

DOCC PROJECT REPORT



COMMUNITY DEVELOPMENT CENTRE BALAGHAT

GENERATION OF SUSTAINABLE LIVELIHOOD
BY

DEVELOPING MARKET LINKAGES FOR SALE OF POTATO, GINGER AND TURMERIC

SUBMITTED BY:

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PREFACE

SPJIMR is an institute of unique pedagogy, which involves a mix of western efficiency and eastern ethos. In the unique experience offered by SPJIMR, it has always focussed on the way of 'learning by doing'. Development of Corporate Citizenship (DOCC) is one such unique pedagogic initiative where PGDM students in SPJIMR are required to work and collaborate in a rural setting in an NGO. The objective of such a program is to subject future managers to work in an unstructured environment, sensitise to the rural parts of India and learn to give back to this society, which has made us what we are today. Thus with this motto of social awareness and managerial responsibility, DOCC has successfully been a feather in SPJIMR's cap for every year since its inception

As part of SPJIMR PGDM 2014-2016 batch, I am deeply honoured to work with Community Development Centre, an organisation that has pioneered ground level changes in the forest areas of Kanha Tiger Reserve.

My project involves developing market linkages in and around the village of Garhi for farmers to sell Potato, Ginger and Turmeric in local markets, leading to generation of sustainable livelihood for these forest dependent tribes. The project aims to work for farmers in 19 villages around Garhi in Baihar block of Balaghat district and aims to reach out to markets of Garhi, Baihar, Balaghat, Sijhora, Bichhiya and Mandla.

In this report I have accounted my findings and experiences and based on that I have given recommendations for reaching out to the abovementioned markets. I sincerely hope my work will help CDC achieve the desired outcome and will benefit the farmers with a better future.



ACKNOWLEDGEMENT

I begin my acknowledgements by thanking the **Development of Corporate Citizenship(DOCC)** office for providing us this opportunity to work in a rural setting and develop our skills as manager. This project wouldn't have been possible without their support and guidance.

Next, I thank **Community Development Centre (CDC)** for allowing me to work on this project and giving me a perspective into the work of farmers. Within CDC, I take honour in thanking my project coordinator **Sh. Ameen Charles**, founding member and Vice President of CDC for guiding me during the course of the project. He has been the guiding light for me in understanding the farmers without getting lost in too many problems that would have led us to deviate from the project. I would also like to thank him for giving me the freedom and motivation to choose the course of the project and the methods to achieve the milestones. This gave me an entrepreneurial spark to drive this project to its desired outcome.

I would also like to thank all the **volunteers of CDC** in Balaghat and Garhi namely Mr. Mahesh Chourasia, Mr. Mahesh Dahate, Mr. Komal, Mr. Praveen, Mr. Pancham for making my stay and work smooth and comfortable and also giving me inputs of ground level realities. I would also like to thank the women SHG for making arrangements of food during my stay here.

A mentor is always necessary to help you gain vision. On this note, I take the opportunity to thank **Dr. K.G Karmakar** for being my faculty guide. My conversations with him have provided me useful inputs for carrying on my conduct in that region of the country. Also, my methodologies and ways of approaching people are heavily influenced by Karmakar sir.

I would like to thank our **Dr. M.L Shrikant** for envisioning the and incorporating DOCC into the pedagogy of SPJIMR. I would also like to thank our Director Dr. Shesha Iyer for being a great leader for the institution.

Lastly, I would like to thank **Dr. Nirja Mattoo, Chairperson C-DOCC**, for not just making DOCC a memorable experience for every PGDM batch and for batches to come but also maintaining the integrity and standards of DOCC at the highest echelons and for keeping its intentions noblest.

I wish all the very best to CDC, Balaghat and DOCC, SPJIMR

Thank you

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EXECUTIVE SUMMARY

Community Development Centre (CDC) is headquartered in Balaghat and works at ground level for the forest dependent tribes and the villages around the Kanha Tiger Reserve. In this project, CDC aims to achieve a source of sustainable livelihood for forest dependent communities. It aims to train them for growing cash crops like potato, ginger and turmeric and sell them in market for income generation.

My project is to establish market linkages for sale of potato, ginger and turmeric in local markets around Garhi in Baihar block of Balaghat.

The project begins by assessment of farm potential where farm visits were conducted to get an insight into the maximum quantity the farmers can produce. Interviews with farmers and community revealed that the farmers have the ability to produce 20 quintals of potato in the designated cultivation area. A survey of a sample of 46 of these farmers was conducted to get data on their inputs and farm outputs. Based on the data the farm output potential was assessed at 6063 quintals for these 150 project beneficiaries at current productivity levels.

Next, the markets around Garhi village were identified to be the *Mandi* of Garhi, Baihar and Balaghat in Balaghat districts and those of Sijhora, Bichhiya and Mandla in Mandla district. The demand assessment in each market was done.

Next, the existing supply chains were identified and the dominance of wholesalers was observed in these. The conditions of farming in existing areas and those of Garhi were compared and their differences of scale were noted. This drove the conclusion that the need for wholesaler in market linkage for Garhi farmers can be eliminated.

The supply chain for potato, ginger and turmeric was identified in each market. For this a Porter's Five Forces analysis identified the role of competitors and complementers to be dominant. A SWOT analysis for done to identify the reasons for the farmers to tap these markets.

The market actors for each supply chain link were identified. Mr. Shakir and Mr. Ramesh was identified for selling potato and ginger respectively in Garhi and Baihar markets. Mr Shakir had its own transport and for Mr. Ramesh, Agrawal Transport was identified as the logistic link. For Balaghat the list of commission agents was prepared and two agents with lowest commission are selected. These can be supplied through Agrawal Transport itself who backhauls other material, thereby reducing transport costs. Packaging material supplier was identified too. Same was done for Mandla.

A detailed operation plan for executing the supply chain involved activities for taking the output from Farms to a Community Collection Centre (CCC), managing the CCC, coordinating with agents and transporters for loading and unloading material and collection and disbursement of payments.

Lastly, challenges can halt the project and need strategic intervention for mitigation.

CHAPTER 1

INTRODUCTION

Kanha Tiger Reserve: An inspiration to Great Tales

Kanha Tiger Reserve is considered to be one of the finest wildlife areas in the world. It is an invaluable treasure of wilderness and well preserve by the government of India. Situated in the Maikal Range of Satpuras, the landscape of Kanha Tiger Reserve forms a stunning combination of dense forests, open meadows, wooded mountain slopes and lakes and rivers with crystal clear water. A month spent in these reserves made me understand why it was such an inspiration to famous authors like Rudyard Kipling to write great tales like the Jungle Book.

History

Kanha is one of the oldest wildlife sanctuaries in India. It was declared a Reserve Forest in 1879 and granted Wildlife Sanctuary status in 1933. At that time, it was divided into two parts- Hallol and Banjar. On June 1 1955, Kanha was notified as a National Park. Finally, in the year 1973, it got the status of the Tiger Reserve.

Location

Kanha Tiger Reserve is located in a horseshoe shaped valley of the Maikal Range of Satpura Mountains. It spreads over Balaghat and Mandla districts of Madhya Pradesh. Off the 1967 square kilometres of total area, the core area extends upto 940 square kilometres and the rest is buffer area, amounting to 1027 square kilometres.



Fig.1 Map of Kanha Tiger Reserve – Core and Buffer Zone

Wildlife

Famous for its rich wildlife, Kanha is a home to approximately 131 Royal Bengal Tigers, one of the highest numbers in India. It is also a refuge and a last world to the Hard Ground Deer or the Barasingha. Kana has played an instrumental role in preservation of this rare species too.

Other wildlife includes predators like leopards, wild dogs and sloth bear, herbivores like gaur and chital, scavengers such as hyena and jackal and small mammals like porcupine, wild hare and mongoose.

Flora

Kanha has forests as well as grasslands. Forests are located in an undulating terrain and has continuous forest cover. The area is heavily forested and comprises of mixed forests, which are dominated by Sal and bamboo. The forests are ranging from pure sal to pure bamboo forests which are valued for their wood. Trees like Jamun and Mahua and many more are known for their medicinal value, cosmetic value and as a source of food. As it is a mixed forest, there are lots of species of Non Timber Forest Products (NTFPs). Some of the main ones are Harra, Bahera, Amla, Lac, Tendu leaves, Mohul leaves and Honey. The grasslands, on the other hand are formed after local tribes, who clear a small patches of forests for temporary settlement, move on to new clearings thereby leaving gaps in the forest cover.

Tribes of Kanha Tiger Reserve

BAIGAS

The Baigas consider themselves to be servant of the earth and the king of the forests. Systematic Baiga villages came into existence much later. Earlier, they used to practice shifting cultivation without using the plough by clearing forests. After some year, they used to shift to some other nearby area. Even today, the forests are the first love and choice of the Baigas. They survive largely by hunting and gathering honey, herbs, gum, flowers and fruits from the forests. Some of the main ones are Harra, Bahera, Amla, Lac, Tendu leaves, Mohul leaves and Honey. They have remarkable knowledge of animals and plants.

GONDS

Kanha was originally the “Land of Gonds” or Gondwana. Gonds are large in numbers here. They practice shifting agriculture and worship nature, village deities and ancestors. Their livelihood is dependent on rain-fed agriculture, agriculture labor and Non-Timber Forest Products (NTFP). They primarily cultivate paddy and wheat on small landholdings. They sell their yield in local markets.

Wildlife Conservation - Project Tiger

Launched on April 1 1973, Project Tiger was the most significant move in the history of wildlife conservation in India. The objective of Project Tiger is to revive Tiger population in India. The salient initiatives of Project Tiger include:

- Division of forests into two zones:
 - A disturbance free area called Core Zone, which is relieved from biotic disturbances and forestry operations like grazing, human disturbance, collection of minor forest produce, commercial activities etc. At the same time if there is any village lies in that area, seek for relocation of such villages to distant place
 - Adjoining areas called Buffer Zone, to provide habitat supplement to over population of wild animals, grazing to adjoining village cattle, for commercial wildlife resorts, settlement of relocated villages etc.

