

STUDY ON EXPERIENCE OF DIVERSIFICATION OF AGRICULTURE TO HIGH VALUE CROPS WITH SMALL HOLDERS IN THE CENTRAL INDIAN TRIBAL BELT

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Abstract

Agriculture in the Central Indian tribal belt is mostly rainfed with high dependence on cereal crops like paddy and maize. With increasing population, the small, dispersed parcels of land are further reducing in the region. In this context, several initiatives for high income for farmers from plots of land that are less than 0.5 acres through promotion of short duration higher value crops have been done, including floriculture, vegetables and spices. While investments for such diversification are increasing, particularly through large state sponsored vegetable promotion programmes in tribal areas, there is limited understanding about appropriateness, sustainability, adoption and continuation by poorer farmers. The study has been designed as a source of learning for practitioners and policy makers for improved programme design.

The study is being conducted in twelve locations across central Indian tribal belt. The methodology includes capturing extensive data from promoting civil society organisations at stages of incubation, piloting and up scaling. It studies early adopters, late adopters, non-adopters and dropouts in terms of factors facilitating their participation in the programme. This together with cost economics at different stages of programme, will give insights for better design of programmes.

The study would bring specific inputs into design of projects for commercial vegetable promotion and floriculture. It will distill experiences on enabling factors and duration of investment required at different stages of programme growth. This document will therefore be useful to practitioners for understanding success and bottlenecks while implementing such interventions.

Introduction

Poverty in India is now mostly a rural and regional phenomenon, with three-fourths of the poor living in villages, and over two-thirds of them in the central Indian plateau, which houses 75% of India's tribal populations and is also called the Central Indian Tribal belt³. Poverty still has sharp social and occupational etchings - about half the tribal people nationally are below the poverty. They either have no productive assets, or have natural resources embedded in complex ecologies – the undulating, hilly and mountainous regions in contrast to the fertile and easy to manage plains and deltas; and they inhabit regions with weak institutions, including poorly developed markets and weak governance. Agriculture is a key source of livelihoods in these areas, supplemented by gathering from forests and wage earnings, often through distress migration. Agriculture in the region is mostly rainfed with high dependence on cereal crops like paddy and maize. Even in these crops, there are large productivity gaps of upto 100%⁴ as in the case of maize in western parts of the region. Most development interventions have a focus on stabilizing cereal crops with small-scale vegetable promotion for food security. With increasing population, the small, dispersed parcels of land are further reducing in the region⁵. In this context, there have also been several initiatives on promotion of short duration higher value crops such as floriculture, vegetables and spices, which yield high income for farmers from plots of land that,

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³ Central Indian tribal belt comprises of over 900 development blocks which have more than 20% tribal population. 72% of these blocks have a poverty head count ratio of more than 50%.

⁴ ICRISAT

⁵ By 2026, 21% of agriculture land is expected to be held by 63% of landowners in Jharkhand with average land size of 0.4 ha. Quoted from project on strategic Plan for Extending Green Revolution for Eastern India, Department of Agriculture and Cane Development, Government of Jharkhand in unpublished study of CInI on Water, Poverty and Livelihoods in Jharkhand

are less than 0.5 acres. While investments for such diversification are increasing, particularly through large state sponsored vegetable promotion programmes in tribal areas, there is very limited understanding about appropriateness, sustainability, adoption and continuation by poorer farmers. A situational analysis on these factors would be a source of learning for practitioners and policy makers for improved programme design.

Methodology

The methodology includes study of 12 programme locations, working successfully for at least five years, across the central Indian tribal belt. The study is currently underway, with 50% of the planned sites already being covered.

