CONTRACT FARMING OF SUGARCANE IN DHENKANAL DISTRICT

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BHUBANESWAR

2013

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Dedicated to

My

Father

Mother

Grand father

Grand mother

And

Two sisters

ORISSA UNIVERSITY OF AGRICULTURE & TECHNOLOGY
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Certificate- I

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The help and information availed during the investigation have been duly acknowledged by him.

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ABSTRACT

A study was conducted on the Contract farming of sugarcane in Dhenkanal district. Sugarcane is considered as one of the important cash crops grown in Orissa. Dhenkanal is one of the most important industrial districts of Orissa with numerious factories; the most important being Shakti sugar which is the largest sugar factory in the private sector to boost the sugar cultivation in the district and in the adjoining districts.A block viz. Dhenkanal sadar of the district was purposively chosen having maximum contract farmers for sugarcane. The farmers were stratified as contract and non contract farmers, which were further sub-stratified into three size groups i.e. Marginal Farmer (below 1 ha), Small Farmer (1-2 ha) and Large Farmer (more than 2 ha). A total number of 24 farmers each from contract and non contract farmers were randomly selected representing all the size groups from the district following probability proportion to size (PPS) method. Thus a total number of 48 farmers were selected from the district for final analysis.

The operational cost was found to be higher in case of contract farmers for all categories of farmers. Among the contract farmers, the cost A_1 was highest (Rs.64, 445) in case of large farmers with followed by small and marginal with (Rs.63, 185) and (Rs.61, 057.5) respectively. Over all the cost A_1, for contract farmers was Rs.50, 006.8. Among the

variables of cost A_1, Human Labour accounted for 54.50 per cent of total followed by seed, fertilizer, irrigation and manure respectively.

Among the non contract farmers, cost A_1 was found to be highest for large farmers (Rs.54, 502.5) followed by small and marginal amounting (Rs.53, 290) and (Rs.47, 335) respectively, over all the cost of production was Rs.51, 709.7. Among the non-contract farms, 59.32 percent of the total cost A_1 was incurred for human labor only followed by other input costs.

Overall the operational cost incurred by the contract farmers was found to be Rs.11186.6 higher than that of non contract farmers because of the use of improved technology, recommended doses of fertilizer.

The Cobb-Douglas production function for sugarcane indicated that the input variables like human labour, pest control and irrigation were found to be significant for contract farmers. The coefficient of multiple regressions R^2 varied from 0.995 to 0.997 indicating 95 to 97 variations in the output was explained by the inputs under consideration.

On contract farms, delay in payment of produce the most important constraint followed by lack of credit for crop production and scarcity of water for irrigation with corresponding Garrett score 60, 56.8 & 54.8 respectively.

On non-contract farms, scarcity of water for ratoon crop was the most important constraint followed by frequent power cutting & lack of credit for crop production with their corresponding Garrett score of 57.4, 54.6 & 53.0 respectively.

Contracting companies provide quality inputs such as seeds and plant protection chemicals to the farmers at their farm gate coupled with the technical advice on production aspects. Thus contract farming helped small farmers to improve their income levels. With respect to policy measures, strict norms should be enforced to follow the agreements mentioned in the contract in the interest of the farming community. The contract must be made legally tenable, to insulate farmers against exploitation by the contracting companies.

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CHAPTER-I

INTRODUCTION

INTRODUCTION

Sugarcane is an important commercial crop of the world and is cultivated in about seventy-five countries. The leading countries are India, Brazil, Cuba, Mexico and Thailand. The sugar industry plays an important role in the agricultural economy of India. The sugar industry supports the alcohol and paper industries with its byproducts, like molasses and bagasse. Molasses based cattle feed is assuming importance for the development of animal husbandry in India.

Sugarcane belongs to the family Gramineceae and genus Saccharum. The genes sachharum comprises mainly of five species, three of which are cultivated and two are wild species. Sugarcane crop has its origin in new Guinea, later it spread to many countries of the world. India is considered as homeland of sugarcane and 35 million farmers are engaged in sugarcane cultivation on 4.09 million hectares of land. Though sugarcane occupies only two per cent of the total cultivated area, it contributes to seven percent of the total value of agricultural output.

With respect to the area and production of Sugarcane over the years, it is observed that the area under sugarcane has increased from 3.66 million hectares in 2004-05 to 5.08 million hectares in 2011-12. The increase in area under sugarcane has been observed in the States of Uttar Pradesh, Maharashtra and Karnataka. The productivity of sugarcane has shown an upward trend during the period 2004-05 to 2010-11. The maximum productivity of 70,091 kg per hectare of sugarcane was achieved in 2010-11. Production of sugarcane after attaining a record level of 355.52

million tons during 2006-07, declined in the subsequent years but has started witnessing an increasing trend in recent years. The average annual growth rate of area declined marginally from 2.25% during the 1990s to 1.95% during the 2000s. The rate of growth in yield declined from 0.91% per annum during the 1990 to 2000 to 0.03% during 2000-01 to 2010-11.However, the average annual growth rate of production declined from 3.16% during 1990-91 to 1999-2000 to 2.2% during 2000-01 to 2010-11.

The present era of globalization and liberalization has witnessed significant changes in agriculture especially with respect to technology as well as to cropping patterns. The higher levels of agricultural output and ample food stocks as on date and the levels of storage during 2011-12 could augur well for bringing down headline inflation in the next fiscal. During 12th Five Year Plan the agricultural growth rate is estimated to be 3.28 percent against the target of 4 percent. Agriculture including allied activities accounted for 13.9 percent of Gross Domestic Products (GDP) in 2011-12.

The Indian agri-food system is undergoing rapid transformation and there is growing evidence that contract farming will have an important role in this transformation. An important concern in Indian agriculture is that while "front end" activities – including wholesaling, processing, logistics, and retailing – are rapidly expanding and consolidating, the "back end" activities of production agriculture have been continuously fragmenting (Gulati, 2008). The challenge lies in linking the two ends and ensuring viable business opportunities for both farmers and agri-businesses Companies. Contract Farming has been in existence for many years as a means of organizing the commercial agricultural production of both large – scale and small –scale farmers. In an age of market liberalization, globalization and expanding agri business, there is a danger

that small- scale farmers will find difficulty in fully participating in the market economy. In the era of globalization, the concepts of 'Contract Farming' are an effective way to co-ordinate and promote production and marketing in agriculture. "Contract Farming can be defined as an agreement between farmers and processing or marketing firms for the production and supply of agricultural products under forward agreements, frequently at predetermined prices." Contract Farming is essentially an agreement between unequal parties, companies, Government bodies or individual entrepreneurs on the one hand and economically weaker farmers on the other. The main feature of Contract Farming is that the buyer/contractor supplies all the material inputs and technical advice required for cultivation to the cultivator. This approach is widely used, not only for tree and cash crops but also, increasingly for fruits and vegetables, poultry, pigs, dairy products and even prawn and fish. Indeed, Contract Farming is characterized by its "enormous diversity" not only with regard to the products contracted but also in relation to many different ways in which it can carried out.

Contract farming is defined as a system for the production and supply of agricultural/horticultural produce under forward contracts between producers/suppliers and buyers. The essence of such an arrangement is the commitment of the producer/ seller to provide an agricultural commodity of a certain type, at a time and a price, and in the quantity required by a known and committed buyer.

Contract farming can also be defined as an agreement between farmers and processing and/or marketing firms for the production and supply of agricultural products under a forward agreement, generally at predetermined prices. The agreements also allow the purchaser to provide a degree of production support through inputs and technical guidance for the crop cultivation. From the farmer's side, there is a commitment to

produce the specified agricultural products within the quality and quantity standards prescribed by the purchaser, and the firm supports, in turn, the farmer's production, and also purchases the produce.

Contract farming has long-term benefits for both grower and purchaser, provided that their long-term association is mutually complementary. A sizable part of the farming community falls under the small and marginal farmers' category in India. Contract farming, therefore, becomes increasingly important as it allows their agricultural produce to be purchased by multinationals, small companies, government agencies, farmers' cooperatives and individual entrepreneurs. Odisha agriculture is dominated by small and marginal farms. About 82 per cent of the holdings are less than two hectares in size and are getting further subdivided. The cropping pattern in these farms is dictated by food needs and food crops occupy more than 85 per cent of the cropped area. This restricts the scope for income expansion through higher value non food crops.

Contract farming practices even if is a new concept was practiced informally since long in the state. The Odisha Seed Production Corporation established in the year 1978, is a State Government undertaking engaged in production of seeds through some registered growers in the state. This is one type of contract farming between Odisha Seed Production Corporation and registered growers. Likewise Shakti Sugar which is a private company running Sugar Factory in Dhenkanal District is making tie up arrangements of the farmers with commercial banks with buy back arrangements of sugarcane from the farmers. J.K. paper mills are also making contract arrangements with farmers for cultivation of Eucalyptus.

Well-managed contract farming is an effective way to coordinate and promote production and marketing in agriculture. Realizing the

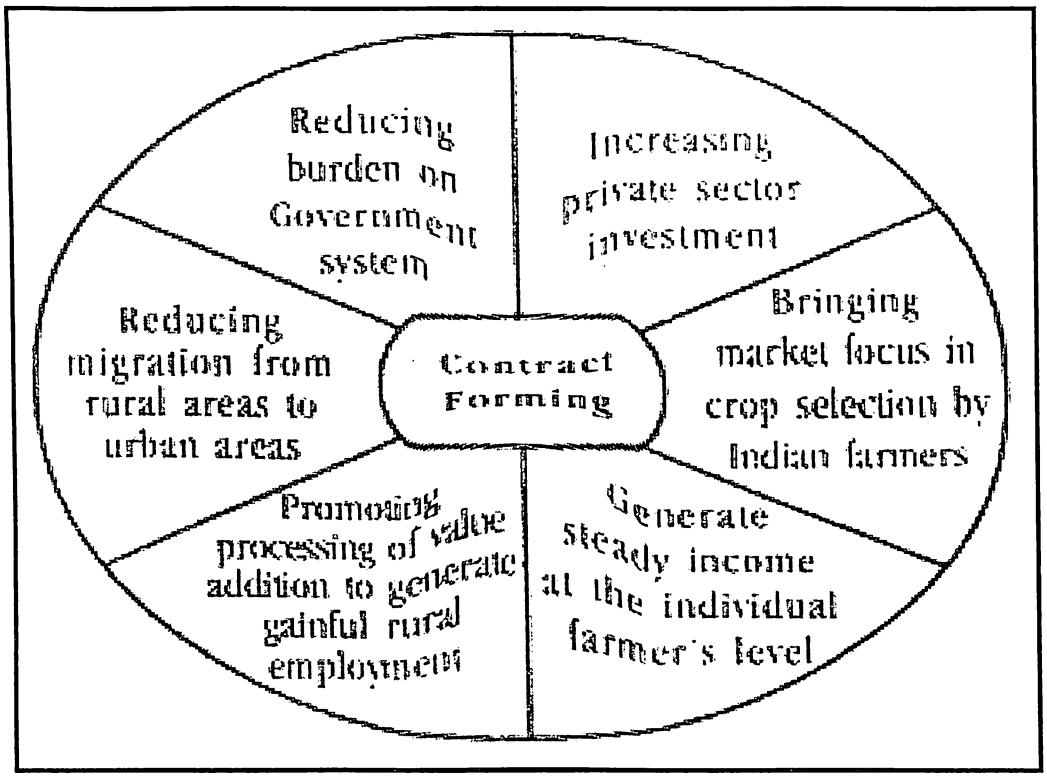
importance of the practice the present study will be conducted in one district of the state for the important crop i.e. sugarcane.

In this context, the present study is aimed at the following objectives:

1. *To examine the cost, return and input use efficiency of sugarcane in contract vis-a-vis non contract sugarcane farmers.*
2. *To find out the constraints of contract farming.*
3. *To suggest policy measures for better working of the contract arrangements in the prevailing system.*

Traditional feature of advance capitalist agriculture.

Contract farming represents an expanding and much suggested method of agro-industrial integration for developing economies. Agribusiness investment has grown through integrating the independent growers and farm families into new production complexes of the wide national and global economy by separating land ownership from the power to make land use decisions. Thus business firms control large number of growers to produce the desired crops. The grower provides land and labour whereas the agribusiness firms control quantity, quality, credit, inputs, production methods, price, market access and timing of delivery. The global change towards the relationship between agriculture and industry, urban and rural areas are inextricably linked. Dynamics of forward and backward linkages of contractual services for a wider range of field operations between growers and company form a crucial part of the process of globalization.



Triangle of contract production.

There are three major players in the system of contract farming i.e. producers along with its agro-climatic environments; consumers' demand a particular/ specialized product and the company with its technology and management. Assured market for the farm produce motivates a farmer to enter into contract with a company thus producers should be benefited, product of the company should be successful both in domestic and international markets and ultimately the demand of the consumers should be fully met and satisfied.

Types of Contract Farming

Market Specification	Resource Providing	Production management
Pre-harvest agreements Binding firm and grower on	Oblige the processor to supply of crop Inputs extension, credit in	Binding farmers to follow production methods in exchange for

Sales Governing price, quality	exchange for a marketing arrangement	a marketing arrangement

Linking different agribusiness groups: Apart from production of desired raw produce directly linked to processing, the agribusiness firms wish to become the main supplier of seed and other inputs. They are developing herbicides that are specific to a particular seed variety that it would not harm. The farmers would be forced to depend exclusively on a package of seed, chemicals and fertilizers suggested by a particular agribusiness multinational company. Over time, the concerned MNCs, by investing an enormous amount on Research and Development, will do everything to make the peasants perpetually dependent on by producing new package of practices every few years. Food manufacturers need the detailed information like price, quality, timing of delivery etc. To meet the retailers' requirements especially for won brands lines which are popular. Thus firms make contracts direct with producers, cutting out the middlemen and they control a critical step from production to consumption. Such new demand drives technologies that are turning bulk commodities into tailor-made products. As consumers become better informed and more demanding, companies are consolidating in pursuit of new efficiencies and economies of scale.

Contract farming exploits agro-climatic factors more rationally: Agronomic and climatic factors favour paddy-paddy crops over others. Production of paddy -paddy rotation has reached a plateau and has done immense harm to the ecology of eastern region of the country, adversely affecting the soil health, depleting the water table and having a negative impact on the economy as well. Farmer is always price responsive and is assured of better returns in market outlet of his crop in contract farming. That is why contract farming convinced and encouraged the farmer to

enter into contract production. Diversification in agriculture aimed at reducing the area under wheat and paddy over a period of time, state government on the behalf of the farmers entered into an agreement with the firm as to play a facilitating role to link farmers with processors and banks who would advance credit. Here the state government on behalf of company will procure or provide to farmers quality seeds, fertilizers, pesticides, farm equipment and extension services to raise yield.