- Forced evictions: Conservation officials blame the villages in and surrounding the National Parks to be the chief reason for dwindling habitat condition of forests. As a result, villages in the core area are forced to evict and relocate in the buffer area
- Coordination from villagers: The project seeks help of villagers in various labor intensive activities like maintaining forest tracks, patrolling, tiger tracking, forest guarding etc
- Strict Punishment norms: Amendment of the wild Life (protection) Act, 1972 for providing enabling provisions for constitution of the National Tiger Conservation Authority and the Tiger and other Endangered Species Crime Control Bureau. The punishment in cases of offence within a tiger reserve has been enhanced. The Act also provides for forfeiture of any equipment, vehicle or weapon that has been used for committing any wild life offence.

The Cost of Wildlife Conservation

A. Loss of Livelihood

Since the enforcement of Forest Protection act and provisions under Project Tiger, there has been total prohibition on any kind of activity to be conducted within the core zone and many activities in the buffer zone of the forest are too prohibited. As such, the tribal villages have been struggling for survival because:

1. Gathering NTFPs for sale and subsequent livelihood generation is legally not allowed
2. Hunting of animals for food has been banned and is punishable under law
3. Cutting of trees for timber too is illegal and punishable under law
4. Their farms are constantly under attack from wild animals. Many crops get destroyed every year due to trespassing by wild animals
5. Their cattle and poultry are under constant attack by wild animals

B. Forced Evictions:

Thousands of tribal people have been forcefully evicted from the Kanha Tiger Reserve area under the Forest Protection Act. The Forest Rights Act, a law recognising the right of indigenous tribes to inhabit the forests where their ancestors settled centuries earlier, was enacted in 2008. But some environmentalists fear it has hindered efforts to conserve wildlife and encouraged the poaching of animals such as tigers. Thus, the act was never in full vigor.

The government claims that not a single person has been evicted against their will. Till date, the official figures of consented evictions from the Kanha Tiger Reserve Area stand at 1200.

However, several agencies report the number to be at least 10 times more. For instance, in a Reuters report dated Jan 2015 it has been mentioned that around 450 families amounting to 3000 were forcefully evicted in June 2014. Threats of rampaging their settlements by releasing wild elephants on them made them surrender to the authorities and settle randomly around villages in the buffer zone.

C. No sustainable aid by government

Help was declared by the government in the form of one time compensation to relocated families ranging from Rs. 1 lac to Rs. 10 lac under the Forest Protection Act. But that was only for 1200 people. But, in reality, this help neither reached completely to the people nor was it a sustainable option.

Also the government has offered minimum wages to the tribal communities. But the Gonda and Baigas are free spirited souls and find it difficult to streamline their lives with the modern world.

The ongoing conflict

Thus, the conservation of forests came at the cost of the human settlements in and around the forests. Not only their livelihoods but the safety of their lives was in doldrums. This has often created hostility and conflict between local/tribal communities and the PA managers. In some areas, the consequences of conflict between PA managers and the local communities lead to degradation of habitat and little or no support for conservation at the local level. The root cause of conflict is in the limited availability of viable alternatives and affordable solutions to the problems faced by the local communities.

Livelihood Opportunities Available

The tribes of jungle have options to look for a new ways of sustenance outside the jungle. These include:

1. **Agriculture:** The farmers can adopt agriculture. They have experience of growing food in the jungle by smashing and burning methods. Here outside the jungle too, they can switch to grow food crops like rice and wheat in a cultivate manner as is done by other villagers in the buffer zone.
Problems in starting agriculture:
 - a. Cannot practice the slash and burn methods: The tribesmen cannot practice their own ways as it is prohibited in buffer zone.
 - b. No land ownership: The government has allotted no land to these tribesmen to practice any kind of agriculture. Many have however started farming by occupying land without legal formalities.
 - c. Lack of technical expertise: They have little knowhow of growing other crops apart from rice and wheat and few pulses.
 - d. Lack of technology: These people own bullocks and ploughs. Beyond that, they have no technological assistance. No weather forecasts by radio or Television, nor mobile internet and no government assistance centers are present to their aid.
 - e. Lack of Financial aid: In absence of any prior assets and old money, the farmers have little or nothing to invest into farming
2. Working as Farm labors: The farmers can work on daily-wage basis on farms of existing villagers. However, the existing farmers also have small scale farm and cannot employ all of them and give them sufficient wages. A few have been able to get jobs in farms by getting good quality bulls to work on the farms.
3. Practicing Handicrafts and Medicinal herbs:
The Baigas and Gonds are excellent craftsmen and use their skill to make items that can be sold in the market.
However, there is little market for such items. In addition, these people have no idea of how the markets function.
4. Migrating to cities for petty jobs:

In cities they can find jobs as carpenters, daily wage workers etc. But this option also fetches petty income and is against the dignity of these people as they have lived as men of free will, as per their whims, in the open nature.



Community development Centre also known as CDC, is registered as a non-political and non-profit organization which operates in the districts of Balaghat, Mandla and Dinodri districts of the state of Madhya Pradesh and has been working on Women, Child and youth development since its establishment in 2003.

The core working areas are livelihood, environment and health, with priority to the rights of the children. CDC has also worked with CARE on implementation of their unique project called INHP, from which the Government of Madhya Pradesh has adopted the best practices and has replicated in the other districts.

- CDC has formed VHSC in more than 20 villages, and they are functioning well.
- CDC has also formed a Women Self Help Group which comprises more than 1500 women members who have improved their livelihood through small initiatives which have been guided by CDC.
- CDC is also working for education and eradication of HIV AIDS among the female sex workers.
- The Organization has focused on education of the global warming issue among the tribals and implementation of a project in the protected forest area with the support of WWF.
- CDC, through the PACS program has empowered women and functionally educated them to be able to access the Government development programs and plans.



Fig 2. CDC and its activities

- CDC is currently to improve the living conditions of the tribals around the protected forest areas who face the cost of the forest and wild life conservation by guiding them into a sustainable alternate source of income which is focus on the farming of horticulture crops. CDC is working with these people on integration of livelihood and conservation through vegetable cultivation, NTFP processing, organic farming etc.

THE CDC INITIATIVE

Promotion of Sustainable Livelihood in Protected Areas near Kanha National Park in Balaghat District of Madhya Pradesh

CDC intervened in the villages in the protected area for identifying a sustainable livelihood for these tribal people. The project was supported by Department of Science and Technology and by World Wide Fund for Nature. The organisation introduced sustainable agriculture through WADI, vermi compost and vegetable cultivation.

Vegetable cultivation by the community members and subsequent sale of the vegetables in the local weekly market was the most profitable and sustainable activity identified in the project. The causal factors of the success are

1. Demand in the local market:
Markets where vegetables can be sold and their demand in each market was crucial to plan the expected yield from the farms. All the activities need to be planned according to the market demand.
2. Comparative immediate returns on investment:
The more profitable the crop the better the returns. Also, the farms being small in size required to grow crops with larger profit margins as economies of scale wouldn't be that effective.

Objective

The objective is to provide a sustainable livelihood security to the farmers located in protected areas of forests. This is to be attained by working on three areas:

- Improvement of livelihood of farmers by guiding them into an alternate source of income that would integrate the livelihood and conservation. The farming of horticulture crops has been identified as a possible sustainable source of income.
- Development of market linkages for the sustainable source of income for the identified tribal families.
- Organization of the local communities to address the common issue of land rights under FRA.

Scope

Project Area: List of Gram Panchayat and Villages

The project is being implemented in 28 villages of 10 Gram Panchayats in the Baihar Block of Kanha Tiger Reserve. These are as follows:

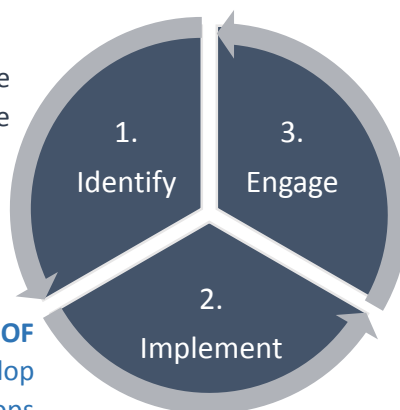
S. No.	Panchayat	Villages
1	Sijora	Khursipar, Komo, Baijalpur, Farmtola, Nunkatola, Kaliyatola
2	Jaitpuri	Jaitpuri, Juaditola
3	Kugaon	Dhaniyajor, Arandi, Kugaon
4	Ramhepur	Ramhepur
5	Pondi	Pondi, Agantara
6	Khajra	Chhinditola, Saraitola, Khajri
7	Mana	Narghutola, Lapti, Mana
8	Bhalapuri	Bhalapuri, Balgaon, Parsatola
9	Kadla	Kadla, Hirapur
10	Samariya	Bilaikhar, Samariya, Dungariya,

STRATEGY

The process of making livelihood sustainable is one of continuous improvement. It can be achieved by three major steps, which can form a self-sustaining chain.

IDENTIFY FARMERS with the adequate resources to make the cycle sustainable

Promote **FARMING OF HORTICULTURE CROPS**, develop market linkages so that the crops can be sold so as to create an earning source for farmers.



TRAIN AND ENGAGE FARMERS to run the cycle and include more members into the chain to attain economies of scale

Fig.3 Project Strategy

Identify

The project would identify and target 300 families in 28 villages in the Baihar district. The families have been identified based on the following criteria

- Appropriate land holding
- Accessibility to livelihood assets.
- Migration status

- Willingness & interest
- Geographical location

Implement

- **Promotion of horticulture crops**

The project should select the horticulture crops with the following criteria:

- higher shelf life
- Suitability of micro climatic, soil, water availability with the willingness and the interest of the farmers.
- Subject to the value chain analysis so as to add value and accessibility to wider market and possibility to attain economies of scale.

- **Development of market linkages**

The linkages to the local markets, markets of the nearby locations should also be verified and developed so that the farmers get the best price for their produce. Appropriate markets should be identified as per the quantity of the produce so as the farmers get the best price for their produce. The market linkages to the institutional buyers as also to be identified so that the farmers could sell the produce to the resorts and the hotels in the Kanha National park area.