The framework of the study in terms of specific probing points was developed in one location. Data was taken, using a semi structured questionnaire, from the promoting civil society organization on their interventions at stages of incubation, piloting and up scaling of the interventions. Team of two professionals each visited 11 other sites, using this framework of the study, to interview 20 farmers selected from across categories of early adopters, late adopters, non-adopters and dropouts from the programme

The locations under the study are as follows:

| Location | | |
|----------------|----------------|--|
| State | Districts | Cases |
| Maharashtra | Jawahar, Thane | Floriculture |
| Maharashtra | Nasik | Vegetable cultivation |
| Gujarat | Valsad | Creper based vegetable, Floriculture, Mango Grafting |
| Gujarat | Dahod | Floriculture, Trellis based vegetable promotion |
| Rajasthan | Udaipur | Vegetable cultivation |
| Madhya Pradesh | Badwani | Papaya, Caster |
| Orissa | Rayagda | Vegetable cultivation |
| Jharkhand | Gumla | Vegetable Cultivation |
| Jharkhand | Ranchi | Market led vegetable cultivation |

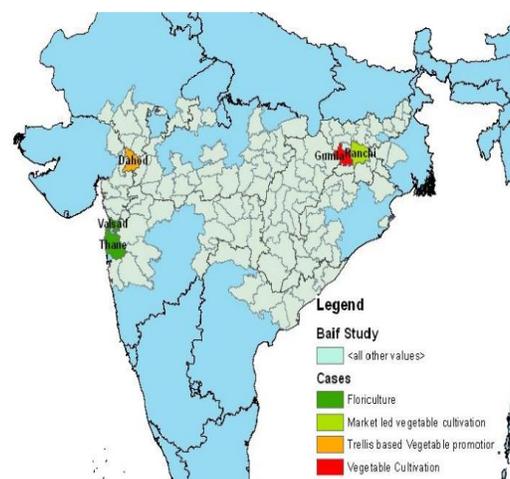


Table: Location planned for study

Fig: location where study is completed

Salient features of locations where study has been completed are as follows:

| Salient features | Gumla, Jharkhand | Rangamati, Jharkhand | Dahod, Gujarat | Jawahar, Maharashtra |
|---------------------------------|---|---|---|---|
| Geography and topography | Southern part of the Chota Nagpur plateau which forms the eastern edge of the Deccan plateau system. Highly Undulating topography | Located in the Chota Nagpur plateau Plain Topography | This district is at the trijunction of states of Madhya Pradesh and Rajasthan. Undulating and sloppy | Jawahar & Vikaramgarh region of Thane district (Maharashtra) Undulating and Sloppy |
| Climatic conditions | Sub-Tropical climate with annual rainfall of about 1450 mm. | Sub-Tropical climate with annual rainfall of about 1450 mm. | Usually hot climate, rain fed area with average rainfall of 739 mm. | Tropical wet-dry monsoon climate with average rainfall of 2000 mm |
| Demography⁶ | Males 52% and females 48%, | - | Sex ratio of 986 females for every 1000 males, 91% | Males constitute 53% of and females 47%, 93.57% |

⁶ Census of India 2011

| | | | | |
|---|---|---|--|---|
| | 68 % tribals, Literacy rate of 75% | | tribals. Literacy rate of 60.6% | Tribals. Literacy rate of 72% |
| Soil conditions | Acidic, Deficit in Boron and Zinc | Acidic, Deficit in Boron and Zinc | Hilly light soils | Stony and sandy loam soils |
| Access to roads, markets | Pitch roads making inroads in villages. Accessibility to three major markets | Adjacent to National Highway connecting cities like Kolkatta, Patna, Jamshedpur | Well-connected roads from villages to Dahod city centre and other Blocks. Dahod is also well connected with cities like Vadodara and Ahmedabad through Roads and Rail. | Well connected roads to Mumbai city |
| Livelihood patterns | Agriculture and forest produce are the major livelihood sources, followed by mining | Predominantly agriculturists | Agriculture and Forest produce are the major livelihood options followed by income from migration | Agriculture and Forest produce are the major livelihood options followed by income from migration |
| Community organizations | 133 Self help groups | No field institutions except for Market committee | Lift Irrigation co-operatives, Self Help Groups and their federations | Cooperatives of Producers |
| Promoting Civil society organization | PRADAN | NIL | SADGURU | BAIF |

