivity of the land during the non-monsoon seasons and, hence, vegetable, are grown only during the *kharif* season. Uneven rainfall affects the productivity of the crop.
- **Market Access:** The farmers in the region are not organized; they are, therefore, unable to access regulated markets, resulting in more price volatility and losses to the farmers. Inaccessibility to regulated markets leads to a glut in the local market, which then affects the price of the crop and leads to a loss for the farmers.

DIFFERENCE BETWEEN THE APC APPROACH AND THE TRADITIONAL AGRICULTURE APPROACH

The desired end-state of the APC is not necessarily different from the normal agriculture activities; however, in the APC, there is a holistic approach—not only for agricultural production but also for all the elements of the desired end-state—that includes market linkages, infrastructure,

know-how (human capital) and sustainability of resources.

Some specific elements upon which the APC is focusing on and which were not as much in focus in the traditional agriculture activities include:

- Growing one or two vegetables each season, based on the regional market demand, yield, farmers' expertise/ confidence, competitiveness, agro-climatic suitability, to lead to a sustainable vegetable cluster.
- Reducing the risk through promoting crops or one crop that is highly remunerative.
- Using an area approach, with consideration of family resources, to make a sustainable vegetable cluster (For example: Nasik, Pithoria, etc.).
- Developing backward and forward linkages around potential vegetable clusters.

IMPACT ON YIELD

Despite very low rainfall, the farmers were able to draw a production of 2.5 kilos of saleable yield per plant in the tomato crop. The low rainfall caused problems during inter-culture operations, which adversely affected crop growth. Cauliflower farming was done for the first time in the cluster and the results were encouraging. The selection of the variety was done on a trial basis. Namdhari 60 and 131 are found to be the good varieties for early *rabi*. GS-10 has been found to be a good variety with uniformly filled pod, bearing 10 uniform, healthy seeds per pod. The fruits are very attractive in colour as well as in size. This variety will be used in the next season as well.

Table 3: Impact–Yield and Income Data from Kharif 2010

Crop	Area (Acre)	Germination %	Survival in Main Field %	Production (MT)	Yield (MT/ha)
Tomato	86.4	75	80	750	22
Cabbage	57	60	90	132	7.5
Cauliflower	65	80	80	520	20
Peas	40	75	85	142	10

Table 4: Income Data (Based on Sample Data taken for 30% farmers)

Crop	Net Family	Investment Family (Rs)	Total Investment Family	Average Income (Rs)	Total Income (Rs)
Tomato	576	1,400	8,06,400	8,871	45,77,436
Cabbage	576	500	2,88,000	3,895	17,25,485
Cauliflower	416	600	2,49,600	4,226	17,58,016
Field Peas	428	900	3,85,200	6,653	28,47,484
Total			17,29,200		1,09,08,421

IMPACT ON LINKAGES

A fund of two crore rupees has been mobilized from the District Rural Development Agency (DRDA), Gumla, for 36 lift irrigation schemes in the APC area. Along with these, 11 grading and sorting centres have been sanctioned in these three clusters. The DRDA has provided 11,000 plastic crates for vegetable storage and transportation. Linkages with external stakeholders such as transport agents, commission agents of the vegetable *mandis*, and seed shops have become more vibrant now. Linkages with the banks have been established and almost 50 per cent of the farmers are accessing KCC loan from the leading banks such as the Punjab National Bank and the Bank of India. Crop demonstration has been organized on a cluster basis so that the farmers are able to aggregate the produce. The marketing was very smooth due to collective action. In the aggregated system of marketing, farmers are able to get a consolidated amount just after the sale of the produce, which is very encouraging for them.

IMPACT ON PRODUCTION METHODOLOGY AND MINDSET

In most of the uplands and medium uplands, the cropping intensity has almost doubled now. After growing tomato in the uplands, the farmers now take on another crop of field peas or cauliflower. In addition, the area under vegetable cultivation has increased from 15 decimals to 30 decimals in the *kharif* season. The farmers now grow tomato in almost 20–25 decimals of land, instead of the earlier 15 decimals.

Of the 600 farmers in the first year, 30 farmers did not have their own land and had leased-in the land from the other farmers in the same village. In the second year, the number of farmers who had leased-in land for vegetables is higher. Almost 20–25 decimals of land are leased-in by each farmer. Approximately five per cent of the farmers are landless but still cultivating vegetables.

The interest level/engagements/investments are quite high. In a year, the investment in vegetables is almost Rs 7,000, which is much higher to the farmers' earlier investments. However, the returns are also two to three times higher than their earlier annual returns. The APC is a profitable experiment, which is why landless farmers are also leasing-in land for vegetable farming.

IMPACT ON INFRASTRUCTURE

Three power tillers worth Rs 3,60,000 have been purchased in three villages. Five water lifting devices worth Rs 50,000 have been purchased, and net houses have been created in 52 villages with the farmers' own contributions.

VIBRANT ENTREPRENEUR MODEL AROUND AGRICULTURE—INPUT AND OUTPUT LINKAGES

Entrepreneurs have been selected based on criteria such as interest in business, age, present occupation and education. These entrepreneurs have been engaged in developing linkages with regional *mandis* and existing production clusters through training and exposure. Entrepreneurs have been engaged in procuring input supply for the farmers in bulk. They are also responsible for the sale of the farmers' produce in the market on a commission basis. Advanced technological support in the farmers' fields is also provided by the entrepreneurs.

THE WAY AHEAD

The experiment in Gumla, where the major

focus has been on developing and strengthening systems, has started showing positive results. With an investment of Rs 1,729,200, the farmers were able to generate an income of Rs 10,908,421, which is six times more than the total investment by the farmers. At the same time, a cadre of entrepreneurs has been developed within the cluster with the prime objective for establishing a robust system of marketing, which will help the farmers gain maximum price for their products. Such an intervention can help in developing agriculture-based clusters across the regions and farmers will have access to markets, where they will be able to fetch respectable prices for their products.