Encourage private sector involvement: The farmers would grow the crop and sell it to concerned State Agro Food grains Corporation Ltd at a pre-determined contract rate and the latter will supply the same to that firm concerned. The Punjab Agro Food grains Corporation Ltd is not only providing seeds purchased form reputed MNCs to contract growers, but also will buyback the entire produce at pre-agreed price. This would enhance the high degree of private sector involvement in contract farming and concentration of foreign direct investment in agriculture and agro-industry. The role of concerned state Agro Food grains Corporation Ltd is that of an integrated farming solutions provider and could play the role of nodal agency to ensure timely and remunerative price to farmers and assured supply of quality produce to the units. Corporate are forging alliances with state government for contract farming. In Odisha farmers are encouraged to form seed villages to produce quality paddy seeds and sell the same to state seeds corporation as per contract farming arrangements. New incentives from private sector in precision farming and contract management of farm which must be linked to both domestic and external markets through agro-processing zones, stimulating floriculture and horticulture. Hence the state government can shift some area under paddy- paddy rotation to other crops like oilseeds, pulses etc. by adopting contract farming and right mix of price incentives.

The risks:

One of the most critical issues associated with contract farming is that the land which is currently used to produce staple crops such as rice and wheat will instead be used to produce crops required by the food-processing industry, and also have a significant overseas market. The switch to contract farming therefore leads to a rise in exports. In fact, many corporates enter contract farming to fulfil the export obligations of various benefits and subsidies they receive from governments. It is believed that contract farming will double agricultural exports from India to $20 billion by 2010. But, some farmers believe, it will diminish food security in the country, and will increase the risk of becoming dependent on food imports.

"If contract farming becomes the norm, then we lose food security. They (the corporate sectors) will tell us what crops to grow and they will give us the inputs as well. Except for labour and land, farmers don't have any role to play in contract farming," says Dr. Kishan Bir Chaudhary of Bharat Krishak Samaj, which claims to represent around 5,000 farmers in the country. He continues, "One also has to understand that with about 70 per cent of the population dependent on agriculture, it is not just a trade in our country. It is a way of life. The government should seriously weigh the pros and cons, and involve the farmers in policy making." Are these fears justified? Recently, Dr. Sukhpal Singh of the Indian Institute of Management, Ahmedabad conducted a study, Contract Farming for Agricultural Development: Experience of the Indian Punjab and Northern Thailand. He observes in his study, "Contract farming, in a political economy, is one mode of capitalist penetration of agriculture for capital accumulation and exploitation of the farming sector by agribusiness companies."

Little choice:

In any event, farmers may have little choice in the matter. With debt rampant, and soaring seed and fertilizer costs, contract farming appears a blessing, since all the inputs along with the know-how will be provided by the corporate entity, and there is also a guarantee of purchase of the produce after harvest. With agriculture increasingly seen as a risky proposition, the promise of economic security within the contract farming system may be very attractive. The health of soil a few years hence is a legitimate concern, but many farmers may ignore this to ensure their more immediate gains from contracting with companies. The main advantage of going in for contract farming is that the farmers don't have to deal with middlemen like the transport agent. For a corporate, the objective of contract farming is to integrate the supply chain to ensure timely availability of quality and quantity of materials. It also reduces the procurement cost for them by eliminating the middlemen. It is a win-win situation for corporate. Not only do they get produce as per their specifications, the cost is much less.

A report by the National Institute of Agricultural Extension Management, Hyderabad is quite candid about the risks for farmers. The report says, "Contract farming models can sustain in the long run only if the initiative for empowerment comes from the farmers rather than the user (corporate). Another moot point is that in the existing models, farmers are largely 'price takers', while the contracting firm 'makes' the price." The report also says that the contract farming is "very promising in its early years. Farmers benefit from improved technology and higher productivity, quality and production. The contract price does not matter much in the early years. Once the farmers are confident of being able to deploy new technology, problems start cropping up." The enforceability

of the contracts too is uncertain. The NIAEM report observed that "if the market price is more advantageous than the contract price, farmers renege on the contract."

However, the existing literature on contract farming identifies several major areas where contract farming can provide benefits. From the point of view of farmers, contract farming can provide access to markets, credit, technology and inputs that they would otherwise be excluded. Moreover, contract farming can lead to improvements in income reducing some of the risk farmers' face from production and price fluctuations. From the point of view of purchasers, contract farming provides greater control over volume and quality consistency; to a certain extent, it can also lower certain transaction and production costs that purchasers face.

Model of Contract Farming

Tobacco, Cotton, Sugarcane, Banana, Plantation Crops	
Centralized Model	Crop purchase for Processing-Quality Control
Tree Crops, Dairy	
Nucleus Estate Model	Technology Offer to Farmers
Common in China	
Multipartite Model	Government township committees and foreign companies join together with farmers
Fresh Vegetables and Tropical Fruits (Sri Lanka)	
Informal Model	Production contract on seasonal basis
Common in Thailand - Frozen Vegetables	
Intermediary Model	Food Processing - Co-operatives purchasing from individual collectors or farmers committees (informal arrangement with farmers)

Strengths:

The new agricultural policy envisages:

1. Acceleration of technology transfer.
2. Increased private capital flows in agriculture.
3. Assured markets for crops such as oilseeds, cotton and horticulture through contract farming system in which agricultural commodities are produced and supplied to buyers mostly processors/ exporters under certain pre-negotiated conditions.
4. Spot market purchases are fraught with uncertainties vis-à-vis quality, quantity and price. The search and information costs for the right quality and quantity are high under open market purchases whereas contract farming takes care of all these uncertainties.
5. Other advantages to the farmers are in terms of access to technology, supply of inputs and extension services thus modernizing the contract farmers.
6. The increasing income has created quality and health consciousness among consumers who demand food products of certain specifications. As the economy grows, the number of such discerning consumers is set to increase. The only demands of niche domestic and export market can be met by contract farming which allows firms to have control over production of crops at different stages.
7. Contractors got a guaranteed and steady source of supply, which allowed investment in large scale processing system.
8. Contract farming is an essential for entrepreneurial development.
9. The new paradigm of contract farming draws attention to the linkages across markets and adaptive behavior by rural decision

makers that often compensate for the apparent efficiencies losses caused by market failure.

10. Farmers have to exercise extra care to maintain the pre-agreed quality, results in reduction of both production and price risks.
11. The small farmers can effectively participate in contract farming only when there are backward linkages in the form of assured supply of inputs of all kinds.

Weaknesses: Despite these strengths, farming under contract has many weaknesses.

1. Contract farming is basically a way of allocating risk between the firm and its farmers. The distribution of risks depends largely on such factors as bargaining power, availability of alternatives and access to information, which are generally lacking with farmers.
2. The advantages ex-post i.e. after the investment has been made to one party leads to reneging on contract and exploiting the other party with the disadvantages. Especially in short term crops such as vegetables, farmers tend to divert the produce to the open market rather than supply to the processing firm when the prices are high. The cost calculations of the firms crumble as they are forced to arrange supply of raw materials from alternative sources with attendant uncertainties. Similarly, in long duration crops such as plantation crops, the firms often fail to honour the contract as they know that farmers have no alternative but to sell the products to them at lower prices. The latter also succumbs to the firm's dictates.

3. For agribusiness corporations, it is convenient means of spreading risks but for contracted growers it often brings strict production regimes and oppressive new forms of management.
4. The core questions pertaining to contract farming relatives to the ownership of decision-making where decision-making is partly removed from farmers, there arise issue of sustainability of field crops in long run.
5. Monoculture breeds insect-pest and waste resources.
6. The formidable lacuna exists in integrated contract farming approach in the state. There is lack of statutory validity of the contract. This apart, there is no uniform regulatory authority to ensure that the new arrangement is not misused to distort the markets or create other unintended problems.

Derivation of Hypothesis

In the light of the discussion made in chapter of review of literature and argument put in the above parts, the following working hypotheses are set up and investigation is carried out to test these hypotheses:

H_1- Contract farmers invest more and get higher return in comparison to non-contract farmers.

H_2- Resource use efficiency of the crop is higher for contract farmers' in comparison to non contract farmers.

H_3- Contract farming needs government regulation for smooth functioning of contractual arrangements.

Limitation

Though considerable precautions and thoughts have been exercised to make the study precise, objective and reliable, yet because of limited resources at the disposal, the study has been restricted to one block of one district only and could not be extended to larger areas. Individuals' biases and prejudices on the part of the respondents might have influenced the findings of the study because the field level investigation was based on individual's perception and expressed opinion of the respondents under study. However, from inter-checks of different elements of the data no systematic biases are, however, apparent.

The present study has been restricted to the sample farms taken from the one district i.e. Dhenkanal. The study is restricted for one crop for which contract farming is practiced in the state. Therefore, the results obtained are area specific. But due to its demonstration of the various issues and aspects of problem, the study might have much wider application and this could be extended to other similar areas.

CHAPTER-II

REVIEW OF LITERATURE

REVIEW OF LITERATURE

It is a common belief that reviews were a function of scientific findings and the methods used. Reviews are mostly informative and critical abstract showing what amount of work has been done on the problem or similar problem and what technical information is already available on the problem which a researcher wants to investigate.

For convenience, the review of literature is discussed under the following heads.

2.1 Benefits of contract farming

2.2 Impact on Income and Employment

2.3 The role of state

2.4 Conflicts for Resolution

2.1 Benefits of contract farming

Singh (2000) analyzed the role of contract fanning in agricultural diversification and development in terms of its practice and implications for the producers and the local economy in Punjab which was the most grown region of India agriculturally and there had been no studies relating to this aspect of Punjab's or India's agrarian economy. It explored the nature of contracts, studies the fanner and the firms' perceptions of the working of the contract system and problems, if any; and examines the effect of contract system on the local economy. The case studies were based on an interview survey of contract farmers, and discussions with the company officials [Hindustan Lever Limited (HLL), Pepsi] in three

different crops (tomato, potato and chilies) which were being procured under contracts and processed into value added food products for domestic and export markets. It basically involved four things - pre-agreed price, quality, quantity or acreage (minimum/maximum) and time. For individual farmers, it was not contract but the relationship it represents which was crucial as the divergence between the two may prove crucial in determining the development of contract farming as an institution. Further, it was the context of the contract which could be made a big difference as there were many factors in the environment which influence the working and outcome of contracts. The way farmers perceived contract fanning, i.e., defined their relationship with companies.

Kumar *et al.* (2004) studied Goat rearing had traditionally been an importance source of animal protein and the livelihood for rural poor people. Over the last couple of decades the factors such as continuous shrinkage in common grazing resources, increase in intensity of crop production and uneconomic use of labour for the grazing small goat flocks had posed threat to the sustainability of existing goat production system in many regions. Under these circumstances the small goat farmers had evolved a contractual system of goat rearing in south western semi-arid zone of Uttar Pradesh. This study examined the contractual arrangements adopted by the small farmers for sustaining of their goat production system. It used primary data collected from 50 small goat keepers and 15 goat contractors from selected five villages of Etmadpur block of Agra district. It was observed that the owner maintained on an average 4 breeding goats for five months and earned a net income of Rs 1053 per goat/year and the contractor maintained goats on grazing for 7 months from February to August and earned a net income of Rs. 743 per

goat per season. The contractual system had evolved for the mutual benefit to the owner as well as contractor. This system allowed the small goat keepers to use the common property resources and Open access to private fallow land for feeding their animals through contractor. This also provided an opportunity for the better targeting the transfer of technology in large flocks with contractor as compared with the small flocks scattered all over the villages. This system therefore needs to be encouraged especially in the irrigated areas with limited opportunity for grazing the goats.

Agarwal *et al.* (2005) observed that majority of non contract farmers felt lack of knowledge about improved technologies of cotton production. Few contract farmers faced rejection of produce due to deterioration in quality. A set of contract farmers, in spite of enjoying higher price were not satisfied with the stipulated contract price by the sponsor. To conclude, it could the functional analysis revealed that there existed a substantial scope to increase the cotton production through judicious use of critical inputs. To made this venture a success, contract farmers and sponsoring firms should strictly adhere to the contract procedures. Farmers should be educated about optimal use of inputs.

Devaraj *et al.* (2005) analysed contract farming of Gherkin in Karnataka. The state is endowed with fertile soil, which is suitable for producing Gherkin at almost all the regions of the state. The major Gherkin producing districts of the state were Bangalore Rural, Hassan, Kolar, Tumkur, Chitradurga, Dharwad, Bagalkot, Davangered Hubli. The cultivation of gherkin is highly labour intensive and it could be grown under 18° to 35° temperature. In an era of market liberalization, globalization and expanding Agri-business, there was a hazard to small and marginal farmers fully participating in the market economy. Small

and marginal farmers lacked in both reliable and cost-efficient inputs such as extension advise, mechanization services, seeds, fertilizer, credit, guaranteed and profitable market for their output. At the same time the agro-based food industries required timely and adequate supply of good quality inputs. This under lying paradox of the Karnataka's agricultural scenario had given birth to the concept of "contract farming", which promised to provide a proper linkage between the "farm and market". More than 80% of the farmers came under small and marginal category, having 0.3 to 2.5 hectares of land under cultivation. They face diseconomy of scale due to declining farm size and increasing subdivision and fragmentation of holding and disposal of output in small quantities at profitable prices was often a great constraint owing to poor marketing outlets. Hence, the introduction of contract farming facilitates integration of production and marketing of produced by numerous small gherkin growers in the state. Cultivation of gherkin in Karnataka under contract farming was mainly for export, which generates higher foreign earnings, besides offering employment to local people. The state was first in country's trade by contributing more than 90% of the gherkin production of the country. This paper also threw light on the availability of infrastructure for development of gherkin, the impact of the globalization and liberalization on gherkin growers and the formulation of appropriate policies and developmental measurers to strengthen the marginal and small gherkin growers towards the export from the state.

Prakash and Sharma (2005) suggested Contract farming is considered as an effective tool of generating supplies for processing industries and exporters with a substantial potential of adding value to agriculture in India. The success of contract farming depended on the mutual benefiting relationship between producer, consumers and agro

processing industry. It provided assured price to the producers, assured supply of specific quality to the processor and a quality product at a reasonable price to the consumers. Due to number of advantages like potential to substitute for the state, availability of managerial, technical and extension services, credit availability, learning of new skills by the farmers like record keeping, an efficient use of farm resources, improved method of applying chemicals and fertilizers, reduction of risk associated with crop production, corrective tool to market imperfections, powerful means for new crop/technology, increasing income of the farmers and employment generation, contract farming appears to be a better proposition but it had certain limitations like over exploitation of natural resources, destruction of sustainability aspect, dismantling of procurement structure of the country, danger for food security, increasing number of suicidal cases in the states having contract farming, increasing cases of mistrust, increasing unemployment particularly among men, farmers being labourers on their own land, involvement of higher risks, inefficient management and monopoly of single crop. Thus, contract farming can prove a boon for the farmers of the Country but with certain precautions. Contract farming was important among several possible interfaces between crop cultivation and its processing and consumption. It had emerged as a powerful means of introduction of new crops or technology, especially when both marketing and production uncertainties predominate. We should learn lessons from the experience of the Philippines, Zimbabwe, Argentina and Mexico. Forcing the farmers to shift from staple food to cash crop should riot lead to problem of food security in the country. At the same time, sustainability, biodiversity and environmental aspects should also be looked into while adopting contract farming.