- **Convergence with MGNREGS**

MGNREGS allows investment on individual farmer's land for promotion of agriculture. The project will develop proposals for compost pits and individual/community water harvesting storage structures so that the selected farmers are able to maximize production from horticulture crops.

Engage

- **Training and Engagement**

Train the farmers in the intricacies of the value chain so that they can help to run the chain in a better way. The farmers help in including the other non-members be the part of the value chain so that they can attain the economies of the scale. The training shall also focus on the education about the baseline survey, schemes of the horticulture department, market assessment and surveys.

OUTPUT

- 1 Baseline Survey that provides information and parameters for selection of families
- 3 Value Chain studies on identified horticulture crops
- Micro plans for 300 families
- 300 families trained in vegetable cultivation
- 300 families trained in composting, its management and use
- 300 families adopting at least one of the horticulture crops
- Linkages with retail and institutional buyers established
- Follow up on FRA claims in all the Gram Panchayats

Further, the short term and long-term outputs from the established value chain can be stated as mentioned below.

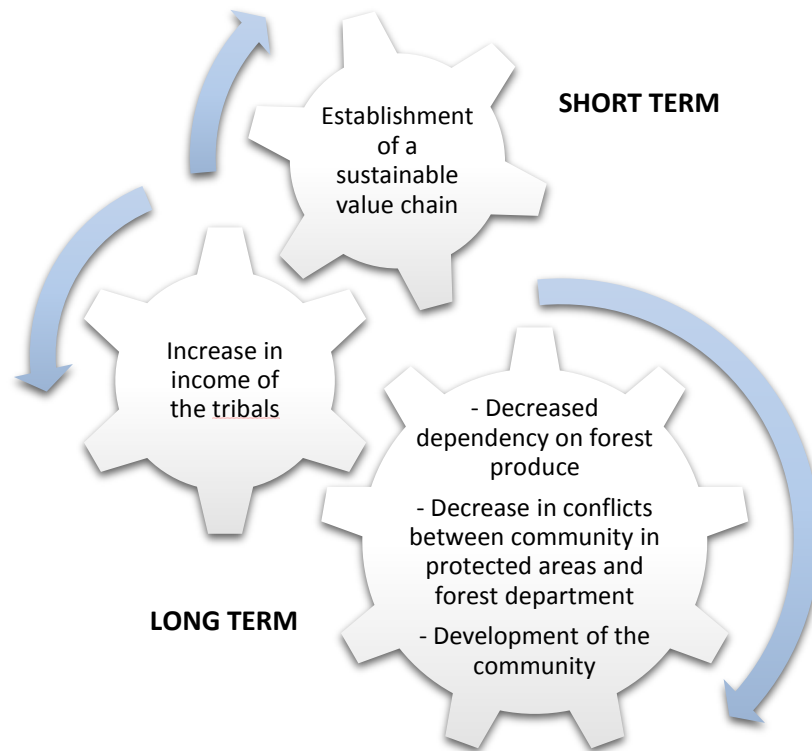


Fig.4 Short and Long term Goals of the project

CURRENT STATUS

Number of Families:

The project aims to include 300 families over the span of two years. Currently, 150 families are selected and trained for cultivating Potato, Ginger and Turmeric. After technology transfer and value chain is established, 150 families more shall be added to it.

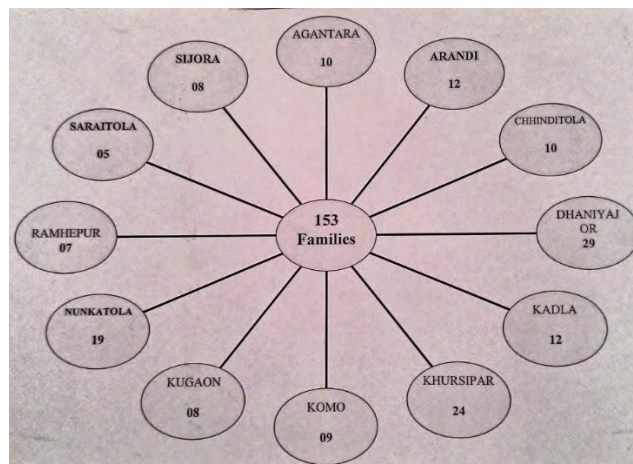


Fig 5. Number of Beneficiary Families currently under the project

Selection of Families

The project aimed to help farmers who were not as better off as the others. The criteria for this was: size of land holding; availability/accessibility to livelihood assets (e.g. water, credit etc); migration status, willingness and interest in undertaking horticulture activities. The first 150 families identified have small land holdings, migrated from the jungles and were equally interested to take the risk of sowing vegetables. A break up of these families is given below:

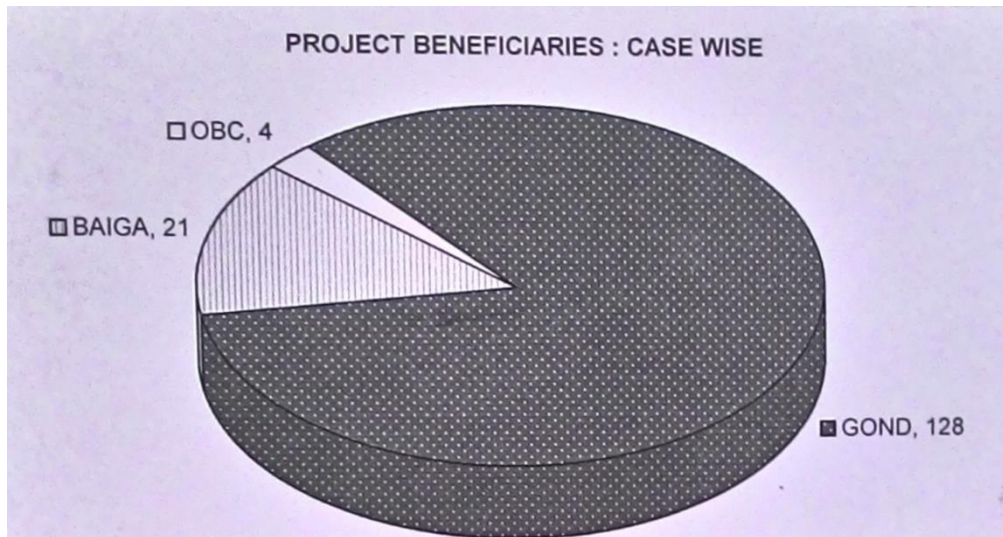


Fig 6. Demography of Project Beneficiaries

Training

Training programs on seed treatment, cultivation, processing and marketing were conducted. The agriculture and horticulture department's field staff have imparted the training. Coordinated efforts of the CDC staff and the community members have made vegetable cultivation an important income generation activity. In one year this activity generated on an average 20 man days of work thus contributing to employment generation.

CDC has also been intervening in the villages for the implementation of FRA. Claims have been registered though they are at different stages of processing, especially claims over community forest land.

Results

At present, 150 families have been taught farming of potato, arbi, ginger and turmeric. Seeds have been given to farmers at half their cost and their supervision surveys are being conducted.

A survey of 46 families was conducted to assess the output of first year.

The average farm holding has been around 4-5 acres. Currently, the entire farm is not utilised for sowing. 80% farmers are using less than 10% of their farms for sowing these horticulture crops. Most of the farmers produced potato – the pink variety. A handful of them produced ginger and turmeric.

Overall the project generated an average of 2.5 quintal of potato, 10 kgs of ginger and 15 kgs of turmeric per family in its first year.

Need for Market Linkages

Currently, the farmers are reluctant to increasing sowing area because:

1. They produce mainly for self consumption
2. They have no knowledge of how markets function and how to take their produce to the market.
3. They are clueless about how much seed they should sow.
4. They don't have sufficient money to invest in large quantities of seed.

Therefore, until the farmers sell their produce, no sustainable livelihood can be generated. Therefore, for the project to be successful, it is an imperative to establish market linkages in all possible markets for the following reasons:

- I. To avoid self-consumption:
- II. To determine the quantity of seed that can be sowed
- III. To generated revenues and thus cash flows for increasing crop yields
- IV. To become self-sustainable in the long run

CHAPTER 2

DOCC PROJECT

DEFINING THE PROJECT

Project Objective

To identify necessary market linkages in order to enable farmers to sell their horticulture output in local markets

Location

Village: 19 villages around Garhi

Tehsil: Baihar

Distict: Balaghat

Crops

Potato, Ginger and Turmeric

Approach to the Project

- A. Assessment of Farm potential
- B. Selection of Local markets
- C. Value Chain study for Vegetable Market
- D. Value Chain Design for Potato, Ginger and Turmeric in Identified markets
- E. Cost Analysis and Profitability of the Chain
- F. Operational Plan

Desired Outcome

- A. Recommendation for Supply Chain Decision with supply Chain Links
- B. Challenges, Constraints and Areas of Strategic Intervention

A. Assessment of Farm Potential:

Vegetable markets around Garhi village were of various sizes. Each vegetable market had a different demand for Potato, Ginger and Turmeric. Hence, to decide upon the number and size of markets that needed to be tapped for selling the farm produce, it was necessary to understand 'How much' can the farmers produce.

METHODOLOGY

1. Farm Visits

To assess the farm potential of the beneficiary families, it was necessary to understand how the farm proceedings go on. The kind of farming practised here would determine whether increasing the yield is technically feasible.

Farm visits were carried out to understand the status of farming practises and the scope of improvement.

Under these visits, following activities were carried out:

- a. Interaction with farmers
- b. Visiting the farm area

a. Interaction with Farmers:

The farmers in different villages were interviewed to understand their experiences and constraints. The number of farmers visited in each village are tabulated below:

The interviews were conducted to understand the mind set of farmers and also listen to their concerns towards increasing produce:

b. Visiting the farms:

The farms were visited to see the on-field conditions and see the quality of vegetables that are being grown. It also helped to understand the techniques that were used in farming and ask questions about areas where improved technology can be utilised to increase productivity

2. Calculation from survey results

A survey was conducted to know the yield vs seed sown, land area under utilization and total expenditure. The list of villages is given below:

Table 1. Beneficiaries surveyed from different villages

Village/Panchayat	Number of Beneficiaries	Beneficiaries Surveyed
Kadla,Hirapur/Kadla	12	7
Khurshipar/Sijora	23	13
Farmtola/ Sijora	8	8
Kugaon/Kugaon	8	4
Ramhepur/Ramhepur	7	7
Saraitola/Saraitola	5	5
Nunkatola/ Sijora	19	2

To calculate the farm potential, the farm output at current productivity with 100% utilization was calculated. The total yield thus calculated was taken to be the potential yield. This involves assumptions that the productivity of the farmers will be only as good as the farmer with highest productivity.