Salient features of the models under study:

Year round vegetable cultivation, Gumla, Jharkhand:

The year round vegetable cultivation model promoted by PRADAN evolved over a period of 14 years and currently reaches out to 3,000 smallholders⁷ in 40 tribal dominated villages of Gumla district. Since its inception, PRADAN had developed water resources in the area and organized the community through formation of grass root level institutions. Household food security being the primary concern, work on paddy stabilization through introduction of new variety⁸ with improved package of practice⁹ was successfully undertaken.

- ✓ Fixed crop sequencing from a crop basket identified through years of trials
- ✓ Rigorous implementation of a defined package of practices
- ✓ Land Treatment (Ca/Mg/B)
- ✓ Land selection
- ✓ Common nursery
- ✓ Healthy seedling raising
- ✓ Composting
- ✓ Field Sanitation & Bunding

Between 2004-06, PRADAN initiated vegetable cultivation to meet the enhanced the aspiration of community to earn extra income from their own farms. In the incubation phase, PRADAN started work with 500 farmers to stabilize vegetable production. Selected farmers had at least 0.1 ha of land, 2-3 labor available and some irrigation facility. The crops were selected based on extensive study and field trials on crop sequences¹⁰. This comprised tomato and chilly during rainy season, cauliflower, pea and cabbage in winter and watermelon, cucumber and bittergourd in summer months. All the crops selected had varietal trials, and defined package of practice developed specific to the local context. In the piloting phase almost 1,500 farmers participated. Initially farmers sold their produce within a 15 km radius.

⁷ Average landholding size is 1.6 ha, Baseline survey of SRTT Aided Livelihood Promotion Project

⁸ Swanasampada, Lalat, both are high yielding varieties which were promoted by PRADAN in the area

⁹ Package of practices include seed sorting and treatment, nursery raising, transplantation within 12-15 days, weeding twice, using cono-weeder.

¹⁰ Crops are selected through a value chain study of each crops, where in the seasonality of demand, the quality of product and other competing markets

Increasing production could not be absorbed in the local market leading to the setting up of agriculture co-operative. All farmers brought produce at one place where one trader from a distant market provided better price. Till 2008, this arrangement prevailed. However issues regarding quality of produce, transparency and participation of community in marketing remained. Also, a competing interplay with local market led to price anomalies. Linkages reduced supply in local market thereby increasing price and creating incentive structure for members to sell in the local market rather than to the co-operative. This linkage was largely facilitated and intermediated by the promoting organization. With increasing demand, local input markets were also stimulated and material was available locally.

PRADAN after these initial experiences arrived at the concept of Agriculture production clusters, which would be market oriented clusters on pre - identified crop sequences with scale to reach outside the local market. Towards this, and to ensure quality, common nursery was made. Field supervisors were trained to ensure all practices with farmers. Input procurement was still coordinated but through smaller self help groups and farmer groups. Marketing agents were promoted who would contact various traders and negotiate price at harvest time earning between Rs 5-15,000. The farmers brought their produce at the collection point where payments were made after initial sorting and grading. Marketing agents are enthusiastic youth of the village, interested in earning extra income during the agriculture season. In the up scaling phase, almost 3,000 members are part of the venture, working in the concept of agriculture production clusters. The entire operation from input procurement to marketing of produce is managed by the community through a linkage with the market. PRADAN continues to provide planning support and technical inputs. Current income of the participating households is Rs. 40,000, (751 USD), 80% more than that at the baseline¹¹. Vegetable cultivation today contributes over 50% to the overall income of participating households. The average area under agriculture also increased from .06 ha to .1 ha¹².

The programme subsidised at the household level only in initial years, with about 50% of the cost being underwritten through project support. It has however mobilized, over a decade, investments of Rs.20 million (384,615 USD) through various state programmes for infrastructure including grading centres and development of water resources.