Bhardwaj (2005) observed Contract farming was a sort of relationship developed between farmers and processing units to satisfy their common interests. Basically this was an agreement between two financially unequal partners. Farmer was the weaker one, looking for resources at reducing level of risk and finally to increase his farm income. Contract farming may be used as a tool to enhance income levels of rural agricultural poor as a part of poverty eradication programme in backward and tribal areas. The lac farmers generally find it was difficult to purchase brood lac with his limited financial resources. Contract farming will help in managing for brood lac in time. Time was a critical factor in lac cultivation and matters of limited hours. In most of the potential lac cultivating areas there is always shortage of brood lac. The introduction of Contract farming would help in developing brood lac farms in those areas to increase the supply of brood lac. With the result a large number of un-utilized lac hosts holdings could be exploited for cultivation of Iac. In the case of Iac cultivation informal model seems to be most appropriate because input requirement is minimal and duration of crop is restricted to few months. The informal contract between lac cultivators and processor invite little problems because whatever service rendered by processor to the cultivator would be paid back in crop season which happens to be twice in a year. Regarding pricing arrangements as lac was mainly export oriented crop and its price level depended on export demand' flexible price seems to be more plausible in this case. The thrust was the price in the domestic market should move along with the foreign market. The increased crop production would provide opportunity to raise income levels. The study of selected lac cultivators spread over Chhattisgarh, Madhya Pradesh and Maharashtra. In Chhattisgarh the average exploitation rate of major lac hosts including Palas and Kusum remained about 68 percent i.e. 32 per cent of available host could not be

utilized due to absence of inputs. The situation became worst in Madhya Pradesh and Maharashtra where the exploitation rate falls to 52 per cent and 51 per cent respectively. It showed that farmers were suffering from severe shortage of resource inputs for lac cultivation. A vast untapped potential of lac production exist in our country. Even if we could achieve 1950's production level of 50,000 metric tones of lac, it would be a matter of great satisfaction. Contract Farming may help to resolve this situation. Large number of unexploited hosts may be brought under cultivation and total crop output may be enhanced. The higher cash earnings of tribal poor would help them to improve their living conditions.

Kalamkar (2005) suggested to establish an agrarian economy that ensures food and nutrition security to a population of over a billion, raw material for its expanding industrial base, surpluses for exports, and a fair and equitable rewarding system for the farming community, commitment driven contract farming was no doubt a viable alternative farming model, which provided assured and reliable input service to farmers and desired farm produce to the contracting firms. Contract farming in India was set to grow as it has helped reduce market risk associated with crop cultivation and it had potential to be an effective instrument of credit deepening. The studies of contract farming showed that the farmers agreed that contracting help them better farming, have more reliable income, zero price uncertainty and less production risks, provided new skills of farming and generated employment especially for women.

Ponnusamy *et al.* (2005) observed that the farmers are highly satisfied with assured returns, risk reduction, timely availability of critical inputs including technical guidance, arrangement of credit and transport facility under various dimensions of contract farming. Delay in arranging inputs, credit, making contract, lifting produce at field, unloading the

produce at factory and payment, inadequate field visit, falling ground water level and partiality towards big farmers were felt by farmers as major constraints in contract farming. Arrangement and supply of inputs in time, regular field visit and interaction with stakeholders to sort out the problems were the some of the suggested measures to further improve the performance of contract farming.

Boulay (2007) conducted a study of contract farming for eucalyptus in Thailand. Contracting companies, which were using eucalyptus wood for pulp and paper production, do not provide credit to contract tree farmers. Based on an household survey of 450 eucalyptus tree farmers, He found that better-off farmers are more likely to adopt a contract because they had the financial capacity to comply with the terms of the contract The findings suggested that contract farming could be an effective private-sector-led mechanism to facilitate the transition to commercial agriculture. In addition to bringing foreign direct investment into the rural sector, contract farming could be an effective tool to improve the profitability and raise the incomes of small farmers, thereby reducing poverty in rural areas with limited market development. Contract farmers would have lower profits than non-contract farmers if they operated outside of the contract

2.2 Income and Employment

Dileep and Grover (2000) had made an attempt to study the cost of production and marketing of tomato under contract and non-contract farming system in Haryana. The study was based on the primary data collected from the contract farmers registered with both the processing firms, viz., The Hindustan Lever Ltd., (HLL), Hoshiarpur and The Nijjer Agro Foods Ltd. (NAL), Amritsar (both in Punjab State) operating in the

study area. A matching number of non-contract farmers were also selected. In total 100 farmers were interviewed for collection of data. The results of the study reveal that the contract farmers are selected by the processing firms based on their land holdings, economic condition, water source, field history, commitment level, etc. The contract farmers were supplied 'with high-yielding variety seedlings by their respective processing firms by charging a sum of Rs. l, 800 each per acre. Besides, they were given improved farm implements and technical guidance of the companies. The contract farmers sold their produce to their processing firms at procurement price of Rs.188 per quintal. It was observed that the cost of production was lower in HLL-contract farms as compared to NAL-contract farms and non-contract farmers. The benefit-cost ratio was the highest for HLL farmers (2.16), followed by NAL farmers (1.97) and no contract farmers (1.75). It was further observed that the HLL farmers got higher yields as compared to NAL farmers and non-contract farmers. The contract farmers incurred higher transportation charges than their counterparts. However, other marketing charges such as packing, grading, loading, unloading, etc., were the highest for non-contract farmers. The average net returns obtained by the contract farmers were the highest, followed by the non-contract farmers. Thus it was concluded that contract farming in tomato was beneficial to the farmers.

Erappa (2005) examined the Gherkin crop undertaken under contract farming in Karnataka and assessed the impact on income and employment generation and farmers' perceptions on continuation of the contract farming. Karnataka had already given a clue that Gherkin (small cucumber) revolution brought much needed income to the impoverished farmers in the state. There were about 25 companies currently involved in contract farming in Karnataka, and all these companies are promoting

Gherkin crop to cultivate under contract farming. The study purposively selected Tumkur district in Karnataka and covered 150 contract farmers. The average land holding of contract farmer was 4.78 acres, of which dry land and irrigated land account for 2.32 acres and 2.46 acres, respectively. It was observed that among social groups average size of holdings owned by backward castes in both dry land and irrigated land, had an edge over the land holdings of SC/STs in the study area. Educational level of the contract farmers have very high literacy rate (99 per cent). Out of 150 contract farmers, 90 per cent had grown gherkin crop in 0.50 acres, 4 per cent in 0.75 acres and 6 per cent in 1 acre. Gherkin crop tops in cost of cultivation, both gross cost and net returns as compared to other crops grown by contract farmers and the least being ragi crop in terms of cost and returns. The employment generation was to the tune of 450-500 man days per year and majority of the labourers employed are women. The availability and utilization of facilities given by the companies like inputs, transport and technical support were found to be satisfactory. The average annual income mobility of contract farmers, before contract farming and after contract farming, shows 10 per cent of the contract farmers whose annual income was less than Rs20,000 (below poverty line) had crossed above the poverty line in the study area. The sustainability of the gherkin crop warrants state intervention policies through legislations, private insurance companies' role, local institution supervision and farmers participation in the contract farming system.

Kalamkar (2005) for successful contracting farming, a legal protection to contract growers as a group is a must to protect them from ill effect of contracting. It should be made legally obligatory on the part of the contract farmers and the processing firms to strictly adhere to the contract by bringing suitable legislative measures by the government.

Farmers may be educated to make judicious use of inputs and to adopt integrated pest management (IPM) practices, which minimise the use of inputs and reduces the cost of production and also environmental problems. Processing firms, PACS, and other financing agencies should be persuaded to provide adequate short-term credit facilities to cover higher cost of variable inputs. The processing firms may procure the produce at the farm gate or make, transportation arrangements to make contract farming more lucrative and firm may spend part of the profit for development of infrastructure in the production region. Crop insurance scheme may be introduced to compensate the farms when there was very high occurrence of pest and diseases apart from adverse climatic conditions with a reasonable premium.

Ponnusamy and Gupta (2005) studied contract farming in sugarcane in Thanjavur district of Tamil Nadu. The data collected from randomly selected sugarcane contract farmers revealed that assured price, credit, market, inputs, technology and reduced risk were perceived as the major motivating factors to prefer contract farming in sugarcane farmers. They were highly satisfied with assured returns, risk reduction, timely availability of critical inputs including technical guidance, arrangement of credit and transport facility under various dimensions of contract fanning. Delay in arranging inputs, credit, making contract, lifting produce at field, unloading the produce at factory and payment, inadequate field visit, falling ground water level and partiality towards big farmers were felt by farmers as major constraints in contract farming. Arrangement and supply of inputs in time, regular field visit and interaction with stakeholders to sort out the problems are the some of the suggested measures to further improve the performance of contract farming.

Haque (2008) the effect of contract farming on the yields and income

of the farmers was found to be positive. But small farmers can effectively participate in contract farming and benefit only when there are backward linkages in the form of assured supply of inputs of all kinds crop.

2.3 The role of state

Dileep and Grover (2000) suggested that the Government should take necessary steps to encourage new agro-processing firms so that more number of farmers may be registered as contract farmers. Suitable legislative measures should be taken by the Government about contract farming system to check cut in weights, rejection of the produce, breaking the contract by the farmers by selling in the open market, etc. It was also suggested that the processing firms should provide transportation facilities, pesticides, the processing firms and the financial institutions should provide crop insurance. Also, the Government may provide minimum support price to a perishable commodity like tomato similar to that of some cereals.

Kumar and Singh (2005) analysed the Contract Farming system in cauliflower seed production in Himachal Pradesh. The study was based on the data collected from 45 farmers of Saproon Valley. National Seed Corporation (NSC) firstly introduced the contract farming in Saproon valley in 1966 and it remained in operation up to 1977. After withdrawal of NSC from the area the producers were dependent on the private firms for the marketing of seed. In the present system the net returns per hectare were relatively higher in cauliflower seed (Rs. 1, 12,994 per hectare) followed by tomato (Rs. 68,971 per hectare), peas (Rs. 28,068 per

hectare) and capsicum (Rs. 20,180 per hectare). The production of cauliflower seed reduced the seasonality of employment in agriculture in lean period and utilises the idle family labour. Cauliflower seed production required plant protection chemicals worth Rs. 22,700 per hectare while in case of tomato and capsicum it was Rs. 38,600 and Rs. 34,400 per hectare respectively. The private firms operative in the area were successfully attracting the farms for production of cauliflower seed as they were providing technical know-how, timely supply of mother seed and credit and assured market. The principal causes for failure of contract system of NSC were its inability to procure all the seed produced with producers and failure to compete with private traders. The major shortcomings of the present system were absence of written legal agreement, lack of prior price information, near monopoly of firms, deductions made to account the moisture content and foreign material in the seed the study suggested that to protect the interest of the producers there should be provision of written agreement between the firms and producers for the procurement price and quantity supplied. It was suggested that there should be some provision of registration, regulation and control over the private firms dealing in contract farming in the state. It was recommended that the government should establish suitable agency for development of seed production in the state. 'Cooperative society should be organised in the production and marketing of seed. The potential area where agro-climatic conditions were suitable for the production of seed in the state should be identified and suitable steps should be initiated to encourage the farmers for the quality seed production.

Kalamkar (2005) for successful contracting farming, a legal protection to contract growers as a group is a must to protect them from

ill effect of contracting. It should be made legally obligatory on the part of the contract farmers and the processing firms to strictly adhere to the contract by bringing suitable legislative measures by the government. Farmers may be educated to make judicious use of inputs and to adopt integrated pest management (IPM) practices, which minimise the use of inputs and reduces the cost of production and also environmental problems. Processing firms, PACS, and other financing agencies should be persuaded to provide adequate short-term credit facilities to cover higher cost of variable inputs. The processing firms may procure the produce at the farm gate or make, transportation arrangements to make contract farming more lucrative and firm may spend part of the profit for development of infrastructure in the production region. Crop insurance scheme may be introduced to compensate the farms when there was very high occurrence of pest and diseases apart from adverse climatic conditions with a reasonable premium.

Ashankar (2005) observed many attempts were made by the governments and development agencies to accelerate the "income generation activities" in the rural area. Unfortunately there was relatively little evidence that such attempts have yielded fruit. Rural farmers and small-scale entrepreneurs lack both reliable and cost-efficient inputs such as extension advice, mechanization services, seeds, fertilizers and credit and guaranteed and profitable markets for their output. Well organised contract farming does, however, provide such linkages, and would appear to offer an important way in which smaller producers can farm in a commercial manner. Similarly, it also provided investors with the opportunity to guarantee a reliable source of supply, from the perspectives of both quantity and quality. Contracts needed to specify some following aspects of the sponsor-farmer agreement like Contract

duration, Quality standards, Production quotas, Cultivation practices, Crop delivery arrangements, Pricing arrangements, Payment procedures and Insurance arrangements. To promote an agrarian economy and food security contract farming was no doubt a viable alternate. Several Indian and multinational companies have already begun such initiatives in India and have demonstrated rapid success.

Singh (2005) observed Contract farming was being promoted to achieve the diversification by promoting high value crops, lowering costs of production with better extension and raising returns by assured market and higher prices for the produce. He examined the role of contract farming in helping agricultural diversification and development in Punjab. He examined briefly its nature, growth and status. Including the performance of different models of contract farming based on empirical studies. The paper concluded by drawing lessons for agribusiness policy for contract farming to play an effective role in agricultural development in the state.

2.4 Conflicts for Resolution

Glover (1987) observed that in several cases, contracting schemes had multiple and often conflicting objectives of its various partners. The government may be interested in promoting development and equity, an agribusiness firm look for cheap and reliable supply of raw materials and profit maximization, and the farmers expect best deal in terms of price and other services. When these objectives were not rightly balanced in an arrangement it may lead to disruption and eventual collapse of the relationship. Even in bilateral arrangement between the farmers and the farm several problems crop up.

Chakraborty and Chakraborty (2005) had observed Contract Farming was operational in India for the last couple of years, and an increase in the number of corporate entering the field had been noticed in recent years. This had raised concerns in the academia as well as policymaker circle over the effectiveness of the model in enhancing farm income and employment, potential impact on small farmers, degree of technology transfer to the farmers etc. The social responsibility of the corporate in terms of adoption of environment friendly production process had also been a major debatable point. Last, but not the least, effective management of ex post opportunistic behavior of the private firms and the farmer poses the biggest challenge. Considering the available evidence from India, the study concludes that while the contract farming had broadly been a successful affair, upsetting instances at places are ground realty. Furthermore, contract farming was not a solution to the existing problems. However, a better outcome could be expected, if a number of systemic reform measures are undertaken at the earliest. On one hand, the infrastructure level ought to be massively enhanced and contract farming should be made legalised in all states on the other, so as to make it binding on both the concerned parties.

Kumaracharyulu *et al.* (2005) observed lack of transparency in the contracts, combined with the poor bargaining power of farmers, manipulation by managers in respect of quotas and quality as also the farmers breaching the contract by selling in the open market, or by diverting the inputs received under the contract to other crops or un-contracted areas in the absence of contract farming law was to be blamed for most of the problems.