TOOLS USED:

1. Farm Visits: Interviews
2. Calculation from Survey Data: Survey of a sample and Statistical Analysis

RESULTS AND FINDINGS

1. Farm Visits

To demonstrate how interactions at the Farm went on, we describe a few sample interviews in Annexure-A. The findings of the farm visits are:

- Farmers have a potential to produce up to 20 quintals of output from their existing practices
- Farmers have primarily produced for self-consumption and have little knowledge of selling the crop
- Farmers compare their farming with those of large scale producers and thus are demotivated of their capabilities
- They face troubles in farming with irrigation, safety from wildlife and finances

2. Calculation from Survey Data (Refer APPENDIX A for Excel Sheet)

A survey of a sample of 46 farmers revealed the total produce for the year and the land utilization of farms. The survey data is attached in the Appendix.

The results from the survey reveal that:

- i. Number of Farmers: 46
- ii. Total Land Available: 176.53 acre or 17653 decimal (1 acre = 100 decimal)
- iii. Total Land under cultivation: 7.24 acre or 724 decimal
- iv. Total Quantity of Crops produced:

Table 2. summary of survey results for assessment of farm potential

Crop	Grown by # of Farmers	Total Quantity	Average per Farmer
Potato	40	9770 kg	244 kg
Arbi	43	3437 kg	80 kg
Ginger	11	94 kg	11 kg
Turmeric	12	162 kg	12 kg

- v. Total Farm Output: 13463 kgs
- vi. Average Productivity per decimal Land (e/c) : 20 kg/decimal
- vii. Standard Deviation of Productivity: 13 kg/decimal
- viii. Maximum Productivity: 300 kg/decimal (Dulan Singh Taram of Balgaon)
- ix. Land Utilization (c/b): 4% (approx.)

Assumptions:

1. With experience in growing vegetables, productivity of farmers will rise upto 2 standard deviations from current average (upto 95% confidence levels)
2. Land utilization will increase to 25% of total land used
3. The production of Arbi shall be stopped and that land be used for potato.
4. Ginger and turmeric's percentage share in total output to remain same.

Estimation of Potential Farm output:

- i. Total land area under cultivation of vegetables (25% of total land) : **44.13 acre** or 4413 decimal
- ii. Average Productivity/decimal (average+2*std.dev) : **4600 kg/acre** or 46 kg/decimal
- iii. Farm output for 46 farmers (i*ii) : 203516 kg or 2035.16 quintal
- iv. **Total Farm Potential (150 farmers) : 663639 kg or 6636.39 quintal**

B. SELECTION OF LOCAL MARKETS

METHODOLOGY

1. Identifying markets around Garhi

A list of local markets around Garhi were prepared. These markets were then visited to estimate the demand in each of them and the transportation cost

2. Demand Assessment of each market

- i. Weekly market days: These are the days when wholesalers bring their vegetables and auction them in the market. The commission agents and small vendors buy from them for selling throughout the week or just on the market day.
- ii. Interaction with sellers: Firstly, retail vendors were contacted to understand how much potato, ginger and raw turmeric do they sell per week and from whom do they procure from. Next commission agents were contacted to get from them the quantity of purchases made by them, source of procurement and their margins.

3. Selection of Market

Based on the potential farm output, the markets and quantity to be sold in each market were selected based on:

- i. Size of the Market
- ii. Distance from Garhi village
- iii. Frequency of transport
- iv. Cost of transport : Cost per unit of load, Pricing, Availability of backhaulage etc.
- v. Other Selling and Distribution costs like commission fee, packaging cost, labor cost (loading and unloading), loss of selling price due to oversupply etc.

TOOLS USED:

Market Study: Interviews with retail vendors and traders

RESULTS AND FINDINGS:

The map of Garhi area shows that the place is surrounded by forest on all sides.

The two major cities around Garhi are Balaghat and Mandla.

Thus, markets of Balaghat and Mandla were the major district Mandis identified for the project.

Also, the local schools in each village procured potato from the farmers itself.



Fig 7. showing market areas around Garhi

Thus, the markets upto Balaghat and Mandla were identified as: Local School/Anganwadis, Garhi Market, Baihar, Balaghat, Sihora, Bichiya and Mandla.

The factors behind selection of these markets were:

1. Proximity: One of the major factors was nearness, which would save transport costs.
2. Dependence on other districts: These two districts are dependent on other districts for Potato and Ginger. Potato comes from Chindwra in MP and Lucknow, Kanpur and Agra in UP. Ginger in sold in these markets originates from Chindwara and from South India namely Bangalore, Cochin etc.

Beyond these markets, the advantage of transport cost will get eroded and there will be stiffer competition.

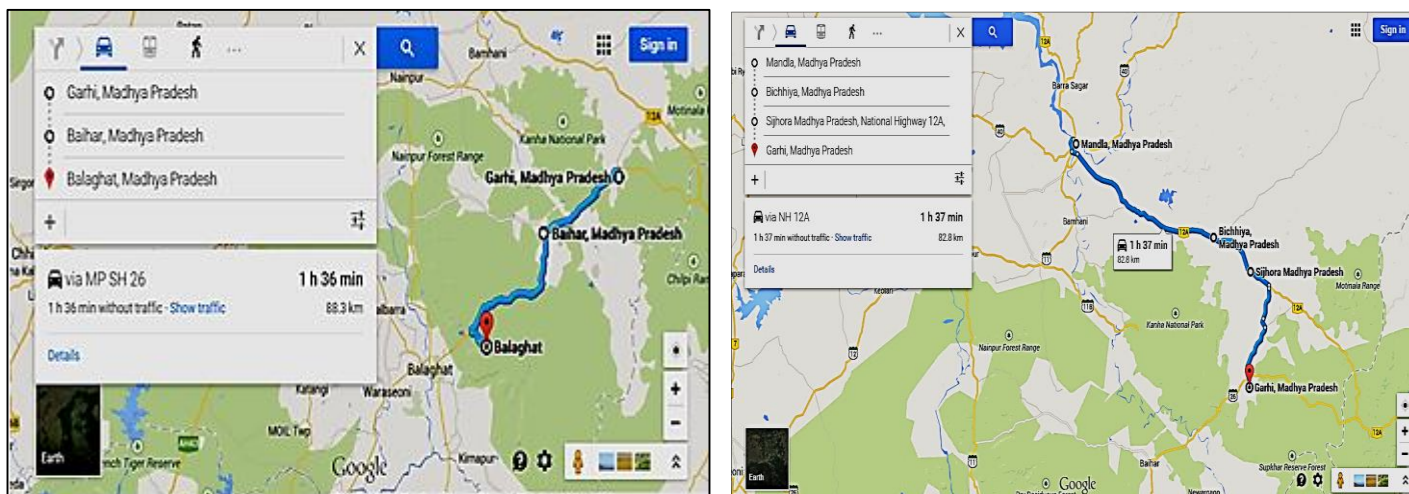


Fig 8. Distance of local markets from Garhi on Maps

Demand Assessment for each market:

Table 3. Demand assessment of markets around Garhi

MARKET	Village Schools	Garhi	Baihar	Balaghat	Sijhora	Bichhiya	Mandla
Distance Kms	-	5-10	35	88	23	45	82
Frequency per week	Once	Every Tuesday	Every Sunday	Sunday, Tuesday, Friday	Monday	Friday	Daily
Potato (qtl/week)	0.1	50	220	750	50	150	1500
Ginger (qtl/week)	-	0.5-1	2	5	1	2	9-10
Turmeric (qtl/week)	-	-	0.3-0.5	-	-	-	Not specified

C. Value Chain study for Vegetable Market

METHODOLOGY

1. Analysis of existing Supply Chain

The current value chain was studied in two zones:

- a. Supply Chains in other states of India
 - b. Supply Chain in the Existing Market
- a. Supply Chain in other states of India
The major Potato growing states in India were picked. After secondary research about markets in major potato growing states like UP and Bihar, their supply chain was studied.
 - b. Supply Chain in Existing Markets
For understanding the local vendors, wholesalers, commission agents and retail vendors were contacted in the local markets identified in the section above.

2. Analysis of this value chain

A comparison is drawn between the agriculture sector of other markets and agriculture in Garhi and its local markets to understand the need and significance of each driver of value chain

TOOLS USED

Analysis of Supply Chain: Secondary Research

FINDINGS AND RESULTS

Supply Chains for Potato & Ginger in other states:

Potato & Ginger reaches from the farms to the end consumer through the following chain:

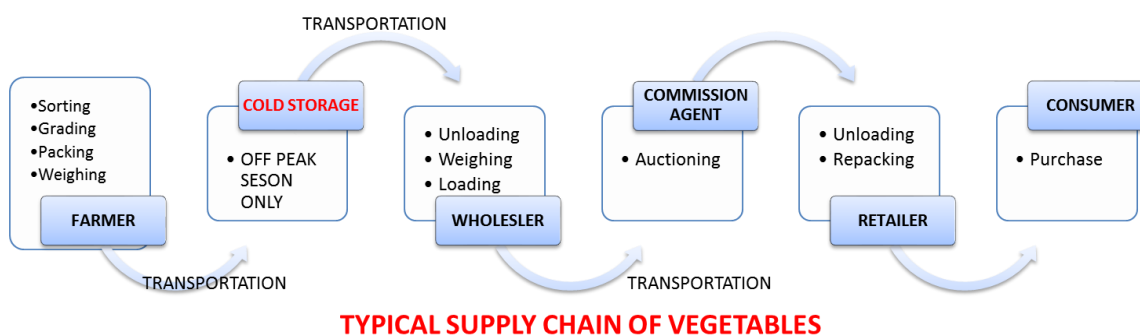


fig 9. Typical Supply Chain for Potato & Ginger

The Farmer has to sort the potato into various grades according to their sizes. He then packs them in sacks which are procured from a sack vendor. For off-peak season, farmers store a portion of their produce in cold storage.