Floriculture, Jawahar, Maharashtra:

BAIF started work in Jawahar area in 2003 through promotion of 'wadi' model¹³ with tribal households¹⁴.

While this model established an approach of long-term asset creation for households, there was a need felt within BAIF to work on shorter gestation higher value crops. Floriculture was identified as a possibility and its incubation initiated in 2005 with 30 farmers. The programme now reaches out to over 2,000 households in the

- ✓ Floriculture: Jasmine (*Jasminum sambac*)
- ✓ Planting month: June to December,
- ✓ Propagation: stem cutting, plants/500 sq m: 217
- ✓ Land preparation: ridges and furrows,
- ✓ Spacing: 5ft, aftercare: pruning and earthing up,
- ✓ Fixed dose of manure and fertilizer plant protection measures
- ✓ Land size: 0.10 acres

¹¹ Household interviews as part of field study

¹² Household interviews as part of field study

¹³ An Agro- horti forestry plot in a 0.4 ha of undulating hilly slope, has 60 fruit trees within and fodder plants in the boundary.

¹⁴ The average land holding size per household is around 1.2 ha

region. Initial farmers were selected based on their interest and taken for an exposure visit to nearby farms. Jasmine was identified, as it was a hardy perennial crop that can grow in poor quality of soil and has demand in both local and distant markets. Keeping in mind the risk bearing capacity of the tribal farmers, BAIF developed a model of 135-217 plants in 500 sq m of upland. While irrigation was preferable, they did not limit farmer selection to those having irrigation facility. Initially farmers were given input support in form of planting material, fertilizers and technical support. The focus was to create initial successful demonstrations for motivating more farmers into the initiative. In the piloting phase focused exposure to markets was given. Marketing was done at individual level in the local and nearby markets. While the crop selection was done keeping in mind the Mumbai market, effort was made to reach that market only when there were issues in returns and timeliness of payment by vendors in the nearby market. An informal flower grower collective was formed in order to tap distant market of Mumbai after exposure of ten leading farmers to the market and developing a linkage with a credible trader in the market. Hamlet level collection centers were formed with farmers picking their produce at 4 am and bringing them to collection centres. These flowers through collection centres are aggregated and transported by a marketing agent to the market. The agent is paid a fixed salary. Simple systems for tracking of quantity contributed by each farmer and price realised were established. A fixed salary to the agent besides travel costs are covered by the collective. During up scaling, convergence with tribal development department on floriculture promotion, besides linkage with irrigation department helped in increasing the outreach.

The total income for 2,000 households in the financial year 2011-12 is around Rs. 22 million (418,540 USD) from five clusters of the cooperative. The average income earned has increased from Rs. 70/kg to Rs. 160/kg. Households now earn around Rs 25,000 (480 USD) to Rs 32,000 (615 USD) from two seasons annually, accounting to about 33% of total income. Floriculture is a highly labor intensive crop, a household having at least 5 members can manage about 300 plants including daily picking at an early hour, frequent irrigation and seasonal after care activities.

BAIF now focuses on capacity building of the cooperative, through providing technical trainings, strengthening of system, encouraging fixed quality control measures at different stages of plant. Much attention is on convergence with water resource development for ensuring water availability in summer months.

Floriculture based intervention were tried out in various other locations in Nandurbar in Maharashtra and Kaprada in Gujarat, which were not as successful. The major reason identified were lack of proper market study prior to implementation leading to selection of inappropriate varieties. Size of plots were small and return from the model insignificant to collectivize. Besides successful demonstration of crop did not happen, which affected new participants from joining the intervention. In villages such as Dongarpara in Jawahar, it was seen that potential households do undertake the activity over a period of time. Those not taking up either do not have the resource i.e. are landless or have other sources of income such as salaried employment. Interestingly many of the early adopters did not have ready access to irrigation. This substantiates the view that aspiration of the household – both men and women- is critical for the household to successfully venture into floriculture.