Kumar and Singh (2005) the study suggested that to protect the interest of the producers there should be provision of written agreement

between the firms and producers for the procurement price and quantity supplied. It was suggested that there should be some provision of registration, regulation and control over the private firms dealing in contract farming in the state. It was recommended that the government should establish suitable agency for development of seed production in the state. Vasudev and Chowdry (2005) analysed different types of Contract farming. There were of two types of contract arrangements, Type I was also called corporate farming in which a company enters into an agreement with farmer for leasing-out farmers' land. Type II dealed with supply of inputs to farmers and purchase of output at a price fixed in advance. The study revealed that the consequences of corporate farming are disastrous, farmers have lost their land, the only source of their livelihood and this had led to land concentration. Large scale mechanization was introduced to reduce the cost of production of crops. This had robbed the employment of peasants and labour. The changed cropping pattern and export oriented agriculture under corporate farming threatened food security. The corporate farming would destroy the present farming which had been the practice for generations. In contract farming type II, the company supplied all the production requisites to the farmer and the farmer would had to sell their products to the company only. In this agreement the details about the quality were not usually mentioned. The important issue in this type of farming was 'who will fix the price for the product'. A study conducted in Zaheerabad, Medak district of Andhra Pradesh revealed that contract farming to some extent had affected the farmers. The VST company which supplied inputs to the farmers has refused to purchase the produce on the plea of inferior quality. The decision of the company is unilateral. In another example, Mahyco, Mansanto Co., entered into an agreement with farmers in Kurnool district, Andhra Pradesh for cotton seed production and as per

the agreement, the farmers raised the seed. The company paid a meager amount ofRs. 250/- per bag of 750 gross, where as it had sold the seed of 450 gross for Rs. 1650/- which was a clear case of exploitation by the company under contract farming. The price risk was not actually covered under this type of farming. The inherent danger in this type of farming was that whatever inputs and technology the company had the same would be supplied to the farmer. The company had upper hand on all the transaction since the farmer's bargaining power was very weak. It was suggested that the contract farming should to bring under legal frame work.

Singh (2006) conducted a study on Contract Farming for Agricultural Development: Experience of the Indian Punjab and Northern Thailand. He observed in his study, "Contract farming, in a political economy, was one mode of capitalist penetration of agriculture for capital accumulation and exploitation of the farming sector by agribusiness companies."

Chaudhary (2006) observed that If contract farming becomes the norm, then people would lose food security. They (the corporates) would tell what crops to grow and they would give us the inputs as well. Except for labour and land, farmers didn't have any role to play in contract farming. He continued, "One also had to understand that with about 70 per cent of the population dependent on agriculture, it was not just a trade in our country. It was a way of life. The government should seriously weigh the pros and cons, and involve the farmers in policy making."

CHAPTER-III

SOCIO ECONOMIC FEATURES

SOCIOECONOMIC FEATURES OF THE STUDY AREA

Odisha

Odisha is the eighth largest State in the Country and 11th most populous State with a population of 41 million. It makes up 3.4% of country's population. It has a landmass of 1, 55,707 sq. kms, which is 4.74 per cent of India's landmass. The State has 30 districts, 58 Sub Divisions, 317 Tahasils, 314 Community Development Blocks, 103 Urban Local Bodies, 6,234 Gram Panchayats and 51,349 villages (47,529 inhabited and 3,820 un-inhabited.

The state is richly endowed with a variety of natural resources like minerals, forests, a long coast line, sea, large water bodies-both sweet and brackish, rivers and rivulets and a rich cultural heritage offering a wide range of fine manifestations having both aesthetic and commercial value. The state is situated on the south eastern part of India with its coastal length of 476 km adjoining to Bay of Bengal. On the basis of topography, climate and soil types the state is divided into ten agro-climatic zones. Its land can be classified into three categories: low (25.6%), medium (33.6%) and up-lands (40.8%) with different types of soil like red, yellow, red -loamy, coastal alluvial, laterite and black soil etc. with low and medium texture.

Agriculture is the mainstay of the State economy providing livelihood support to a large section of the population. Odisha's economy is dominated by agriculture and allied sub-sectors that contributed more than70 percent of the Gross State Domestic Product (GSDP) in the 1950s.

The State's economy diversified at a slow pace for a long period of time but the process has accelerated in recent years. As per "Quick Estimates", this sector, which includes agriculture, animal husbandry, fisheries and forestry, contributed 17.59 percent of GSDP as against 14.51 percent at the national level in 2010-11. It provides employment and sustenance, directly or indirectly, to more than 60 percent of the State's total work-force. In this sense, the Agriculture Sector is still the "mainstay" of Odisha's economy. It is, therefore, important to understand structure changes in the growth patterns of the sector so that appropriate strategies may be devised to divert a substantial proportion of the agricultural workforce from farm to non-farm sectors and in turn help the economy grow at faster and higher rates. This would also help reduce poverty at a faster rate. This chapter reviews the performance of agriculture, animal resources, fisheries and forestry sub-sectors.

Development of Agriculture in Odisha has lagged behind due to several constraints, like traditional method of cultivation, inadequate capital formation, low Investment, inadequate irrigation facilities and uneconomic size of holdings. This dominant sector of the State's economy has become, more often than not a helpless victim of natural calamities like flood, drought and cyclone. Even if the state gets 1489mm.rain fall per annum, about 80 per cent of the total rain fall occurs in four months i.e. June to September. This uneven distribution of rain fall affects cropping pattern, intensity, production and productivity of crop in the state. For sustaining economic development, much emphasis has been laid in the planning process for accelerating the pace of agricultural development. The State Government has developed a comprehensive Agricultural Policy during 2008.The policy is intended to help rejuvenating the Agricultural Sector of the state and bringing improvement in the economic conditions of farmers. One of the

objectives of the new Agricultural policy is to encourage contract as well as compact farming and to facilitate appropriate market linkages for agricultural produce with respect to which the state has competitive advantage.

Table- 3.1 Number of Sub-Divisions, Blocks, Tahesils, Gram panchayats and Villages in the Selected District and the State

District	No. of Sub-division	No. of blocks	No. of Tahasils	No. of GP	No. of villages
Dhenkanal	3	8	8	198	1215
Odisha	58	314	317	6234	51349

Source: District Statistics of Dhenkanal, Directorate of Economics and Statistics, Odisha.

Table- 3.2 Demographic feature of the selected district and Odisha Population (in 000' nos.)

District	Male	Female	Total	% of total population	Urban	% of total population	Rural	Density of population
Dhenkanal	612	580	1192	9.82	117	90.18	1075	268
Odisha	41947	21201	20745	33.75	7003	66.25	34970	269

Source: District Statistics of Dhenkanal, Directorate of Economics and Statistics, Odisha.

Table- 3.3 Literacy percentage in the Selected District and Odisha.

District	Male	Female	Total
Dhenkanal	87.08	71.40	79.41
Odisha	82.40	64.36	73.45

Source: District Statistics Dhenkanal, Directorate of Economics and Statistics, Odisha.

Table- 3.4 Population by caste of livelihood classes of selected district and Odisha

District/ state	Population (in '000 nos)			Population according to livelihood classes			% of workers to total population
	SC	ST	Total	Cultivators	Agril. labourers	Total workers	
Dhenkanal	197	136	1067	77.450	67.009	356.513	33.41
Odisha	6082	8145	36804	3435.170	2098.158	14276.488	38.79

Source: A profile on Agriculture in Odisha, 2010, Directorate of Agriculture & Food Production, Odisha

Table- 3.5 Available infrastructure of the district and Odisha

District	Total household	Total villages	Villages electrified	% of total villages	Total road (in km)	Km/thousand population
Dhenkanal	222023	1076	995	92.47	7103	6.66
Odisha	7738065	46989	38044	80.96	237000	6.44

Source: Statistical Abstract of Odisha, Directorate of Economics and Statistics, Odisha.

Table- 3.6 Average rain fall and maximum and minimum temperature of the selected district and Odisha in Kharif and Rabi Season

District	Rainfall (in mm)	Temperature	
		Kharif	Rabi
Dhenkanal	1589.3	35°C, 22°C	30°C, 14°C
Odisha	1489	37°C, 19°C	34°C, 10°C

Table- 3.7 Land utilization pattern of the district & Odisha (Area in 000' ha)

Types of land use	Dhenkanal	Per cent	Odisha	Per cent
Geographical area	460	100	15571.00	100
Forest area	174	37.82	5813.00	37.55
Miscellaneous tree	8	1.73	482.00	0.95
Permanent pastures	10	2.17	443.00	2.75
Culturable waste	5	1.08	392.00	2.75
Land put to non-agriculture use	20	4.34	999.00	4.18
Barren and unculturable waste	10	2.17	843.00	5.02
Current fallow	27	5.86	426.00	1.31
Other fallow	40	8.69	434.00	2.39
Net area sown	166	36.08	5739.00	43.06

Table- 3.8 Type of Cultivated Land in the district (in 000' ha)

District	Lowland	Medium land	Upland	Total
Dhenkanal	41.00 (21.24)	55 (28.50)	97 (50.26)	193 (100)
Odisha	1557.00 (25.26)	1914 (31.04)	2694 (43.70)	6165 (100)

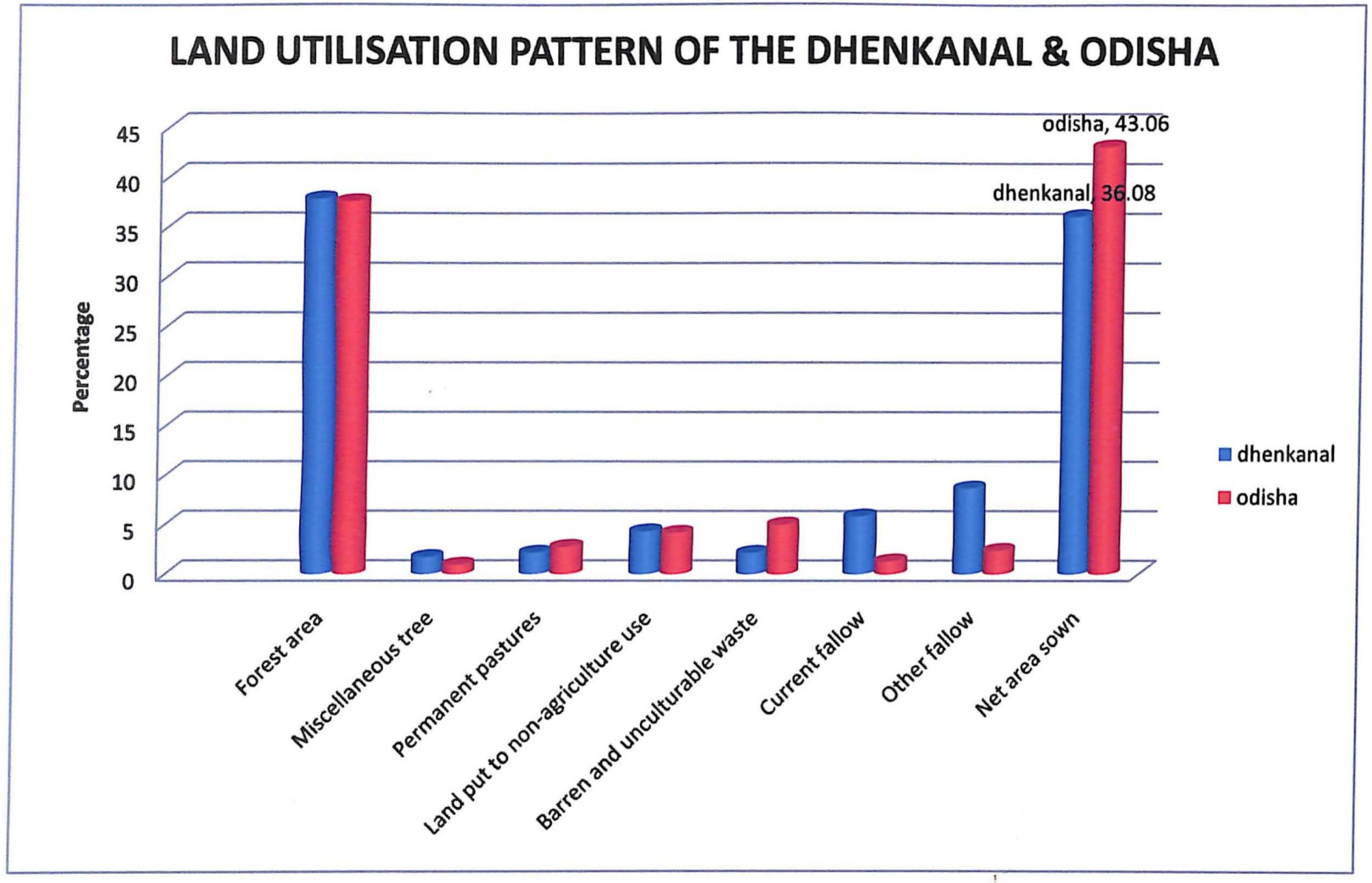

LAND UTILISATION PATTERN OF THE DHENKANAL & ODISHA
Percentage
45
40
35
30
25
20
15
10
5
0
odisha, 43.06
dhenkanal, 36.08
Forest area
Miscellaneous tree
Permanent pastures
Land put to non-agriculture use
Barren and unculturable waste
Current fallow
Other fallow
Net area sown
dhenkanal
odisha

Table- 3.9 Land holding size in Selected District (in '000 ha)

District	Marginal (<1) (in '000ha)		Small (1-2) (in '000ha)		Semi medium (2-4) (in '000ha)		Medium (4-10) (in '000ha)		Large (>10) (in '000ha)		Avg. size
	No.	Area	No.	Area	No.	Area	No.	Area	No.	Area	
Dhenkanal	34-32	20.5	31.3	45.2	16.5	44.1	3.6	19.5	0.246	4.7	1.56
Odisha	2294.5	1155.1	1113.6	543.7	500.5	1344.2	145.1	817.6	13.4	220.4	1.25

Table- 3.10 Gross cropped area, net cropped area and cropping intensity of selected district and Odisha (Area in 000 ha 2011-12)

District/ state	Net cropped area	Gross cropped area	Cropping intensity
Dhenkanal	165	265	161
Odisha	5407	8565	158

Source: Odisha Agril. Statistics, 2011-12,Directorate of Agriculture & Food Production, Odisha

Table- 3.11 Source wise irrigation potential created up to 2011-12 (Area in 000' ha)

District	Major		Minor		Lift		Sources others		Total	
	Khairf	Rabi	Khairf	Rabi	Kharif	Rabi	Kharif	Rabi	Kharif	Rabi
Dhenkanal	25.61	7.81	20.91	4.68	12.15	6.51	14.37	15.60	73.04	34.60
Odisha	1250.50	563.26	519.02	71.35	421.19	234.28	530.79	449.66	2721.50	1318.52

Source: Odisha Agricultural Statistics, 2011-12

Table- 3.12 Banking facility available in the Selected District

District	Commercial banks	Public sector banks	R.R.Bs	Private banks	Total	Bank branches/ thousand population
Dhenkanal	63	36	27	-	126	8468
Odisha	2735	1518	849	47	5149	7148

District: Dhenkanal

The district of Dhenkanal lies between 85°58' to 86°2' East to 20°29' to 21°11' North with its geographical area of 4452 Sq.Km. The district is bounded by Cuttack district in south, by Cuttack and Angul in west, by Keonjhar district in north and Jajpur district in the east. It comes under mid central Table Land Agro-climatic zone of the state. There are 8 blocks and 198 gram panchayats comprising of 1215 villages. One

MAP OF DHENKANAL DISTRICT

Municipality and 2 NACs are in the district. The district is having 3 Sub-divisions and 8 Tahasils. This district comprises of 2.86per cent of land area of Odisha with population of 1192 thousand. Out of which only 9.82 per cent are urban population and rest 90.18 per cent live in rural area. This district has got 1215 villages with 222 thousand households.