The Commission Agent contacts the farmer and orders for the bulk quantity to be supplied. The farmer then weighs and loads the supply with a transporter to deliver to the commission agent. The commission agent then auctions the crop in *Mandi*.

The Wholesalers procure them from there, transport them using third party logistics or their own and supply to retailers in various parts of the city.

The Retailers unpack the vegetable and put them on display. Finally he packs them into small quantities as per customer's requirement.

The above chain is a depiction of how the markets function normally. The prices vary according to season and economy. However, the margins of each player in the chain remain constant.

The figure shows a break up of margin in the supply chain. As we can see that, the wholesaler takes away maximum margin. Eliminating a wholesaler will aggregate the value towards the farmer or consumer as the commission agent and transporter have fixed margins.

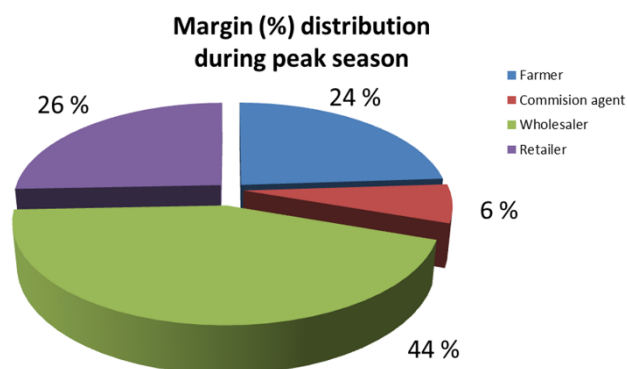


fig 10. Margin Break-up for Potato

Applicability of this standard value chain to the current project

The above chain is functional in areas of UP and Chindwara. Agriculture in those areas is practiced on a large scale and is different from the situation in our project area in the following ways:

1. Distant markets: The farms in Garhi are smaller (average 3-4 acres) and thus the output is low. In large farms of UP and Chindwara. The large scale farmers need more markets and thus have

to seek distant markets (even 500kms away). Whereas, the produce of small farmers like those in Garhi area can get sold in nearby markets itself.

2. Larger and more dispersed customer base: Having markets dispersed over large distances, the large scale farmers cannot manage the supply chain activities for each market. This not only requires time and effort but needs other skills like negotiations, finance etc which the farmers may not be adept at.

The above reasons force the farmers to fall into the hands of wholesalers who aggregate arrange for the sale of their products in turn capture a large chunk of value.

Thus, agriculture in Garhi being on a small scale, the need for wholesaler can be eliminated as the farmers can manage the supply chain activities upto the transport.

D. Value Chain Design for each crop in Identified markets

METHODOLOGY

1. Analyzing the Industry
2. Situation analysis for farmers in Garhi: SWOT analysis
3. Establishing Linkages with Supply Chain Members
4. Final Value Chain for each market.

TOOLS USED

Porter’s Five Forces, SWOT, One to one interactions

FINDINGS AND RESULTS

Industry Scenario:

The market scenario can be analysed using the Porter’s Five Forces Framework. The forces and their strength are tabulated below:

Table 4. Porter’s Five Forces Analysis of Vegetable Industry

Buyers	Suppliers	Competitors	New Entrants	Substitutes	Complementers
End consumer has no control over market. He is forced to buy whatever is available and pay the prevailing price	Suppliers of seeds and fertilizers are many and they look for more customers. However, prices depend on market conditions.	Large players who control the market supply and thus prices to large extent. Also a price war with them is futile	Easy to enter. However, if they are small players, then they succumb to price wars and lack of economies of scale	Fewer substitutes exist. Demand for potato and ginger shall exist and grow over the years to come.	Include Transporters, Cold Storage owners and commission agents. These play the upper hand in the supply chain. However, their margins are constant.

WEAK & STABLE FORCE	WEAK BUT UNPREDICATABLE FORCE	STRONG FORCE	WEAK & STABLE FORCE	WEAK & STABLE FORCE	STRONG BUT PREDICTABLE FORCE
--------------------------------	--------------------------------------	---------------------	--------------------------------	--------------------------------	-------------------------------------

Thus, we can see that sustenance in the vegetable market depends on Competitive moves and relations with Complementers.

SWOT Analysis of farmers of Garhi

For increasing the farm output and supply to local markets, the farmers must be aware of positive and negative side of their farming business. To paint a holistic picture, a SWOT analysis was done to understand the reasons - both internal and external, to be happy and cautious.

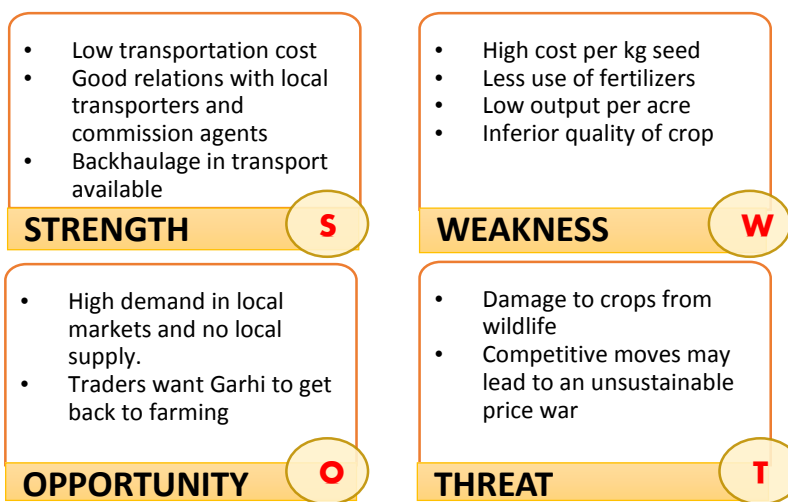


Fig. SWOT analysis for farmers of Garhi

We can see that both despite the core farming being a weakness zone for the farmers, the huge demand and lower transportation cost can act as drivers to make it profitable activity.

Identifying Supply Chain Linkages in each market

for Garhi and Baihar:

Garhi market has two kinds of vendors:

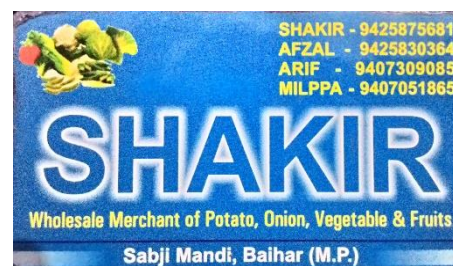
- I. Local farmers who bring their produce and set up their own shops
- II. Large Traders from other towns, who procure from wholesalers, transport to Garhi, supply to local retail vendors and also set-up their own shops

Interaction with Traders & Transporters and getting quotes from them:

A. Shakir :- Wholesale merchant of Potato

Shakir is also called the “Potato King” of the area. He functions in both Gaid and Baihar market. More than 90% of the market sells potatoes supplied by Shakir. On interaction with Shakir, the demand and his margins could be determined.

- Shakir sells around 22 tons of Potato per week in Baihar and 5 tons in Garhi.



- Shakir also arranges and bears the cost for his own transportation and loading and unloading labor.
- His charges include the costs borne by him and a commission of 6%.
- He is willing to pick vegetables from Garhi and sell in his markets
- Payment terms: Cash upfront at prevalent market rates after deducting his margins.
- Normal market rates hover around 8 Rs per kg.
- In Baihar market, Shakir also supplies Ginger and Onion.

B. Ramesh Patel: Wholesale merchant of Ginger

Contact No: 9424766231

Ramesh is a trader in Ginger, Onion and Chilli. He sells in all small markets of Balaghat and Mandla, each day in a different market. In Garhi, the supply of Ginger is monopolized by him. After discussions and negotiations with Ramesh Patel, he has agreed to do business with the project beneficiaries.

The terms of business with Ramesh is:

- Quantity of Ginger that can be sold by him is 1 quintal in Garhi and 2 quintals in other miscellaneous markets
- Transportation is to be borne by us
- Normal purchase price is around 40-45 R per kg. Market selling price is 60-80 rs per kg.
- Commission to be paid is 6% on prevalent market rates
- Payment in Cash

C. Agrawal Transport

Contact No: 9425899066

Vehicle type: Mahindra Bolero Pick Up

Capacity: 3.5 tonnes

Both side Haulage: YES

Charges:

- Around Garhi: within 10 km: Rs. 400
- Garhi to Baihar: Rs. 1000
- Garhi to Balaghat: Rs. 2000
- Garhi to Bichhiya: Rs. 1000

This company runs from Garhi and backhauls tiles and other hardware from Balaghat on its return journey. Thus it is most profitable to transport upto 3.5 tonnes from this agency.

for Balaghat:

Balaghat market has Retail vendors who buy from commission agents. These commission agents procure from wholesalers of Chindwara and UP. They also bring Ginger from Chindwara, Bangalore and Guwahati.

Interaction with Commission Agents & Transporters and getting quotes from them:

1. Sadan Sav : Commission Agent

- Commission : 8%
- Payment Terms : Cash
- Transport and Packing: Farmer
- Loading and unloading labour: Farmer
- Payment : Cash at prevalent Rates



- 2. Pitambar Sav: Commission Agent – 7%**
- 3. Balram Palewar: Commission Agent – 6%**
- 4. Balram Choure: Commission Agent – 7%**
- 5. Rakesh Sav: Commission Agent – 7%**
- 6. Hariram Anandram: Commission Agent – 6%**



Out of these, Hariram Anandram and Balram Palewar have agreed to charge lowest commission of 6%. Thus these will be our preferred agents.

7. Preferred transporter shall be Agarwal Transport only since the agency can carry other material as backhaulage, thereby reducing our transportation costs by half.

8. Packing Sacks: M/s Santosh Bardana Bhandar

When crop is sold to markets, the sacks are not returned. So each time the farmer has to procure sacks. For this there are sack traders who procure sacks from the wholesalers and retailers and sell them back to farmers.