Creeper based vegetable cultivation, Dahod, Gujarat:

Sadguru Foundation initiated its work in the rain fed region at the tri-junction of Madhya Pradesh, Gujarat and Rajasthan in 1976 through promoting lift irrigation schemes. The work on low cost trellis promotion in few villages was initiated in 2006. This intervention therefore rides on years of experience and rapport developed by the organization in the region.

Seeing the initial success, trellis promotion was adopted within the state run programme for tribal development ¹⁵, making funds available for reaching out to 3,000 households across 40 villages in the area. Trellis cultivation is usually done by small farmers, who have an average of 2 ha. land with some source of irrigation and some experience on vegetable cultivation.

- ✓ Area: maximum .10 ha
- ✓ Pole length: 100, Wire length: 100 kgs
- ✓ Spacing: 2x2 m
- ✓ Land preparation: ploughing for three to four times, followed by planking
- ✓ Crop cycle: Seasonal (six Months) /perennial
- ✓ Irrigation

At least two adults are required for doing required labour operations.

The model is .10 hectare of land in which cement stakes support wire for creeper plants. The initial capital cost of the model is Rs. 26,000, of which the participating household contributes Rs 3,000. The net profit from the model in six months is Rs 22,000. An additional income of Rs. 15,000 is generated from growing a lower tier of vegetables such as coriander and garlic. The creeper crops grown are mostly sponge gourd, pointed gourd and bitter gourd.

As the model relies on demand by the community, there is a pre existing level of awareness and access to resources to enable successful implementation. Due to good income from the model, the dropout rate of the model is less than 5%.¹⁶ The success of the programme can be seen by the increased number of farmers using locally available bamboo and initiating trellis farming.

The input procurement in form of seeds and fertilizers are done individually; however, Organization has initiated a strategy for collectivization of input supply through Women horticulture cooperative. There is ready access to market. However, to avoid a glut and for catching right price, farmers have initiated a system of alternating their market days.

Vegetable Market, Rangamati, Ranchi, Jharkhand

Rangamati lies on the National Highway 33, which connects two big cities of Jharkhand and further links to Patna (capital of Bihar) and Kolkatta (capital of West Bengal). Till mid 70's Rangamati like any other village of Jharkhand, hosted 'weekly haat', where buyers and sellers used to confluence and barter their products. The regular market came into existence after 70's when the National highway was constructed, followed by an initiative by local people to invite local traders from Ranchi and in return give them protection to do business. With the market gradually stabilizing, more and more families started to produce vegetables, and currently the marketshed of Rangamati is more than 100 villages in radius of 25 kms. The market started as a single commodity market and is now a year round market, except two months in summer. Major commodities are cucumber in rainy season, Tomato and lablab beans in winter, Okra in summer. The market has wholesalers from Patna, Kolkatta, Bhubaneswar and sometimes Delhi. In the peak season, approximately 100 buyers are present in the market. As the market grew, so did the shops selling agriculture input.

The farmer decides who to sell his produce. Quick grading is done on unloading of the produce, which is subsequently weighed by the farmer himself/herself. Payment is made based on prevailing price. As there are many sellers, there is no cartelization of sellers. The entire business gets over within four

¹⁵ Vanbandhu Kalyan Yojana', is the core tribal development programme of the Government of Gujarat (www.vanbandhukalyanyojana.gujarat.gov.in).

¹⁶ source of data: data sheet maintained by Sadguru.

hours. Produce is re-graded, packed and dispatched to different markets. For each truck load a fixed amount is charged by the market committee, which is run by the villagers.