There are 63 scheduled commercial banks in the district out of which 36 are public sector banks and 27 are regional rural banks. There is one bank branch per 8468 people. The district has got 79 per cent literacy rate which is 6 per cent higher than the state average. The total geographical area of the district is 460 thousand hectares and the net area sown is 166 thousand hectares (Table-4.7).The cropping intensity of the district is 161 per cent. The demographic features of the district are given in the (Table-4.2).It is one of the most important district and thickly populated districts in the State. The density of population of this district is 268 per sq.km.

In spite of the fact that Dhenkanal is one of the most important industrial district of Odisha with numerous factories, the most important being Sakti sugars which is the largest sugar factory in the private sector to boost the sugar cultivation in the district and in the adjoining districts. It is under Dhenkanal Agriculture district and Angul Agriculture zone. The district experiences an oppressive summer season, profuse rains and high humidity. The year may be divided into four seasons-hot summers from March to May, South west monsoon from June to September, post monsoon from October to first half of November and the cold season rest of the period. The highest temperature in Kharif season touches 35°C and minimum in Rabi comes down to 14°C.

Though paddy is the main crop of the district, the agricultural economy largely depends on sugarcane and vegetables and orchards. Sugar cane has become one of the important cash crops in the blocks like Dhenkanal sadar, Hindol and Kankadahad due to location of sugar

factory in the district. In the district 73 thousand hectares can get irrigation where as only 34 thousand hectares can be irrigated in rabi season. The average size of operational holding is 1.56 hectares Out of the 356 thousand workers in the district 77 thousand are cultivators and 67 thousands are agricultural labourers. About 33 per cent of the total populations are workers. The block headquarter are at a distance from 25 to 70 km from district headquarter. About 50 per cent of the lands are up lands followed by 29 per cent medium land and 21 per cent low land. About 90 per cent of the villages are electrified and about 7 K.m. road net work per thousand populations. But per hectare consumption of fertilizer is 32.27 kg. in comparison to state average 62.80 kg. in the year 2011-12 Agricultural year.

Table- 3.13 Cropping pattern in 000" ha in the year 2011-12 (Dhenkanal)

Sl. No.	Crops	Kharif	Rabi	Total	Percentage
1.	Total rice	112.2	1.52	113.72	45.05
2.	Total cereals	115.15	1.98	117.13	46.40
3.	Total pulses	23.21	42.37	65.58	25.98
4.	Total oilseeds	21.79	14.08	35.87	14.20
5.	Total fibre	1.65	-	1.65	0.65
6.	Sugarcane	1.30	-	1.30	0.52
7.	Total vegetable	10.63	14.38	25.01	9.91
8.	Total spices	1.82	4.08	5.90	2.34
9.	Total area	174.25	78.19	252.44	252.44

Table- 3.14 Consumption of fertilizers in Dhenkanal and Odisha (2011-12)

District/ state	GCA (000' ha)	Consumption of fertilizers (in tones)				Per ha. Consumption in kg
		N	P	K	Total	
Dhenkanal	252.45	4401	2434	1314	8149	32.27
Odisha	8623.49	293.43	149.85	75.82	52180	62.80

Table- 3.15 Information regarding selected block

Block	No. of gram panchayats	Cultivated area in 000' ha				Net area sown	Gross cropped area	Cropping intensity
		High	Medium	Low	Total			
Dhenkanal Sadar	27	13	10	9	32	30	42	140

Table- 3.16 Block wise irrigation potential created up to 2011-12

Block	Irrigation potential created (area in ha.)							
	Major / Medium		Minor Flow		Minor Lift		Total	
	Kharif	Rabi	Kharif	Rabi	Kharif	Rabi	Kharif	Rabi
Dhenkanal Sadar	-	-	738	-	240	216	978	216

Table- 3.17 Fertilizer consumption in the block (2011-12)

Block	N	P	K	Total	Consumption kg/ha
Dhenkanal Sadar	462	224	117	802	20

Source: A profile on Agriculture in Odisha 2011, Odisha

Study Block

Dhenkanal Sadar

Dhenkanal Sadar block was selected randomly from among eight blocks in the district for our study. The total population of the block is 137 thousand living in 29417 households with 395.69 Sq.Km. of geographical areas. The block is located in one side of Dhenkanal district. It is surrounded by Cuttack district in south and east, Gandia block in north, and Hindol block in west. The block is having 27 Gram panchayats. The total gross cropped area of the block is 42 thousand hectares but the net cropped area is 30 thousand hectares. The cropping intensity of the block was 140 per cent. The block is having limited irrigation potential. Only 738 hectares can be irrigated in kharif season by minor flow. Whereas 240 and 216 hectares can be irrigated by minor lift in kharif and rabi seasons respectively. Due to limited irrigation potential the fertilizer consumption is only 20 kgs per hectare.

CHAPTER-IV

RESEARCH METHODOLOGY

RESEARCH METHODOLOGY

This chapter is concerned with the description on research methods and techniques design of research, sampling design, methods of data collection, the empirical measures developed and techniques used to measure the variables and concept, and finally the statistical procedures employed in the analysis of data.

The study had been conducted based on primary data on contract farming for one crop i.e. sugarcane grown in Dhenkanl district. The secondary data such as district profile and other agricultural statistics had been collected from various issues of Odisha economic review and Odisha Agricultural statistics.

Design of research

The study had been based upon the survey method. In this method, a group of individuals were sampled and their responses to the questions they were asked were recorded. This was done through interviewing method. Structured schedules were used to collect the relevant information from the individuals. More specifically in this method, the interviewer contacted the respondents, asked questions and filled in the schedules according to the responses.

Selection of district

There are 30 districts in Odisha. The selection of districts for in depth

study was done as follows. The study was undertaken in Dhenkanal District of Odisha purposively, where contract arrangements were being followed for sugarcane crop. The primary data for analysis pertain to the year-2011-12.

Selection of block

Then one block from Dhenkanal district was purposively chosen having maximum contract farmers for sugarcane. Thus Dhenkanal Sadar block from Dhenkanal District was selected for the purpose of our study.

Selection of villages and house hold

Then two villages from the block were selected at random. Thus Korian and Sankarpur villages of Dhenkanal Sadar Block were selected. A complete enumeration of the farmers of these two villages was made. The farmers were then stratified as contract and non contract farmers. Then both i.e. contract and noncontract farmers were further stratified into three size groups i.e. Marginal Farmer (below 1 ha), Small Farmer (1-2 ha) and Large Farmer (more than 2 ha). From these categories 48 farmers representing all the size groups were selected randomly on probability proportion. A total number of 24 farmers from contract and another 24 from non contract farmers were thus selected from each district representing sugarcane crop. A total number of 48 farmers were selected from the state for final analysis.

Tools and techniques of data collection

Development and pre-testing of the survey schedule

The primary data had been collected with the help of a survey schedule specially constructed for the purpose of this study, keeping in view the focus, objectives and variables. The entire draft schedule had been pre-tested with ten per cent non-sample respondents before administering into the actual respondents. Pre-testing had been done to ensure the validity of the survey schedule under local condition. Accordingly, after the completion of the pre testing, the final survey schedule had been revised and improved with appropriate wordings and contents.

Interviewing and data collection

Primary data had been collected by personal interview of the growers. A household schedule was specially developed for collection of data from the household. The household schedule included different sub-sections. Under the item general information, the socio-economic status of the farm families at a particular point of time had been recorded. It included data on family size, employment status of the family members, and size of holdings.

The information in respect of cropping pattern had been recorded. Labour use per hectare in sugarcane, input cost and returns of crop had been recorded.

Secondary data had been obtained from published reports and official records of the Directorate of Agriculture, Government of Odisha, Junior Agricultural Officers of respective blocks and other agencies.

The survey schedule

The household survey schedule had six parts which were as follows.

General information:

This included some basic data for identifying the respondents such as name, address, size of the family. Educational status of the respondents had been measured by the help of scale composed of illiterate, primary, up to secondary, up to higher secondary, graduate/post graduate. The occupation of the respondents had been incorporated in the general information along with the number of persons engaged in agricultural operation. In this part the income of the farming households both main and subsidiary had also been included to know the basic situation of a particular farm.

Land account:

The size of holding separately for owned land, leased-in land and leased-out land had been recorded. The irrigational status by seasons and sources had also been collected to see the land situation of the particular farm.

Crop information:

This includes the cropping pattern and production of different crops. In this section the total consumption of farm produce had also been recorded to see the surplus if any of a particular farm.

Cost of cultivation:

The cost of cultivation i.e. the cost of human and bullock labour and tractor/machinery along with the costs of seed, manure, fertilizer, irrigation charges etc. had also been recorded in this part.

Contract arrangements

The terms of contract with company and the type of support services such as supply of seed, fertilizers and other inputs, technical advice etc. provided by the companies to the farmers were dealt in this part.

Conflicts and constraints

The conflicts between the farmers and contracting companies if existed what were the factors that stand against the contract practices had been identified. The constraints faced by the farmers had also been noted in this part.

Analytical Techniques

The overview of the procedures applied in this study was presented below. The complete analytical procedure could be divided into two broad areas.

(a) First of all structure of sample farms, size of holding, type of owner ship of land, extent of irrigation, cropping pattern, copping intensity were worked out.

(b) Based on growers' data for the year 2011-12, average cost of production, was worked out. Extent of input use for sugarcane crop was analyzed by using the primary data collected from sample households.

After scrutiny, the collected data had been processed to fulfill the objectives laid down for the study. The processing of data had been done by manual tabulation as well as by the help of computer. Different

econometric techniques had been applied to fulfill the various objectives. Cost of cultivation in both contract and non contact situation had been worked out for analytical interpretation of data. The significance of the results obtained from the various economic techniques had been statistically tested for generalization of the objectives. The detail analyses which were employed to fulfill the various objectives are discussed as follows:

1) To fulfill the first objective i.e. to examine the cost and return of contract vis-à-vis non contract farming different cost concepts were compared by using tabular analysis

2) To fulfill the first objective, to study the input use efficiency for both the crops under contract and non contract situation, Cobb Douglas Production Function was used.

3) To fulfill the second objective, to prioritize different constraints in contract farming, Garrett's ranking technique had been used.

Statistical tools used

The following statistical tools had been employed in the study for precise and better analysis and interpretation of the data collected. These are briefly discussed as follows:

Frequency and percentages

Simple comparison had been made on the basis of frequency and percentage.

Cropping intensity

Cropping intensity for a particular year and for a particular size of farm had been calculated by the following formula.

$$C_j = \frac{G.C.A}{N.C.A.} \times 100$$

Where, Cj = Cropping intensity, G.C.A = Gross cropped area

N.C.A = Net cropped area

Cost of cultivation

The cost of cultivation of a particular crop 'a' can be expressed through the following identity.

$$Ca = r_1 x_1 + r_2 x_2 + r_3 x_4 + r_5 x_5 + r_6 x_6 + r_7 x_7 - r_8 x_8$$

Where, C_a = Cost of cultivation of crop 'a' (in Rs.)

X_1= Human labour requirement

X_2 = Bullock labour requirement

X_3 = Tractor/Machinery requirement

X_4 = Seed requirement

X_5 = Manure requirement

X_6 = Fertilizer requirement

X_7 = Plant protection requirement

X_8 = Irrigation charges

and r_1, r_2 .....r_x arc the respective prices.

Resource-use efficiency

To analyse the resource-use efficiency and resource productivity of different inputs, the production function analysis was conducted. The Cobb-Douglas production function was selected to establish the input-output relations with output (yield) of the crop as the dependent variable and human labour, farm power, fertilizer, irrigation, and plant protection

measures were adopted as the independent variables. It was applied in the form of equation-

$$Y = a \; x_1^{b_1} \; x_2^{b_2} \; x_3^{b_3} \; x_4^{b_4} \; x_5^{b_5} \; x_6^{b_6} \; x_7^{b_7} \; x_8^{b_8} \, U$$

Where,

Y is the crop yield (kg/ha)

a is a constant or intercept

b_1, b_2 .... B_n are Regression coefficients

X_1, X_2, X_3..... X_n are input factors (independent variables) and

U is the error term

Where,

Y	= Crop yield (kg/ha)
a	= Constant
$b_{1\text{-}8}$	= Regression coefficients
X_1	= Human labour (Rs/ha)
X_2	= Farm power (Rs/ha)
X_3	= N+P+K fertilizer (kg/ha)
X_4	= Irrigations (No.)
X_5	=Plant protection (Rs/ha)
U	= Random error term

Garrett' ranking technique

Garrett's ranking technique in the following manner

$$\text{Percentage position} = \frac{100\,(R_{ij} - 0.50)}{N_j}$$

Where,

R_{ij} = Rank given for the ith item by the jth individual, and

N_j = Number of items ranked by the jth individual

The percentage of position of each rank was converted into scores using Garrett table. For each constraint, scores of individual respondents were added together and were divided by total number of respondents for whom scores were added. Thus, mean score for each constraint was ranked by arranging them in the descending order.

Cost Concept

The cost concepts generally used in Hum management studies viz. cost A_1, cost A_2, cost B_1, cost B_2, cost C_1, cost C_2 were considered in the present study.

Cost A_1 = Cost of hired human labour and attached labour
+ Cost of hired and owned bullock labour
+ Cost of hired and owned machine charges
+ Cost of pesticides, seeds, manures & fertilizers
+ Depreciation, repair and maintenance of implements and farm building
+ Irrigation charges
+ Land revenue, cesses and other taxes
+ Interest on working capital
+ Transportation charges

Cost A_2 = Cost A_1 + rent paid for leased in land

Cost B_1 = Cost A_1 + interest on value of owned capital assets excluding land

Cost B_2 = Cost B_1 + rental value of owned land and rent paid for leased land

Cost C_1 = Cost B_1 + imputed value of family labour

Cost C_2 = Cost B_2 + imputed value of family labour

Farm Business measures

Net income (NI) = Gross Income - Cost C

Family labour income (FLI) = Gross Income - Cost B_2

Farm Business Income (FBI) = Gross Income - Cost A_1

Owned Farm Business Income = Gross Income - Cost A_2

Farm Investment Income (FII) = Farm Business Income - Imputed value of family labour

CHAPTER-V

RESULT AND DISCUSSION

RESULT AND DISCUSSION

The empirical evidences attained from the statistical analysis are discussed under different sections to get a comprehensive understanding on the prospects of contract farming. The results of the present study are discussed in five broad sections.