Out of all the sack providers, M/s Santosh Bardana Bhandar can provide sacks at Rs. 800

for 100 sacks, the lowest in the market. These sacks can be brought back along with transporter.



for Sijhora and Bichhiya:

In these two towns, there are no wholesale dealers nor any commission agents. The retail vendors here purchase from large scale traders of Mandla.

Also, these vendors purchase on credit period as long as a month. This is not feasible for our farmers in Garhi.

Thus, direct selling in Bichchiya and Sijhora is not possible. These markets can be accessed only via traders of Mandla.

for Mandla:

Mandla Market has 2 main wholesale dealers cum commission agents. Also Mandla being a big market, 20 ton capacity trucks can be used to supply vegetables here.

The agents in Mandla Market are:

1. Dukhiram Anantram & Sons (Ravindra Sahu: 9425821045)

This is the largest dealer of Mandla and sells around 4-5 20 ton truckload full of Red Potato.

The terms of business are :

- Delivery to be done by farmer: Transport cost and labor cost borne by farmer
- Grading is a MUST
- Most Popular Grade: Kufri Locker
- Prices to be decided on grade and market prices
- Grading shall be done by seller (farmer)
- Payment: 1 week later. After sale of vegetables
- Commission: 6%



2. M/s Jamna Prasad Prahlad Kumar & Co.

- Delivery to be done by farmer: Transport cost and labor cost borne by farmer
- Grading is a MUST
- Most Popular Grade: Kufri Locker
- Prices to be decided on grade and market prices
- Grading shall be done by seller (farmer)
- Payment: 1 week later. After sale of vegetables
- Commission: 7%



3. M/s Gopal Traders & M/s Silwani Traders– Spice Traders

These traders are wholesale dealers of packaged spices. The vendors deal with raw Turmeric from farms and sends them for processing. On contacting them, the proprietors refused to discuss pricing and order quantity without seeing the samples.



4. Transporters:

- **Capt Sarkar Transport Co: 9372729391**
 - Fleet of 20 ton trucks
 - Cost – Rs.12000 per trip (one side no load)
 - Labour to be hired by farmer for loading and unloading
- **Ranjit Singh Ghrewal: 9425328625**
 - Fleet of 20 ton trucks
 - Cost – 15000 per trip (one side no load)
 - Labour to be hired by farmer for loading and unloading
- For less loads, a Bolero Pickup can be hired which will charge Rs.3000 for round trip.

The only disadvantage of selling in Mandla is that the transports have to come to Garhi empty. This almost doubles the transport cost.

To sum it up, the elements of supply chain can be drafted and are shown in the tables below:

SUPPLY CHAIN LINKS FOR POTATO & GINGER

In Garhi:

Vegetable	Transportation done by	Commission	Labor provided by	Payment terms
Potato	Vendor (Shakir)	6%	Vendor (Shakir)	Cash
Ginger	Agarwal Transport	6%	Self	Cash

In Baihar:

Vegetable	Transportation done by	Commission	Labor provided by	Payment terms
Potato	Shakir	6%	Shakir	Cash
Ginger	Agarwal Transport	6%	Self – Ramesh Vendor - Shakir	Cash

In Balaghat:

Vegetable	Transportation done by	Commission	Labor provided by	Payment terms
Potato	Agarwal Transport	6%	SELF	Cash
Ginger	Agarwal Transport	6%	SELF	Cash

In Mandla:

Vegetable	Transportation done by	Commission	Labor provided by	Grading	Pricing	Payment terms
Potato	Designated transporter	6%	SELF	Mandatory	As per grade	One week late
Ginger	Designated transporter	6%	SELF	Mandatory	As per grade	One week late
Turmeric	Sample invited	Gopal traders	SELF	Mandatory	As per Grade	-

SUPPLY CHAIN FOR TURMERIC:

Vegetable	Transportation done by	Commission	Labor provided by	Grading	Pricing	Payment terms
Turmeric	Self/Sample invited first	Gopal traders	SELF	Mandatory	As per Grade	-

NOTE: Supply to Sijhora and Bichhiya will be done by traders of Mandla. We shall therefore supply directly to Mandla.

Thus, we have established a supply chain and its business terms for Potato, Ginger and Turmeric for each market.

E. Cost Analysis and Profitability of the Value Chain

The cost of packaging, labor and transportation to each local market vis-à-vis the quantity transported will yield the per kg cost of transportation. Subtracting this cost from the selling price fetched in each market will yield the gross profit margin for each market. The calculation of gross profit margin will aid in two ways:

- i. It will help in maximizing overall profit for farmers
- ii. It will also set a target productivity level for farmers
- iii. The overall result would be calculation of target production cost in order to have a profitable supply chain

METHODOLOGY

The detailed analysis of each kind of cost incurred is carried out. The various costs involved are:

- a) **Production cost** – This will involve the cost of production per kg of each crop (Potato, Ginger and turmeric). It is calculated by taking into account the Material (Seeds, fertilizer and pesticides) and labour cost.
- b) **Transportation cost** – It includes the pick-up cost from the farm to the collection centre and then the distribution costs from the collection centre to the markets. The cost for different markets is different and is calculated according to the demand and quantity supplied in that market. To keep it fair to all the farmer we are aggregating the transportation cost and subtracting it from the revenue by taking a weighted average.
- c) **Haulage cost** – It is the cost of loading or unloading one sack on the transport vehicle. The prevalent rate is INR 1.5/- per sack for loading/unloading which make the total of INR 3/- per sack.
- d) **Purchasing of Sacks** – Before the final material is transported anywhere it has to be packed. The current cost of each sack is INR 8/- and it caters to 50 to 60 kg of good. We have taken a standard of 50 kg in our calculation.
- e) **Trader's Commission** – This is the commission paid to the agents who facilitate the auction of the produced good in the market. Generally the agents are of two types – Commission agents and wholesale purchasers. The commission agents claim a margin of 6% to 10% on the total sale while the wholesalers purchases the complete produce without any commission. The catch with the wholesalers is that since they purchase the complete produce, they offer a lower price.

TOOLS USED

Target Costing Model,

RESULTS AND DISCUSSION

A detail cost analysis of all the markets involve namely Commission agents, transporters, haulage labour and packaging was done for each market and different types of vehicles.

NOTE:

- i. Transportation cost varies according to distance and vehicle. Different kinds of vehicle are:

Table 5. Different transport vehicles

Vehicle name	Capacity
Tata Ace	1.5 tons
Mahindra Bolero Pickup	3.5 tons
Tata 407	5.0 tons
Tata 708	20 tons

- ii. No of vehicles can also be translated into No of transportation trips per week.
 iii. Except for the market of Mandla, all transport trips have material for backhaulage.
 iv. Labour costs are charged as Rs.1.5 per sack for unloading and same for loading.

The calculations for selling and distribution costs are as follows:

Table 6. Selling and Distribution Cost and contribution margins for different vegetable markets for Potato

Market	Units	Garhi	Baihar	Balaghat	Mandla
REVENUE GENERATED					
Weekly demand	qtl	50	200	750	1200
% of demand captured	%	100%	50%	15%	15%
Quantity sold	qtl	50	100	112.5	180
	kg	5000	10000	11250	18000
price per kg	Rs/kg	8	6	7	8
Total Revenue	Rs	₹ 40,000.00	₹ 60,000.00	₹ 78,750.00	₹ 1,44,000.00
TRANSPORTATION COST					
Transport Rate	Rs	₹ 500.00	₹ 1,000.00	₹ 2,000.00	₹ 12,000.00
capacity per vehicle	Kg	3500	3500	3500	20000
no of Transport trips		2	3	4	1
total transport cost per week	Rs	₹ 1,000.00	₹ 3,000.00	₹ 8,000.00	₹ 12,000.00
Labour per 50kg	Rs/kg	3	3	3	3
Labour cost (loading + unloading)	Rs	₹ 300.00	₹ 600.00	₹ 675.00	₹ 1,080.00
total transport cost per week	Rs	₹ 1,300.00	₹ 3,600.00	₹ 8,675.00	₹ 13,080.00
total transport cost per kg per week	Rs/kg	₹ 0.26	₹ 0.36	₹ 0.77	₹ 0.73
PACKAGING COST					
Sack cost per bundle of 100	Rs	800	800	800	800
sack capacity	kg	50	50	50	50
sack cost per kg	Rs/kg	0.16	0.16	0.16	0.16
COMMISSION					
Commission %	%	6%	6%	6%	7%
Commission per kg	Rs/kg	0.48	0.36	0.42	0.56
TOTAL S&D COSTS per kg	Rs/kg	₹ 0.90	₹ 0.88	₹ 1.35	₹ 1.45
Margin after S&D expenses per Kg	Rs/kg	₹ 7.10	₹ 5.12	₹ 5.65	₹ 6.55
Total weekly Contribution after S&D expenses	Rs	₹ 35,500.00	₹ 51,200.00	₹ 63,550.00	₹ 1,17,960.00

These calculations reflect that selling in Balaghat and Mandla cost more S&D expenses than Garhi and Baihar. However, the large volumes of business guarantee high contribution from these areas

Profitability of the Supply Chain

For the entire activity of growing and selling potato and ginger to be profitable, it is essential that apart from these costs, the production costs are within acceptable levels.

To determine the acceptable levels of production costs, we find the average contribution per kg after deducting S&D expenses.

Total Contribution = Rs. (35500+51200+63550+117960) = Rs. 268210

Total Sales Volume = 5000+10000+11250+18000 = 44250 kg

Thus, dividing total contribution by total sales volume, we get

Average contribution per kg after deducting S&D expenses to be 6.06 Rs/kg

Thus, for the supply chain to be profitable,

Target Production Cost for Potato < Rs. 6.06 Rs/kg

A similar analysis for Ginger (refer annexure -3) reveals that,

Target Production cost for Ginger < Rs. 45 /kg

Thus, we have set the target cost model for farmers to produce accordingly and earn profits.