A village typically has heterogeneous community comprising settled agriculturists and tribals. Almost all households in the proximity to the market, produce vegetables. The land under paddy has declined, with production focused only on meeting family consumption needs. On an average a family earns approximately Rs. 80,000 (1538 USD) to Rs 1,00,000 (1923 USD) annually from sale of vegetables. Vegetable cultivation engages meaningfully most members of the participating households thereby reducing migration. This self propelled model has led to promotion of various seeds and inputs suppliers.

The early adopters were the agriculture community (Mahatos) who played an important role in stabilizing the market. Thereafter, other tribal communities seeing an assured return of their produce started to participate in vegetable production.

Results:¹⁷

The early result of the study re-emphasises the potential of short gestation, high value agriculture in bringing significant returns to small holder farmers in a challenged regions such as the Central Indian tribal belt. The models studied were consistently contributing 56% of income on an average to the household. Each of these models took over ten years to reach from a pilot to incubation to upscaling stage. It was largely seen that households having addressed their basic food security needs are more likely to endeavor into high value cropping. Organizations had adopted various well-implemented strategies for addressing food security issue before intervening into high value cropping. This had established their credibility in the region, even if it were not directly with the participating households. Support from a credible organization also was a facilitating factor enabling the participating households to take risk. While the aspect of late adoption needs to be explored in greater detail, our early results show that many households get further catalyzed by seeing concrete results and enabling conditions such as investments in irrigation development. Aspiration or state of being is a function of the households ability to envision a different future for itself. Successful models have catalysed this critical factor through systematic capacity building and exposure visits. Strong continuing focus at different phases on **capacity building** at various levels could be seen through all programmes. While in Gumla and Dahod, farmers were taken for exposure visits at different stages of crop cycle, farmers of Jawahar were part of the all market studies.

Initial cost of technology needs to be less for replication by many, this was evident in three cases (except Trellis) where average cost comes around Rs 2,500 (exclusive of the size of plot). Investments from mainstream for facilitating factors such as irrigation infrastructure and grading centres **were also critical for scaling up. The robustness of the technology to assure steady significant returns to create substantial income at the household level is essential.**

Labour available at household level is an opportunity cost, which calculated forms 39% of overall investment.

Access to market for procurement of inputs and assurance on sale of outputs is one of the major points, because of which more small scale producers take risk. For example in Gumla, Jawahar and as initiated in Dahod, there is an assurance of quality input at the door step of the farmer. Systems for good quality inputs to the farmers were established particularly in the initial stages of the programme through collectivization or even project based supply of critical inputs. The availability to access timely credit is

¹⁷ Annexure 1 gives summary of the factors as evidenced against the study framework

another factor which helps farmer to take the crops. As scale of production increased, this created a local demand for inputs.

And while selling, in all the cases, including Rangamati, there is assurance of produce been sold. Transparency in the marketing process and creation of necessary systems for catching the right price was an enabling factor for up scaling. Each programme established decentralized linkages with market players enabling deeper understanding of market dynamics and bringing of new ideas. In Rangamati the major force was market, where farmers were educated mainly in the input shops and by the seed companies, who promoted demonstrations of technologies in the villages.

The three factors i.e. availability of irrigation; availability of labor and aspiration of the household seem to be factors for success of high valule agriculture at the household level. These factors were very visible in case of sustained adopters of the model. Risk mitigation measures through the models were very much pertinent in all cases, for example, bulk procurement in case of all (except Rangamati) reduced risk of uncertainty of inputs which small farmers face during the time of need, the timeliness of catching the market (e.g. Gumla, Jawahar), though collective effort reduces the risk of glut in market.

At the level of promoter organisations, the study highlights the importance of perseverant effort, using creatively subsidies available from mainstream and working through challenges with a learning orientation at each stage of the programme. A strong emphasis on decentralized systems that put communities in the centre can also be seen in each case.

The study is underway in seven other sites across the region. Key elements that influence adoption require closer deliberation with participating organisations. The lessons drawn from the study will be used as reference for developing model for the region.