1. Section-I : - This section describes the general characteristics of the sample farms.
2. Section-II : - It provides analysis of the production cost and measures of farm profit of the sample farms.
3. Section-III : - This section discusses the input use efficiency.
4. Section-IV : - This section analyses the constraints of contract farmers and business organization.
5. Section-V : - In this section based on the constraints analyses, various policy measures are suggested for better working of contract arrangement.

SECTION - I

General characteristics of the sample farms

5.1. The sample households

In this section the details about the sample households are discussed. As per the methodology of the study, Dhenkanal district was selected to study contract farming situations for sugarcane crop. Similarly Sadar block of the district was purposively selected for the study from which a

total of 24 contract farmers and 24 non-contract farmers were selected. The socio-economic and other characteristics of these farms has been discussed, analyzed and presented in the following paragraphs.

Table-5.1.1 Family size and occupation of the sample household

Sl. No.	Particulars	Dhenkanal	
		Contract	Non-contract
A.	Average family size	7.42	5.60
B.	Average member engaged in agriculture	2.44 (32.88)	2.46 (43.93)
C.	Main source of income		
1.	Agriculture	20 (83.33)	21 (87.50)
2.	Service	1 (4.16)	-
3.	Business	3 (12.50)	3 (12.50)

Figures in parenthesis represent percentage (%)

Based on the above mentioned table, the average family size of the contract and non-contract farmers in Dhenkanal was 7.42 and 5.60. It is very interesting to note that out of the total members, about 32.88 per cent of the family members of contract farmers of the district were engaged in agricultural operation, whereas about 43.93 per cent of the total family members of non- contract farms were engaged in agriculture. Among the contract farmers, agriculture was found to be the major source of income (i.e. 83.33 per cent of total) followed by 12.50 per cent of the sample households who were dependent on business.

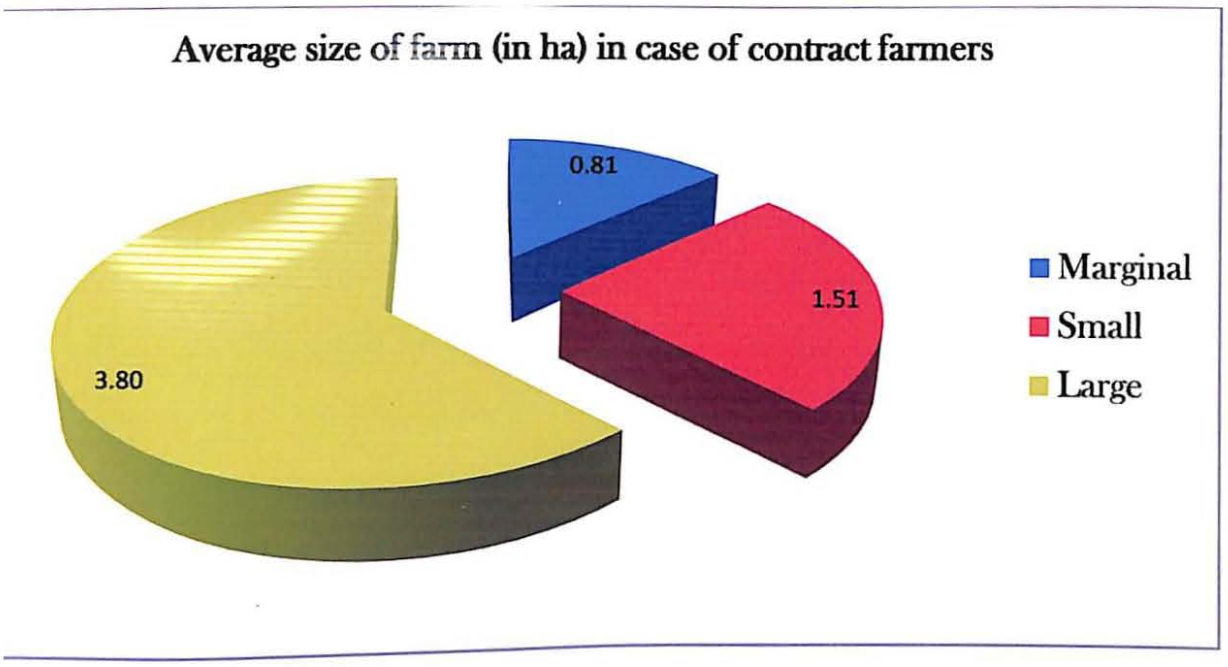
Table-5.1.2 Educational status of the sample households

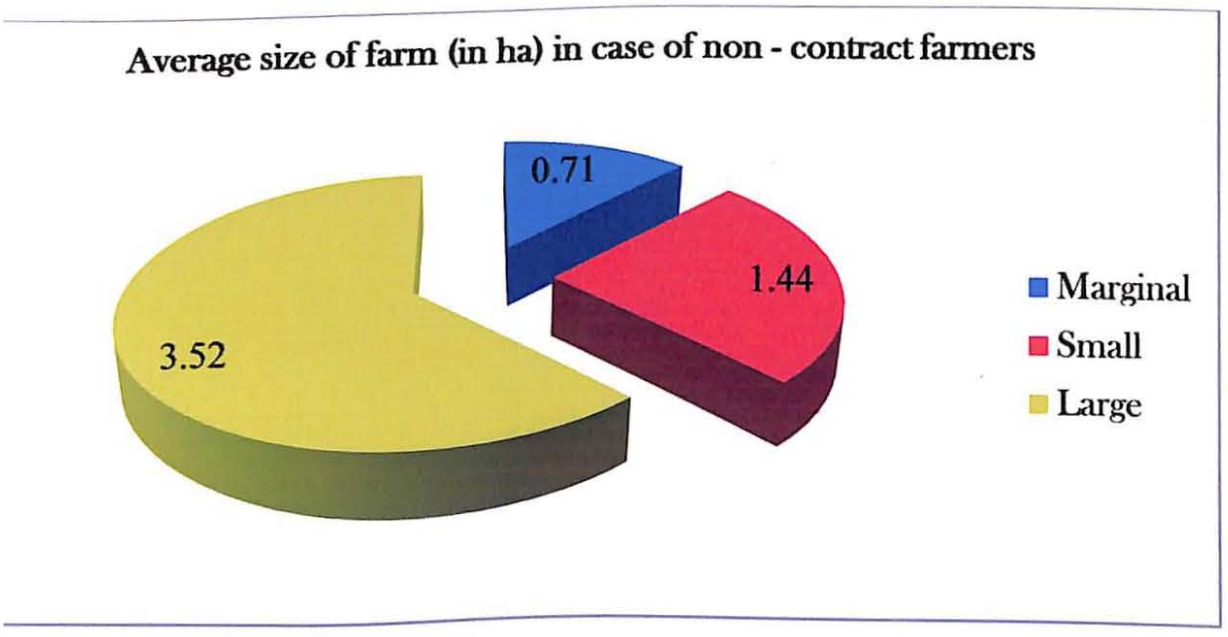
Sl. No.	Educational status	Dhenkanal	
		Contract	Non-contract
1.	Illiterate	-	-
2.	Primary	42.0	66.0
3.	Secondary(VI to X)	44.0	34.0
4.	Higher secondary	12.0	-
5.	Graduate & above	2.0	-
	Total	100.0	100.0

Table -5.1.2 presents the educational status of the sample farmers of the selected block. In general the level of education was found to be high in Dhenkanal. In Dhenkanal, it was observed among the contract farmers that only 2 per cent were Graduates and above, 12 per cent at higher secondary level, 44 per cent at secondary level and 42 per cent at primary level of education. Whereas among the non contract farmers, 66 per cent were at primary level and 34 per cent up to secondary level and none of the sample farmers were illiterate. However, in general the level of literacy was higher among the contract farmers than the non-contract in both the districts.

Table-5.1.3 Average size of the sample farms

Category of farms	Sample size		Average size in ha	
	Contract	Non-Contract	Contract	Non-contract
	%	%		
Dhenkanal				
Upto 1 ha	22.00	32.00	0.81	0.71
1ha-2ha	66.00	44.00	1.51	1.44
Above 2ha	12.00	24.00	3.80	3.52


Average size of farm (in ha) in case of contract farmers
0.81
1.51
3.80
Marginal
Small
Large


Average size of farm (in ha) in case of non - contract farmers
0.71
1.44
3.52
Marginal
Small
Large

The average sizes of the sample farms are depicted in **Tables - 5.1.3.** As stated earlier 24 contract and 24 non-contract farmers each for the district i.e. Dhenkanal was selected for the study for sugarcane crop. The average sizes of farms in Dhenkanal for contract farmers were 3.80, 1.51 and 0.81 hectare for large, small and marginal farms, respectively. It had also been found out that the overall average size of the sample farms in non-contract size groups vary from 0.71 ha for marginal to 3.52 ha for large size groups of farms. It indicates that the inter-size group variation in average size in between the different categories of farms was quite significant.

Table- 5.1.4 Irrigation status of the sample farms in Dhenkanal District

Category of farms	Operational area in ha	Irrigation status	
		Area irrigated	Percentage of the operational area
Contract			
Up to 1 ha	0.81	0.44	54.32
1.01 – 2 ha	1.54	0.55	35.71
Above 2 ha	3.80	0.87	22.89
Overall	1.66	0.56	33.73
Non-contract			
Up to 1 ha	0.71	0.30	42.25
1.01 – 2 ha	1.44	0.50	34.72
Above 2 ha	3.52	0.83	23.58
Overall	1.85	0.52	28.11

It is a fact that by and large, high growth in crop production was associated with equally or more impressive expansion in irrigation. The lone common impact of irrigation expansion was the considerable rise in cropping intensity. But, due to limited irrigation facilities in the district

the crop production activities did not exhibited impressive results. Realizing the significance of irrigation, the farmers in Dhenkanal district had taken sugar cane crop mostly in irrigated areas. **Table-5.1.4** indicates that overall 33.73 per cent of the total operational area of contract and 28.11 per cent of operated area of non-contract farmers were under irrigation in Dhenkanal district.

Table-5.1.5 Cropping pattern followed by the sample contract farmers in Sadar block of Dhenkanal dsitrict

Sl. No.	Particulars	Marginal	Small	Large	Pooled
1.	Kharif Paddy	0.37 (28.24)	0.87 (41.23)	2.93 (61.43)	0.88 (41.71)
2.	Sugarcane	0.44 (33.59)	0.55 (26.07)	0.87 (18.24)	0.56 (26.54)
3.	Kharif Total area	0.81 (61.83)	1.42 (67.30)	3.80 (79.66)	1.44 (68.25)
4.	Sugarcane	0.44 (33.59)	0.55 (26.07)	0.87 (18.24)	0.56 (26.54)
5.	Rabi Green gram	0.04 (3.05)	0.03 (1.42)	0.03 (0.63)	0.03 (1.42)
6.	Rabi Black gram	0.00 (0.00)	0.01 (0.47)	0.00 (0.00)	0.01 (0.47)
7.	Rabi Mustard	0.00 (0.00)	0.02 (0.95)	0.00 (0.00)	0.01 (0.47)
8.	Rabi Vegetable	0.02 (1.53)	0.07 (3.32)	0.07 (1.47)	0.06 (2.84)
9.	Horse gram	0.00 (0.00)	0.01 (0.47)	0.00 (0.00)	0.01 (0.47)

10.	Rabi Total area	0.50 (38.17)	0.69 (32.70)	0.97 (20.34)	0.67 (31.75)
11.	Gross cropped area	1.31 (100.00)	2.11 (100.00)	4.77 (100.00)	2.11 (100.00)

Figures in parenthesis indicate percentage (%)

Table-5.1.6 Cropping pattern followed by the sample non-contract farms in Sadar block of Dhenkanal

Sl. No.	Particulars	Marginal	Small	Large	Pooled
1.	Kharif Paddy	0.41 (38.32)	0.93 (46.73)	2.37 (51.08)	1.12 (47.46)
2.	Sugarcane	0.30 (28.04)	0.50 (25.13)	0.83 (17.89)	0.52 (22.03)
3.	Kharif Arhar	0.00 (0.00)	0.01 (0.50)	0.00 (0.00)	0.00 (0.00)
4.	Kharif Groundnut	0.00 (0.00)	0.00 (0.00)	0.32 (6.90)	0.08 (3.39)
5.	Kharif total area	0.71 (66.36)	1.44 (72.36)	3.52 (75.86)	1.72 (72.88)
6.	Sugarcane	0.30 (28.04)	0.50 (25.13)	0.83 (17.89)	0.52 (22.03)
7.	Rabi Green gram	0.06 (5.61)	0.05 (2.51)	0.07 (1.51)	0.05 (2.12)
8.	Rabi Vegetable	0.01 (0.93)	0.02 (1.01)	0.22 (4.74)	0.07 (2.97)
9.	Rabi total area	0.36 (33.64)	0.55 (27.64)	1.12 (24.14)	0.64 (27.12)
10	Gross cropped area	1.07 (100.00)	1.99 (100.00)	4.64 (100.00)	2.36 (100.00)

Figures in parenthesis indicate percentage (%)

Based on the tables mentioned above, it is revealed that there exist significant differences in cropping pattern in the district. Paddy and sugarcane were found to be the dominant crops in Dhenkanal. As seen from the table among the contract farmers overall 41.71 per cent of the operated area was under kharif paddy followed by 26.54 per cent sugarcane and 2.84 per cent rabi vegetables. Among the non-contract farmers, the major crop was kharif paddy occupying overall 47.46 per cent of operational area followed by 22.03, 3.39 2.97 and 2.12 per cents of sugarcane, groundnut, vegetables, and green gram, respectively.

In aggregate level, it has been found that paddy, by and large, dominated the entire cropping pattern. In Dhenkanal, sugarcane was preferred by the farmers due to proximity of the Sakti Sugar Pvt. Ltd. which is located in Dhenkanal town. The sugarcane crop was grown mostly in irrigated condition and most of the irrigation is from shallow tube well and minor lift points. Sugarcane is grown under the category of cash crops with the intention of getting higher profit from the crop.

Table No-5.1.7 Cropped area and intensity of cropping of the sample farms in Dhenkanal District

Category of farms	Net cropped area in ha	Gross cropped area in ha	Cropping intensity (%)
Contract			
Up to 1 ha	0.80	1.31	163.75
1.01 – 2 ha	1.54	2.11	137.01
Above 2 ha	3.90	3.84	98.462
Overall	1.66	2.11	127.11
Non-contract			
Up to 1 ha	0.74	1.07	144.59
1.01 – 2 ha	1.54	1.99	129.22
Above 2 ha	3.90	4.64	118.97
Overall	1.85	2.36	127.57

In studying the standard of crop husbandry, the first and foremost things to know is the pattern of crops grown. It has been found that a variety of crops is grown in these farms. The cropping intensity is only 127 percent for both contract and non-contract farmers in Dhenkanal district. But the important feature in respect of crop pattern is the allocation of a very large area to paddy. Irrespective of farms, the relative share between food grain crops (rice) and non-food grain crops (vegetables, potato, mustard etc.) is very heavily tilted towards the former with more than 65 per cent of the gross cropped area under food grain crop. The second important feature is that the tendency towards cultivation of commercial crops. It is evident from the fact that the area under sugarcane in Dhenkanal indicate that due to easy marketing and higher profitability farmers grow this crop in their respective areas.