F. Operational Plan

This is a detailed step-wise plan developed to facilitate the execution of the supply chain thus designed. The stage of the plan are:

1. Farms to Community Collection Centre
2. At Community Collection Centre
3. Transport from Community Collection Centre to Market
4. Collection of Payments

The flow of goods and money has been depicted as below



Fig. Cycle for flow of material and money from Garhi to markets

FARMS to COMMUNITY COLLECTION CENTRE (CCC)

The vegetables targeted, potatoes, turmeric and ginger, which are harvested by the farmers are to be sent to the CCC. The arrangement of the transport would be in purview of the farmers. As per their harvest, they shall arrange the transport of the appropriate capacity. In case they are not able to arrange for the same, the CCC authorities will help them to do so.

OPERATIONS AT THE COMMUNITY COLLECTION CENTRE (CCC)

MOTTO: To act as a node for bringing together the crop yield of farmers in order to reduce the transportation and other costs by collective transportation and selling. It must also be ensured that the process is equitable to the entire village and no few people are given too much power.

OWNERSHIP: Community

LOCATION: Garhi

OPERATION:

1. Farmers buy sacks from CCC, fill them and stitch them
2. Farmers unload their sacks of potato, ginger and tomato (Farmers will pay the cost of transportation from their farm to CCC)
3. CCC makes an entry with farmer name and no of quintals of crop (log sheet will be provided) and the grade of potatoes supplied shall all be noted.
4. CCC contacts transporters to load the yield and sends it to the market
5. Transporter will load crop and take it to the market. Commission agent will pay it to the transporter/CCC authorized person
(*Transporter will return with sacks required for next round of packaging and his back haulage from other party - Payment by farmer in advance)
6. A CCC volunteer will return the cash to the CCC and CCC pays the transportation cost
7. All money collected shall be deposited in a bank account
8. At the end of month, total sales and costs shall be given to CDC office.
9. A volunteer at CDC office shall calculate the amount to be disbursed per quintal of each crop. CCC shall also calculate the amount to be paid to all the farmers as per the quantity and the grades of vegetables supplied.
10. CCC apportions the money to the farmers (Excel sheet provided)
11. CCC appropriates the cost of maintenance on a per quintal basis and subtract it from each farmers profits

ADMINISTRATION:

- CDC will operate like a society where each member shall voluntarily take the responsibility of one task of CCC
- To prevent burdening just a few members of the village, the volunteers will keep on rotating among the participant farmers

TASK DISTRIBUTION:

TASK	DONE BY
1. Ordering, stocking and record keeping of sacks procured and purchase and sale bills	CCC (1 volunteer)
2. Loading unloading of material (labor)	Transporter
3. Collection of cash, record keeping of payments & bills	CCC (1 volunteer)
4. Record keeping of material unloaded by farmers	CCC (1 volunteer)
5. Record keeping of material unloaded by farmers	CCC (1 volunteer)
6. Disbursement of profits to farmers	CCC (1 volunteer)

MANPOWER:

- As described above, 5 volunteers will be required to run the CCC.
- Volunteers shall be from among the participant farmers
- These can be nominated by the Panchayat or CDC office
- Volunteers shall not be full time employees
- They won't be salaried

ASSETS REQUIRED

Grading Machine
Weighing machine
Notebooks
Table with drawer
Cupboard

CCC AUDIT:

- At the end of season, an audit of the CCC activities can be done to check the transparency and fairness of the process
- The Audit can be done by Gram Panchayat official.
- Also, a CDC volunteer can lead the audit work.

CCC TO MARKET

After the consolidation of the vegetables, the total stock has to be divided market wise. The CCC shall contact the various wholesalers in Balaghat, Mandla, Baihar market places.

Table 6. Schedule for activities for supply to different markets

Market	Stock Collection upto	Market day	Loading by	Dispatch by (before dawn hours)
Baihar	Friday	Sunday	Saturday	Sunday
Garhi	Monday	Tuesday	Monday	Tuesday
Mandla	on daily basis	Everyday	on daily basis	Everyday
Balaghat	Sunday, Wednesday, Friday	Tuesday, Friday & Sunday	Monday, Thursday, Saturday	Tuesday, Friday & Sunday

COLLECTION OF THE PAYMENT

Market	Payment term	Course of action
Baihar	cash on delivery	The CCC volunteer accompanying the transporter shall collect the payment and the receipt from the wholesaler and submit the same to CCC office
Garhi	cash on delivery	
Balaghat	Cash on delivery	
Mandla	Credit period of 7 days	The CCC volunteer shall collect the receipt and the payment confirmation date from the respective wholesaler and submit the same at the office.

Table 7. Payment collection schedule

As the wholesaler of each market have different payment terms, the above mentioned course of action must be undertaken for a smooth and transparent process.

- After the payment is deposited at the CCC office. The CCC officials shall deposit the same at the bank account maintained for the payment purpose.
- After the whole harvesting period gets over and the stock exhausts, the amount payable to each farmer shall be apportioned as per the quantity and the grade of vegetable supplied.
- The payment shall be done after the deduction of any administrative and transport costs.

RECOMMENDATIONS

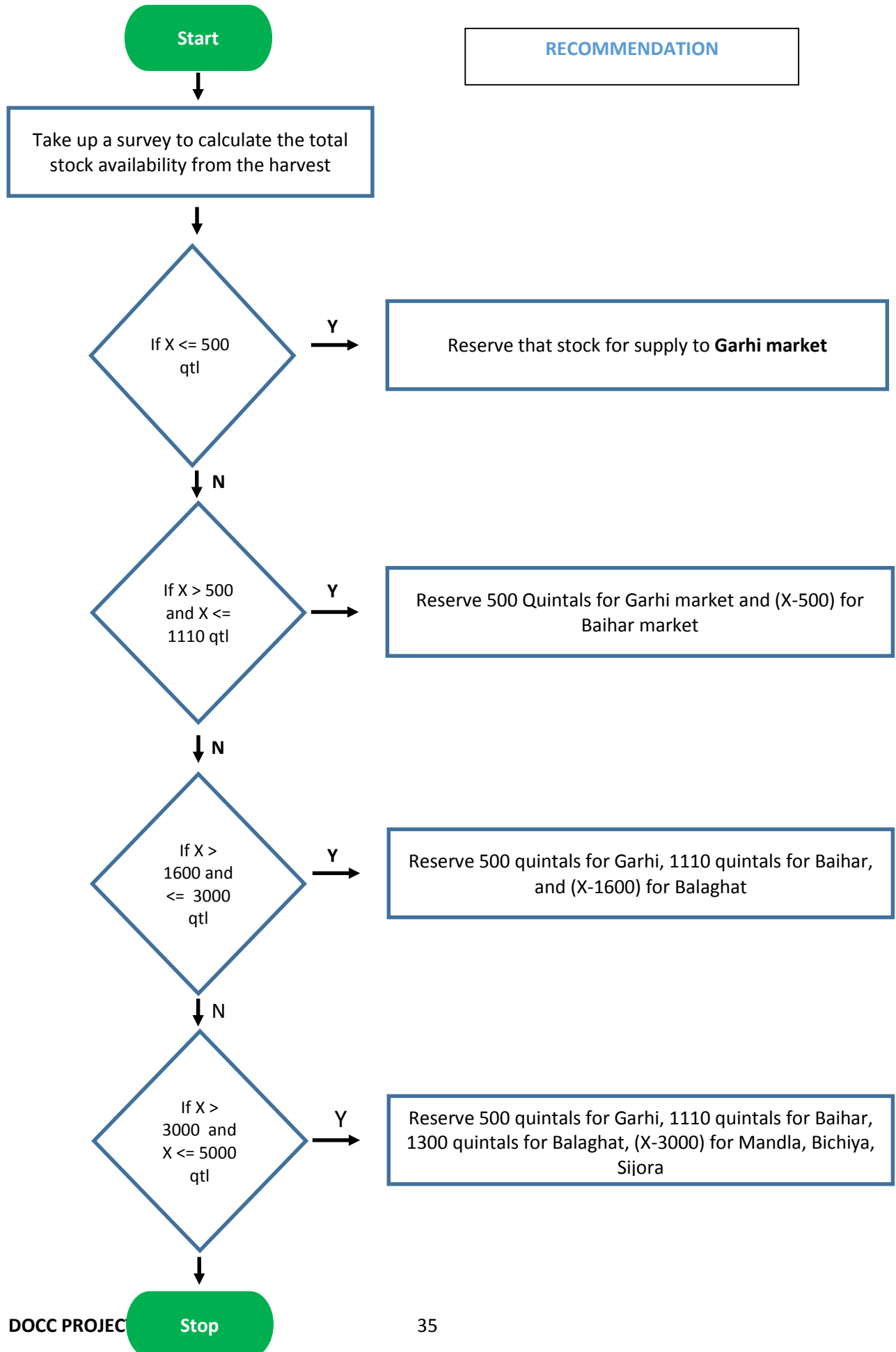
I. POTATO AND GINGER SUPPLY DECISION

After the detailed study carried out, the supply chain for Potato is shown below.

Selling in any market depends on the total farm output available. The different markets can be targeted only after reaching a certain level of farm output.

Flow chart shown below depicts the selling action to be taken at different levels of production.

Fig 11.. Flowchart Depicting Decision making for different levels of Output for Potato



II. Challenges

The local farmers are new to selling their produce to markets outside Garhi. Thus, there are several challenges – both operational and cultural, that need to be overcome to make it a reality.

Also, the growth of the value chain suffers from technological and geographical constraints that shall be difficult to overcome in the short term

Some of the major challenges that the project might face are:

ATTITUDINAL CHALLENGES

A. Resistance from farmers to increase farm output

The project beneficiaries and also everyone in these villages have lived a self-satisfied life. They grow for self consumption and have no intention to sell outside their community.

B. Lack of vision of a profitable enterprise

The farmers have not tasted the profits out of selling potato, ginger and turmeric. They consider these crops as petty crops and rely solely on wheat and paddy. As a result, they have little motivation to pursue this kind of farming on a larger scale

C. Low faith in their farming practices

The farmers are aware that the farming practices in other states involves high technology and infrastructure. This results in high output. They believe that since they lack these attribute in their farming, they stand no chance in front of the big players of other farming districts.