Annexure 1: Evaluation of data from each model against study framework

| SL.No. | Probing Points | Rangamati | Gumla | Dahod | Jawahar |
|--------|--|----------------------------------|--|---|---|
| 1 | Triggering factor | | | | |
| i) | The model is part of the larger context of the organizations work over few years. | Not relevant | Strongly relevant (14 years) | Strongly relevant (14 years) | Strongly relevant (10 years) |
| ii) | At community level: the model is already undertaken by progressive farmers/ community, which itself is a natural trigger . | Strongly relevant | Not relevant | Not relevant | Strongly relevant (farmer has work as labour in floriculture farms) |
| 2 | There has been a strategy of the organization for engaging the families ; The strategy might have evolved/changed as the time progresses. | Not relevant | Strongly relevant (defined POP, group nursery, timely credit available, water resource dev.) | relevant (change of model, supervisor available for technical inputs) | Strongly relevant (Hands on training ,Exposure visits to plots and markets, Printed notes on best practices) |
| 3 | Those households who have risk absorption resources and are most likely food secure and are the one who initially | Strongly relevant (food secured, | Strongly relevant (food secured) | Strongly relevant (water through Lift increased cropping intensity and food | Strongly relevant |

| | | | | | |
|---|---|---|---|---|--|
| | take up the model. | agriculturists) | | security) | |
| 4 | Household Labour should be enough for working on the land based model. | Strongly relevant (average 5 labor available) | Strongly relevant (Community driven system in times of need) | Strongly relevant (average 6 labor available) | Strongly relevant (one hours in early morning four family member can harvest minimum 2 kg) |
| 5 | Access to market for procurement of inputs and assurance on the sale of outputs. Creation of necessary systems for catching the right price. | Strongly relevant | Strongly relevant (Value chain analysis, ,APC) | Relevant (coordination between Villages for organizing sale, organized procurement) | Strongly relevant (Planting material prepare by farmer and sell , other inputs fertilizer ,plant protection measures are available in agriculture service center, sell through cooperative) |
| 6 | Low start up cost, lesser external investments therefore faster replication and up scaling | Strongly relevant (Rs 2000 for .33 acre) | Strongly relevant (Rs 2000 for two seasons for .30 acres) | not relevant (High initial cost, subsidized) | Strongly relevant (Rs. 3000 /- for .50 ha) |
| 7 | Focus on capacity building of the models participants | Not relevant | Strongly relevant (Community Service Provider training, exposure visit) | Relevant (Exposure oriented not very structured) | Strongly relevant |
| 8 | The promoting organization is open to new ideas / intervention and hence there is refinement of existing interventions with time (for that model) | Strongly relevant (change in seed variety every 3 years, increase in crop basket) | Strongly relevant (change in marketing strategy, transfer of responsibility to community) | Strongly relevant (Farmer initiative) | Strongly relevant (increased no. of plants in model) |
| 9 | The return from the model is significant and reliable which leads to adoption by many. | Strongly relevant (80% of total income from the model) | Strongly relevant (50% of total income) | Strongly relevant (60% of income) | Strongly relevant (First year Rs.24200 and Second year 32000, forms 40% of overall income) |

| | | | | | |
|----|--|---|--|---|-------------------|
| 10 | The risks associated with the model are preempted and sufficient mitigation steps are taken to minimize it. | Not relevant | Strongly relevant (Not preempted, quality input : preproduction, Production: pop, marketing: APC) | Strongly relevant(Production: selection of variety, water resource development, cement pole, marketing: alternate day sale) | Strongly relevant |
| 11 | There is a need to look into the three factors i.e. water, labor and aspiration of the individual together for analyzing the success of the intervention. | Strongly relevant | Strongly relevant | Strongly relevant | Strongly relevant |
| 12 | There is a transparency in the operation of the model | Strongly relevant (transparent market system) | Strongly relevant (Input procurement and marketing ,price known to everyone, cadre of people built who have access to market) | Strongly relevant (mainly marketing) | Strongly relevant |

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