In general, it is also pertinent to recognize that all types of shifts of resources across crops or enterprises do not lead to higher degree of diversification. This is particularly true when the resources get concentrated increasingly overtime in only one or two more profitable one over less risky crops. Illustrations of such situations where the paddy dominated cropping pattern which is heavily dominated by only two crops, viz. paddy and sugarcane in Dhenkanal .In view of the above, it has been pointed out that due to the large variety in soil and other infrastructural facilities in the district, it becomes possible to produce many different kinds of crops with a varying acreage and productivity. This allows the farmer to meet the needs for different types or foods, raw materials and the diverse demand for market. Besides, by judicious changes in the quantities of various crops, the harmful effects of uncertainties of agriculture were minimized.

SECTION II

5.2 Economics of sugarcane production

One of the major factors behind successful agriculture can be traced to the economics of crop production and input use pattern of different categories of farms under different crops. At any situation, the relationship of costs to income is very important in any farm categories. Generally, cost is defined as the value of that which must be given up to acquire or .achieve something. Detail study of a particular crop in regards to all financial costs and a benefit accruing to the cultivation of that crop is essential to evaluate for decision whether a particular crop should be cultivated or not and to what extent the benefit generated exceeds its cost etc.

Therefore, for estimating the costs and returns of high value commercial crops of the state, different cost estimates have been used. The primary data for the year 2011-12 were used to work out the various estimates. Different cost concepts are used in farm management studies in India. However in this case, the net incomes over variable and fixed costs as well as cost B and Cost C were estimated for each crop selected for the study. The variable and fixed costs were estimated separately because variable costs are important in determining whether one should produce or how much one should produce and fixed costs are important in making decisions on different practices and different amounts of production. Apart from these estimates, comparison of profitability was also carried out based on the survey data for contract and non-contract farms in the state. The gross income generated from a crop was calculated by summing up the value of the main product as well as by-product of a particular crop. Price of the main product was taken as the actual price at

which the produce was sold by the growers. In case, a farmer did not sell the produce, weighted average price received by other farmers of the same village/block was taken. Cost of cultivation was estimated to include four major components i.e. total cost (TC), variable cost (VC), fixed cost (FC), imputed value of own land and family labour (L and FL). Sum of VC, FC and L gives cost B and sum of all components gives cost C, which are being used in cost of cultivation studies of Government of India. Besides these estimates, three concepts i.e. the net income over variable and fixed cost (NIVF), net income over cost B (NIB) and net income over cost C (NIC) were worked out. NIVF was examined to know the return to the farmer for his land and family labour our, whereas NIB is the return to the farmer for his family labour and NIC is the net profit earned by the farmer for a particular crop. NIVF, NIB and NIC were calculated by deducting variable and fixed cost, cost B and cost C from gross income respectively. The input use pattern for sugarcane crop was also examined in a view to find out the yield potential of these farming apart from technological management and weather condition. However, the assumptions about valuation and charges for various items had been made explicit. The estimates were, therefore, reliable to the extent these assumptions hold true. The detailed estimates regarding crop economics of sugarcane had been worked out for the sample farms.

Economics of sugarcane cultivation

Sugarcane is considered as one of the important cash crops grown in Odisha. It is grown in all the 30 districts of the state. The selected district Dhenkanal occupied 14th position in area (0.75 thousand ha), 12th position in production (48.86 thousand MTs) and 14th position in yield (65145 kg/ha) in 2010-11. The establishment of a sugar factory, Sakti Sugar in Dhenkanal district has increased the prospect of this crop in the

surrounding area. To get uninterrupted cane supply to the factory, it has started contract farming practices and started giving technological support, input supply with the contract of getting their cane after harvest. In the district, sugar cane is grown, in both irrigated and un-irrigated condition. Mostly varieties likeCo-6907, Co-7208, Surya, Co-62175, Co-87044, Bhabani, Uttara etc. are grown in the district.

Therefore it is imperative that a study in the economic aspects of sugarcane cultivation and the cost benefit ratio for both contract and non-contract farmers are of immense help to justify the contract practices. Information on cost of production of sugarcane, resource productivity, return to scale, resource use efficiency and marketing of sugarcane are important for the policy makers and farmers.

5.2.1 Operational cost of cultivation of sugarcane for contract farms in (Rs/ha)

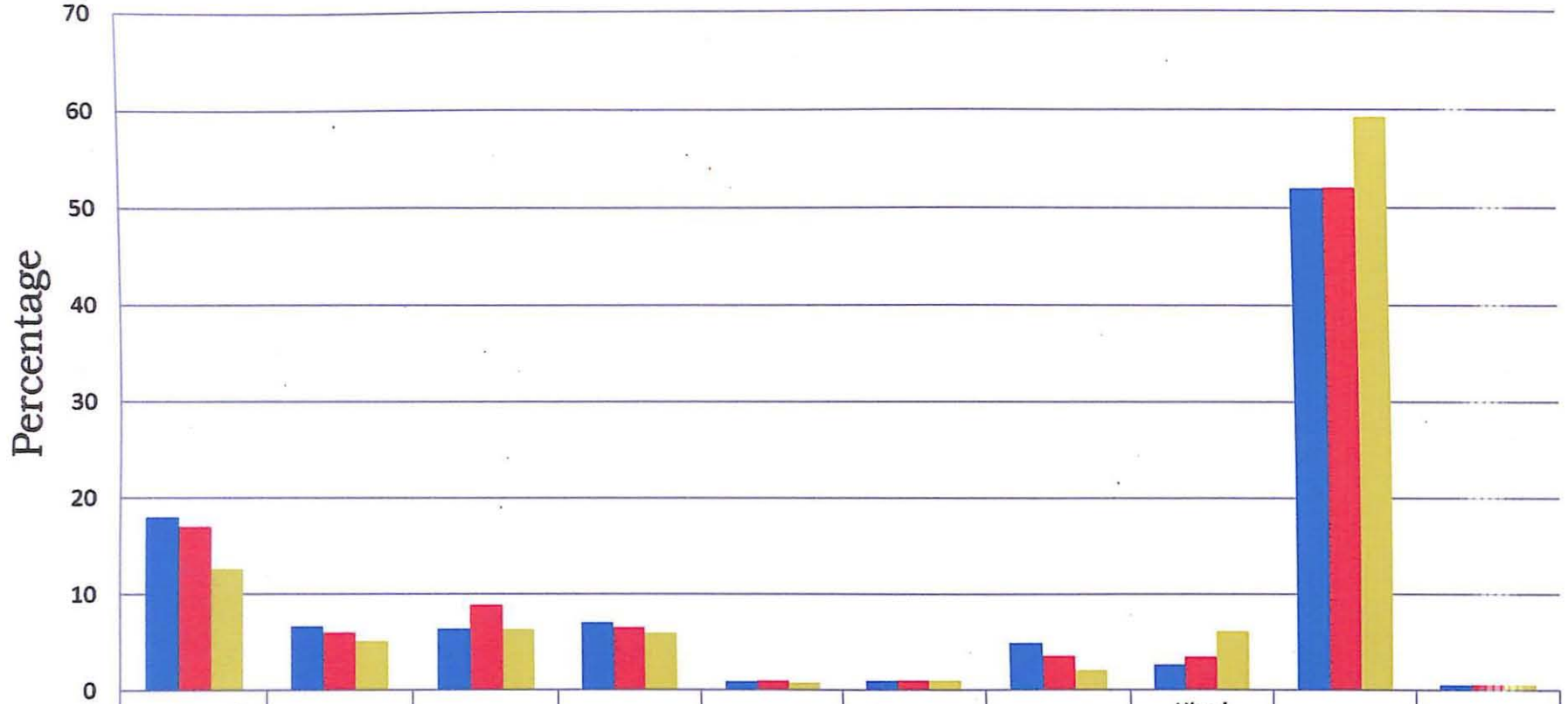
Sl. No.	Particular	Marginal	Small	Large	Pooled
1.	Seed	11000	10742.5	8145	9962.5
2.,	Manure	4057.5	3787.5	3307.5	3717.5
3.	Fertilizer	3895	5600	4095	4530
4.	Irrigation	4302.5	4127.5	3832.5	4175
5.	Herbicide	545	605	500	550
6.	Pesticide	577.5	625	660	600.8
7.	Hired animal labour	3012.5	2257.5	1332.5	2200.8
8.	Hire machine labour	1615	2192.5	3975	2594.2
9.	Hired human labour	31735	32892.5	38217.5	34281.6
10.	Depreciation	317.5	355	380	350.8
	Total (Cost A_1)	61057.5	63185	64445	62895.8

5.2.2 Operational cost of cultivation of sugarcane for contract farms in per cent

Sl. No.	Particular	Marginal	Small	Large	Pooled
1.	Seed	18.02	17.00	12.64	15.83
2.	Manure	6.65	5.99	5.13	5.91
3.	Fertilizer	6.38	8.86	6.35	7.20
4.	Irrigation	7.05	6.53	5.95	6.63
5.	Herbicide	0.89	0.96	0.78	0.87
6.	Pesticide	0.95	0.99	1.02	0.95
7.	Hired animal labour	4.93	3.57	2.07	3.49
8.	Hire machine labour	2.65	3.47	6.17	4.12
9.	Hired human labour	51.98	52.06	59.30	54.50
10.	Depreciation	0.52	0.56	0.59	0.55
	Total (Cost-A_1)	100	100	100	100

It could be seen from **Table No.5.2.1**and **5.2.2** that the operational cost i.e. cost A_1 was higher in case of contract farmers for all categories of farmers. Among the contract farmers the highest cost A_1 was realized by large farmers with Rs.64445 followed by small and marginal with Rs.63185 and Rs.61057.5, respectively. Over all the cost A_1, for contract farmers was Rs.50006.8. Percentage wise cost A_1 indicate that human labour accounted overall 54.50 per cent of total variable cost followed by seed, fertilizer, irrigation and manure respectively.

Cost of cultivation of Sugarcane in case of contract farms (In percentage)



	Seed	Manure	Fertilizer	Irrigation	Herbicide	Pestcide	Hired animal labour	Hired machine labour	Hired human labour	Depreciation
Marginal	18.02	6.65	6.38	7.05	0.89	0.95	4.93	2.65	51.98	0.52
Small	17	5.99	8.86	6.53	0.96	0.99	3.57	3.47	52.06	0.56
Large	12.64	5.13	6.35	5.95	0.78	1.02	2.07	6.17	59.3	0.59

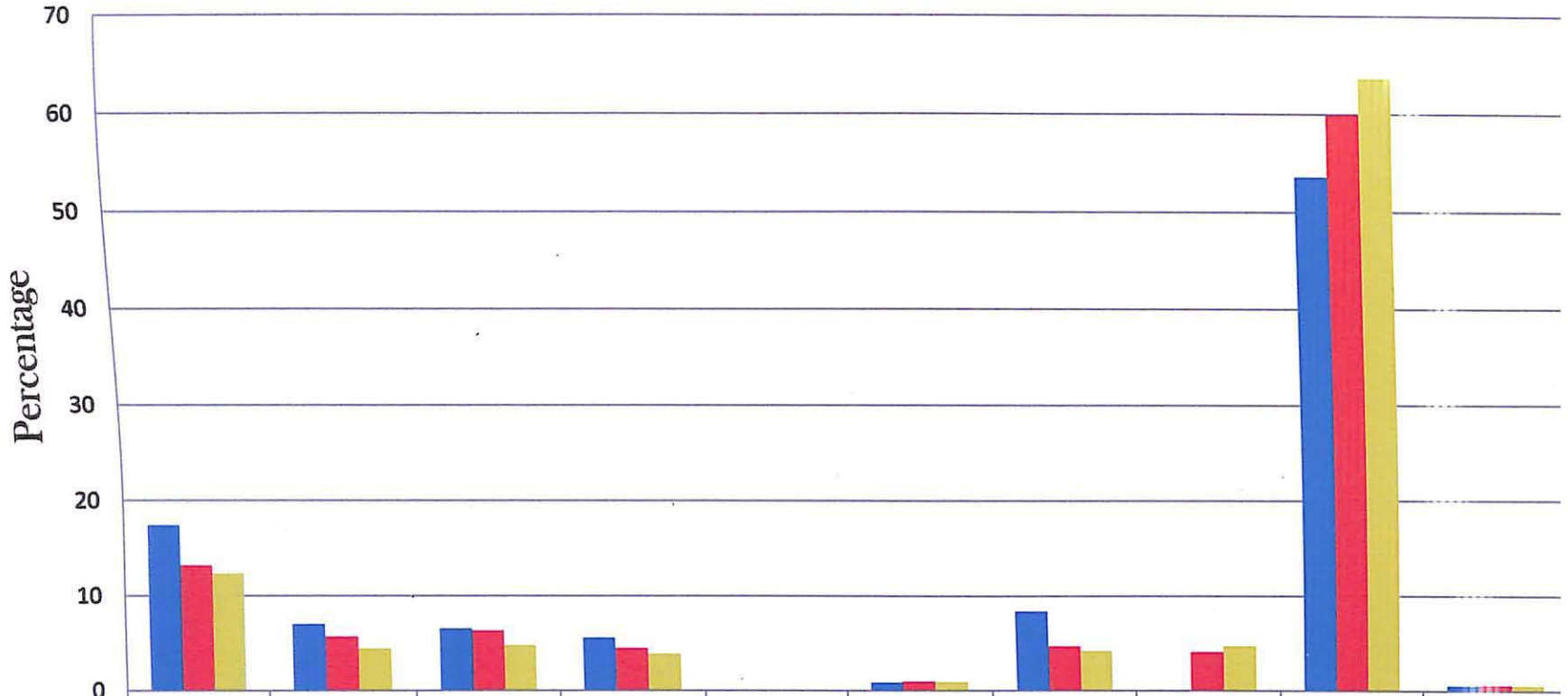
5.2.3 Operational Cost of cultivation of sugarcane for non- contract farms in (Rs/ha)

Sl. No.	Particular	Marginal	Small	Large	Pooled
1.	Seed	8240	7027.5	6725	7330.8
2.	Manure	3327.5	3037.5	2582.5	2982.5
3.	Fertilizer	3105	3367.5	2610	3027.5
4.	Irrigation	2642.5	2387.5	2125	2385
5.	Herbicide	0	0	0	0
6.	Pesticide	412.5	515	512.5	480
7.	Hired animal labour	3972.5	2505	2295	2924.2
8.	Hire machine labour	0	2182.5	2582.5	1588.3
9.	Hired human labour	25380	31950	34700	30676.5
10.	Depreciation	255	317.5	70	314.2
	Total (Cost-A_1)	47335	53290	54502	51709.7

5.2.4 Operational Cost of cultivation of sugarcane for non- contract farms in per cent

Sl. No.	Particular	Marginal	Small	Large	Pooled
1.	Seed	17.41	13.19	12.34	14.17
2.	Manure	7.03	5.70	4.74	5.76
3.	Fertilizer	6.56	6.32	4.79	5.85
4.	Irrigation	5.58	4.48	3.90	4.61
5.	Herbicide	0.00	0.00	0.00	0.00
6.	Pesticide	0.87	0.97	0.94	0.92
7.	Hired animal labour	8.39	4.70	4.21	5.65
8.	Hire machine labour	0.00	4.10	4.74	3.07
9.	Hired human labour	53.62	59.95	63.67	59.32
10.	Depreciation	0.54	0.60	0.60	10

Cost of cultivation of Sugarcane in case of non contract farm(In percentage)



	Seed	Manure	Fertilizer	Irrigation	Herbicide	Pestcide	Hired animal labour	Hired Machine labour	Hired human labour	Depreciation
Marginal	17.41	7.03	6.56	5.58	0	0.87	8.39	0	53.62	0.54
Small	13.19	5.7	6.32	4.48	0	0.97	4.7	4.1	59.95	0.6
Large	12.34	4.47	4.79	3.9	0	0.94	4.21	4.74	63.67	0.6

	Total (Cost-A_1)	100	100	100	100

Among the contract farmers the highest cost A_1 estimated for large farmers with Rs. 54502.5 followed by small and marginal amounting Rs.53290 and Rs.47335 respectively, over all the Among the non contract farmers the highest cost A_1, was estimated for large farmers with Rs54502.5 followed by small and marginal amounting Rs53290 and Rs. 47335 respectively. Overall cost of production was Rs.51709.7. Like the contract farmers, in case of non-contract farms, 59.32 percent of the total cost A_1 was incurred for human labor followed by seed, fertilizer, manure, hired animal labor respectively.