TECHNICAL CHALLENGES

D. Difficulties in achieving farm output

The farmer are new to this farming. Thus they lack proper knowledge of the crop, how to cultivate it, what techniques to be used, fertilizers to be used, what precautions to take etc. They cant even assess what should be their target output from a kg of seed.

E. Lack of finance and infrastructure

Garhi being a remote region of Madhya Pradesh, government schemes for irrigation and farmer have not reached the farmers yet. Also, there aren't any banks that could readily give loans to these farmers to assist them in building a better future

F. Wildlife Damage

Crop damage by wildlife is a major fear of farmers

PROJECT EXECUTION CHALLENGES

G. Farmers would like to sell Individually in local markets

A few farmers have been selling individually in Garhi *Mandi* every Tuesday. Every farmer would thus like to do the same rather than follow the designed supply chain

H. Famers wont accept getting rates of around 7-8 Rs/kg for potato

The farmers are aware that pink potatoes sell for Rs. 15-20 Rs per kg in markets. They would be unwilling to accept the price of 8 Rs per kg or even less.

I. Lack of coordination among farmers for selling collectively

Due to personal and village level differences, the farmers may not be willing to come together for the greater cause

J. Lack of initiative and coordination of operating a CCC (Community Collection Centre)

Running a CCC may be perceived as too cumbersome

The operation of a CCC would be perceived as too sophisticated and cumbersome for farming purpose. The farmers may be unwilling to operate one.

II. Strategic Intervention Zones

These challenges pose a risk towards the success of this project and call for timely intervention by CDC and its volunteers to mitigate these risks.

A. ATTITUDINAL CHALLENGES

a. Setting LIVING examples

The farmers need to see the practical feasibility of the project and the profits. Thus the CDC should create live examples of profitable farmers who can act as a source of motivation for all villages. To do this CDC must:

- i. Identify a set of farmers (upto 5) who have performed outstandingly till date in the project.
- ii. Closely monitor them and train them more in order to ensure they produce maximum output
- iii. Assist these farmers in selling by using the designed value chain on a smaller scale (say only for markets in Garhi)
- iv. Publicize the achievements of these farmers to the entire village

b. Taking help of PANCHAYATS

The farmers listen to Panchayats and their rulings. Discussing with Panchayats the benefit of this projects and convincing them to instruct their villages to start practicing potato, ginger and turmeric farming would be very effective

B. TECHINICAL CHALLENGES

a. Understanding the constraints

Both CDC and the farmers need to understand the constraints on the following technical matters:

- Productivity: It cant be as high as large scale farmers but upto 6 kg per kg of seed. Even this is a profitable venture
- Irrigation: Government schemes are being implemented. But drip irrigation is still not feasible on their plants
- Fertilizers: Inorganic ones may destroy their soil. Thus they should stick to use of inorganic fertilizers for targeted production level
- Machinery: Farm sizes being small use of machinery like tractors and harvesters is not technically feasible.

Under these constraints, they should accordingly plan their target costing

b. Giving proper training and supervision

Required training at different intervals must be given to the farmers to ensure their productivity remains high.

c. Fencing of the core area by forest authorities

Forest authorities are working on the fencing of forests. However, CDC and Panchayats must explain to them the extensive level of farming in near future and need for quick action on fencing

C. PROJECT EXECUTION CHALLENGES

- a. Training of volunteers: CDC volunteers must train themselves in this designed supply chain before taking it up with farmers.
- b. Training modules for farmers: Modules for training in the following areas need to be taken up:
 - Administration and record keeping of Community Collection Centre
It will involve record keeping for inventory, for crop received from farmers, and loading and unloading details
 - Procuring consumables like sack etc. and other assets
 - Contacting market agents and negotiating with them
It requires training in decision making for whom to contact and how to set price
 - Collection and Disbursement of Receipts of sale
It requires learning how to collect sale receipts from market agents and disburse the profits to farmers.
 - Managing payments and other finances including bank transactions
It involves managing an account of CCC expenditures and handling bank transactions of money deposit and withdrawal.

CONCLUSION

In this project, we have seen that the most profitable option for farmers to generate sustainable livelihood is farming and the farmers have sufficient ability to produce and sell in adjacent markets. The local markets around Garhi have been identified and supply chain links have been established. A detailed operational plan shall assist the ground-level execution of the plan. Also the NGO CDC needs to take special care to address the challenges and mitigate risks associated with the project. In light of current work, this project hereby establishes the necessary market linkages for generation of sustainable livelihood for farmers.

SCOPE OF FURTHER DEVELOPMENT OF PROJECT

To enhance the effectiveness for the execution of the designed supply chain, further work can be done in the following areas of the project:

- DEVELOPING MS-EXCEL PROGRAMS for calculation of PROFIT DISTRIBUTION among farmers
- Preparing TRAINING AND DEVELOPMENT modules on topics given above
- COLLECTIVE FARMING: Work can be done in identifying activities of the farming that can be done collectively and reduce costs

ANNEXURE- A

INTERVIEWS OF FARMERS TO ASSESS THEIR VIEWS ON INCREASING FARM OUTPUT

a. Interview with **Sheher Singh Merawi of Kadla Village.**

Q. What crops are they sowing?

A. I sow Paddy, Wheat, in the main farm and Potato, Arbi in the backyard of my house.

Q. Do you sow Ginger or Turmeric?

A. I do not have knowledge of Ginger but I have tried Turmeric once

Q. How much of each did you produce?

A. I produced around 8 quintals Potato last year but this year my crop got damaged due to rains. Turmeric produce was about 25-30 kgs and Arbi was 2 quintal.

Q. Did you sell in market? If yes, at what price?

A. I grew vegetables only for self-consumption.

In market, they would fetch me around 15-20 Rs/kg for potato, 60 Rs/kg for Ginger. I have no idea of Turmeric.

Q. What is the time of sowing and harvesting?

A. Potato is sown in October-November and by January, we can harvest them. Ginger also around the same time.

Q. Why is the land utilisation low?

A. I don't know how to sell that much produce. Also, wild animals continuously attack our farms and destroy our crop.

Q. What wild animals attack your farms? How frequently do they attack your crops? And how much crop do they destroy?

A. A lot of them. Wild Boars, Fox, Baisons. The most fearful is Porcupine. Animals come almost every night. And in some farms they have destroyed more than 90% crop.

Q. What action do you take against their attack?

A. We can't kill them. Just have to chase them away.

Q. Ok. So, what is the maximum you can produce on this land?

A. With complete land, I can produce around 25 quintals.

Q. What are the problems in doing that?

A. Also, I will have to hire manpower and buy fertilizers, which will cost me. Right now, I do it myself. Also, irrigation means are not available on that big scale. Wild animals to destroy our crops.

Q. If there is sale, how is the transport arranged?

A. Just as we do for paddy and wheat. We rent a 2-tonne Tata Ace and send it to society. The society takes care of further sale. We know nothing beyond that.



Fig 12. View of Sheher Singh's Farms

b. Interview with **Mother of Nainsahi Pattawi of Kadla Village.** (only important questions)

Q. Why don't you sow more potato?

A. If we get more seeds, we will. Right now, we were given only 20kgs.

Q. Where did you learn farming?

A. We were sent to Mandla by government to learn farming. In Mandla, there are farms, as big as 80 acres and they use drip irrigation. They use lot of fertilizers. Their production is very high

Q. Since you have learnt their farming, how much can you produce?

A. There in Mandla, farmers earn revenue of 22 lakh from 1 acre. We cannot do that much. We do not use fertilizers because it will render our soil sterile. Also, our crops get damaged by weed. We cannot afford weedicides.

Q. So, how much maximum output can your farm produce?

A. Maybe around 2-30 quintals.

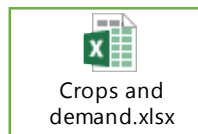
Q. So what are the treatments you do to soil?

A. Only manure and little urea.

ANNEXURE -B

SURVEY RESULTS FOR POTENTIAL FARM OUTPUT

DOUBLE CLICK INSIDE THE GREEN BOX TO VIEW EXCEL SHEET



ANNEXURE C

PROFITABILITY ANALYSIS FOR SUPPLY CHAIN FOR TARGET COSTING OF GINGER

Market	Units	Gadi	Baihar	Balaghat	Mandla
REVENUE GENERATED					
Weekly demand	qtl	50	200	750	1200
% captured	%	100%	50%	15%	15%
Quantity sold	qtl	50	100	112.5	180
	kg	5000	10000	11250	18000
price per kg	Rs/kg	8	6	7	8
Total Revenue	Rs	₹ 40,000.00	₹ 60,000.00	₹ 78,750.00	₹ 1,44,000.00
TRANSPORTATION COST					
Transport Rate	Rs	₹ 500.00	₹ 1,000.00	₹ 2,000.00	₹ 12,000.00
capacity per vehicle	kg	3500	3500	3500	20000
no of vehicles		2	3	4	1
total transport cost per week	Rs	₹ 1,000.00	₹ 3,000.00	₹ 8,000.00	₹ 12,000.00
Labour per 50kg	Rs/kg	3	3	3	3
Labour cost (loading+unloading)	Rs	₹ 300.00	₹ 600.00	₹ 675.00	₹ 1,080.00
total transport cost per week	Rs	₹ 1,300.00	₹ 3,600.00	₹ 8,675.00	₹ 13,080.00
total transport cost per kg per week	Rs/kg	₹ 0.26	₹ 0.36	₹ 0.77	₹ 0.73
PACKAGING COST					
Sack cost per bundle of 100	Rs	800	800	800	800
sack capacity	kg	50	50	50	50
sack cost per kg	Rs/kg	0.16	0.16	0.16	0.16
COMMISSION					
Commission %	%	6%	6%	6%	7%
Commission per kg	Rs/kg	0.48	0.36	0.42	0.56
TOTAL S&D COSTS per kg	Rs/kg	₹ 0.90	₹ 0.88	₹ 1.35	₹ 1.45
Operating Profit per Kg	Rs/kg	₹ 7.10	₹ 5.12	₹ 5.65	₹ 6.55
Total Profit in the market per week	Rs	₹ 35,500.00	₹ 51,200.00	₹ 63,550.00	₹ 1,17,960.00

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