Overall the operational cost incurred by the contract farmers was found to be Rs.11186.6 higher than that of non contract farmers because of the use of improved technology, recommended doses of fertilizer by the contract farmers than the non contract farmers. However, the percentage of cost by non-contract farmers was more for hired animal labor and the use of machine power for the cultivation of sugarcane was less for non contract farmers.

Different cost concepts of sugarcane for contract and non contract farming situation:

After estimating paid out costs for the crop i.e. cost A_1 it was necessary to estimate other costs for calculation profit over various costs. The various costs estimated are costB1 for the crop which included interest on value of own capital assets (excluding land) with cost A_1 or A_2(in the present case Cost A_1 = cost A_2 as there is no leased in land) , cost B_2 includes cost B_1+ rental value of own land (net of land revenue) and rent paid for leased in land, cost C_1, includes, cost B_1+ imputed value

of family labour and cost C_3, which includes cost C_2 +10% of cost C_2 on account of managerial functions performed by farmer.

Table -5.2.5 Measurement of various cost concept among different size group of farmers (Contract)

Sl. No.	Particulars	Marginal	Small	Large	Pooled
1.	Cost A_1	61057.5	63185	64445	62895.8
2.	Rent paid for leased in land	0	0	0	0
3.	Cost A_2 (1+2)	61057.5	63185	64445	62895.8
4.	Interest on own investment (10%)	6105.7	6318	6444	6289.2
5.	Cost B_1 (1+4)	67163.2	69503	70889	69185
6.	Rental value of own land (10%)	6101	6321	6542	6321
7.	Cost B_2 (5+6)	73264.2	75824	77431	33961
8.	Imputed value of family labour	5078	3647	2457	3727
9.	Cost C_1 (5+8)	72241.2	73150	73346	72912.4
10.	Cost C_2 (7+8)	78342.2	79471	79888	79233.7
11.	10% of Cost C_2	7834.2	7947.1	7988.8	7923.3
12.	Cost C_3 (10+11)	88176.4	87418.1	87876.8	87823.7

Table- 5.2.6 Measurement of various cost concept among different size group of farmers (Non-Contract)

Sl. No.	Particulars	Marginal	Small	Large	Pooled
1.	Cost A_1	47335	53290	54502.5	51709.2
2.	Rent paid for leased in land	0	0	0	0

3.	Cost A_2 (1+2)	47335	53290	54502.5	51709.2
4.	Interest on own investment (10%)	4733	5329	5450.2	5170.8
5.	Cost B_1 (1+4)	52068	58619	59952.7	56879.9
6.	Rental value of own land (10%)	4459	4655	4753	4622
7.	Cost B_2 (5+6)	56527	63274	64705.7	61502.2
8.	Imputed value of family labour	5250	4434	2766	4150
9.	Cost C_1 (5+8)	57318	63053	62718.7	61029.9
10.	Cost C_2 (7+8)	61777	67708	64471.7	45310.7
11.	10% of Cost C_2	6177.7	6770.8	6447.1	64652
12.	Cost C_3 (10+11)	67954.7	74478.8	70918.8	71117.4

The **Table 5.2.5 and 5.2.6** above envisaged that the estimated cost C_3 for contract farmers which was Rs.87823.7 per hectare followed by cost C_2, cost C_1, cost B_2 and cost B_1 as 79233.7, 72912.4,75506.4, and 69185 rupees per hectare respectively. Similarly the cost C_3 for non-contract farmers was estimated at 71117.4 followed by cost C_2, cost C_1, cost B_2 and B_1 as 45310.7, 61029.9, 61502.2 and 56879.9 rupees respectively.

Table- 5.2.7 Gross return of sugarcane under different category and size groups

Sl. No.	Farm size	Contract	Non-contract
		Gross Return (Rs.)	Gross Return (Rs.)
1.	Marginal	103360	75840
2.	Small	107900	85300
3.	Large	112520	87910
4.	Pooled	107926	83016

The above **Table No-5.2.7** highlights the performance of sugarcane in terms of gross return obtained by different categories of farmers under different size groups belonging to study area. The overall gross return for contract farming group was estimated 107926 rupees where as for non-contract it was 83016 rupees. There was 24910 rupees difference in gross return between contract and non-contract farming categories.

Measures of farm income

There were various concepts on which farm income can be measured.

Table- 5.2.8 Measures of farm income (contract)

Sl. No.	Particulars of costs	Marginal	Small	Large	Pooled
1.	Gross return	103360	107900	11250	107926.6
2.	Cost A_1	61057.5	63185	64445	62895.8
3.	Cost A_2	61057.5	63185	64445	62895.8
4.	Cost B_2	73264.2	75824	77431	75506.4
5.	Cost C_2	78342.2	79471	79888	79233.7
6.	Cost C_3	88176.4	87418.1	87876.8	87823.7
7.	Farm Business Income	42032.5	44715	48075	44940.8
8.	Family Labour Income	30095.8	32076	35089	32420.2
9.	Owned FBI	4203.5	44715	48075	32331.1
10.	Net income over C_2	25017.8	28429	32632	28692.9
11.	Net income over C_3	15183.6	20481.9	24643.2	20102.9
12.	Return per Rupee invested (over C_2)	1.31	1.35	1.40	1.35
13.	Return per Rupee invested (over C_3)	1.45	1.23	1.28	1.32

Table-No. 5.2.9 Measures of farm income (Non-Contract)

Sl. No.	Particulars of costs	Marginal	Small	Large	Pooled
1.	Gross return	75840	85300	87910	83016.6
2.	Cost A_1	47335	53290	54502.55	51709.2
3.	Cost A_2	47335	53290	54502.5	51709.2
4.	Cost B_2	56527	63274	64705.7	61502.2
5.	Cost C_2	61777	67008	64471.7	45310.7
6.	Cost C_3	67954.7	74478.8	70918.8	71117.4
7.	Farm Business Income	28505	32010	33407.5	27906.4
8.	Family Labour Income	19313	22026	23204.3	31327.5
9	Owned FBI	28565	32010	33407.5	27906.4
10.	Net income over C_2	14063	17592	23438.3	18364.4
11.	Net income over C_3	7885.3	10821.2	16991.2	11799.2
12.	Return per Rupee invested (over C_2)	1.22	1.25	1.36	1.27
13.	Return per Rupee invested (over C_3)	1.11	1.14	1.23	1.16

As envisaged from the **Table No- 5.2.8 and 5.2.9**, the farm business income for contract farms was 44940.8 rupees in comparison with 27906.4 obtained by non-contract farms. Similarly the net income over C_2 and C_3 was estimated at 28692.9 and 20102.9 for contract farms compared to 18364.4 and 11799.2 rupees per hectare for non-contract sugar cane farms. The return per rupee investment over cost C_2 and cost C_3 was 1.35 and 1.32 in contract category compared to 1.27 and 1.16 for non-contract category. Size group wise analysis for both the categories clearly indicated that the cost and profit increases with increase in farm size and vice versa.

From the analysis made above, it has been found that the first hypothesis (H_1) i.e. "Contract farmers invest more and get higher return

in comparison to non-contract farmers" is found to be true and is thus accepted.

SECTION III

5.3 Efficiency of inputs used

Farmers were found to have limited resources and their objective was to maximize farm returns from the available resources. To operate the farm business at the economic optimum level, they had to make some adjustments in the allocation of their resources. The question that arises is whether the farmers belonging to different groups i.e. contract and non-contract respond equally to the economic opportunities and make rational use of resources. How does the resource use efficiency behave for different categories of farms in the two districts for the two commercial crops grown in the state? With this aspect in mind, different types of production functions such as linear, quadratic, semi-log and Cobb-Douglas were tried separately to estimate the relationship between inputs and output for the sample farms of various size groups. The Cobb-Douglas production function, which gave the best fit, was selected to establish the input-output relations with output (yield) of the crop as the dependent variable and human labour, farm power, fertilizer, irrigation, and plant protection measures adopted as the independent variables.

Table-No 5.3.1. Cobb-Douglas production function of the sugarcane farmers in study area (Standard error of the respective regression coefficients are in parenthesis)

Particulars	Contract	Non-contract
Human labour X_1	-0.099 (0.80)	2.067 (14.763)
Machine power X_2	0.001 (0.009)	-0.199 (0.699)
Fertilizer X_3	0.003 (0.009)	2.243 (4.981)
Pest control X_4	0.236 (0.051)	0.619 (0.807)
Irrigation X_5	0.629 (0.140)	-3.989 (0.807)
R^2	0.997	0.995

** Significant at 1% level of probability, * Significant at 5% level of probability

The Cobb-Douglas production function for sugar cane indicated that the input variables like human labour, pest control and irrigation were significant for contract farmers. In case of non-contract farmers,no such significance was observed. The coefficient of multiple regression R^2 varied from 0.995 to 0.997 indicating 95 to 97 variation in the output was explained by the inputs under consideration. The sum of the elasticity for contract farmers indicated increasing returns to scale in comparison to non-contract farmers which indicated decreasing return to scale.

From the analysis, it has been found that the second hypothesis(H_2) i.e. "Resource use efficiency of the crop is higher for contract farmers' in comparison to non contract farmers" is found to be true and is thus accepted.

SECTION- IV.

Constraints in contract farming

Based on the information furnished by farmers, the constraints being faced by contract farmers in practicing contract farming and problems being faced by non-contract farmers in adopting contract farming were ranked and prioritized by the Garrett's ranking method, and have been recorded in Table 5.4.1.and 5.4.2 respectively.

Table -5.4.1 Ranking of various constraints faced by farmers in contract farming based on score

Sl. No.	Constraints	Score	Rank
1.	Lack of credit for crop production	56.8	II
2.	Lower price for crop produce	49.9	VI
3.	Faulty grading by an agency	47.1	VIII
4.	Scarcity of water for irrigation	54.8	III
5.	Difficulty in meeting quality requirements	51.1	V
6.	Lack of quality inputs	45.6	IX
7.	Provision of inputs at higher rate	37.0	XII
8.	Poor service delivery by firms	43.0	X
9.	Delayed payment for crop produce	60.0	I
10.	Frequent power cutting	53.0	IV
11.	Scarcity of labour during peak periods	47.4	VII
12.	Delay in procurement of produce	29.6	XIII
13.	Lack of government control	-	-
14.	Cheating by an agency	-	-

Table -5.4.2 Ranking of various constraints faced by non-farmers in contract farming based on score

Sl. No.	Constraints	Score	Rank
1.	Lack of credit for crop production	53.0	III
2.	Lower price for crop produce	51.0	IV
3.	Faulty grading by an agency	-	-
4.	Scarcity of water for irrigation	57.4	I
5.	Difficulty in meeting quality requirements	-	-

6.	Lack of quality inputs	38.9	IX
7.	Provision of inputs at higher rate	-	-
8.	Poor service delivery by firms	-	-
9.	Delayed payment for crop produce	-	-
10.	Frequent power cutting	54.6	II
11.	Scarcity of labour during peak periods	45.7	VIII
12.	Delay in procurement of produce	-	-
13.	Lack of government control	47.8	VI
14.	Cheating by an agency	47.4	VII

On contract farms, delay in payment of produce the most important constraint (60 Garrett score), followed by lack of credit for crop production (56.8 score), scarcity of water for irrigation (54.8 score), frequent power cutting (53.0 score), difficulty in ting quality requirements (51.0 score) and lower price for crop produce (50.0 score).

On non-contract farms, scarcity of water for ration was the most important constraint (57.4 score), followed by frequent power cutting (54.6 score), lack of credit for crop production (53.0 score), lower price for crop produce (51.0 score) and lack provision for rain-fed crops (49.8 score).

It was also observed that some constraints like city of irrigation water, lack of credit for crop auction, erratic power supply, lower price for produce, lack of labour during peak periods, etc. were being faced by both contract and non-contract farmers. There were some constraints specific to contract farmers while there were some others non-contract farmers too.

Constraints Expressed by Agencies in Expanding Contract Farming

Table -5.4.3 Ranking of various constraints expressed by agencies

Sl. No.	Constraints	Garrett Score	Rank

1.	Lack of proper management by the company	58.0	II
2.	Non-availability of extension staff	38.1	IX
3.	High rate of rent for hiring transport vehicles	46.0	VII
4.	Inability to provide proper transport facilities to farmers due to poor road network, strikes, etc.	50.0	V
5.	Scarcity of transport vehicles during peak periods	52.0	IV
6.	Holding-up of transport vehicles by farmers	32.4	X
7.	Frequent price fluctuations in international markets	56.0	III
8.	Violation of terms and conditions by farmers	61.9	I
9.	Selling of produce to other companies by farmers	42.0	VIII
10.	Farmer's negligence in maintaining quality	48.0	VI

The constraints expressed by agencies in expanding contract farming were prioritized based on Garrett score and have been presented in the **Table 5.4.3**. It was found that violation of terms and conditions by Farmers was the most important constraint, with 61.9 Garrett score, followed by lack of proper management by the company (58.0 score), frequent price fluctuations in international markets (56.0 score), scarcity of transport vehicles during peak periods (52.0 score), inability to provide proper transport facilities to farmers (50.0 score) and farmer's negligence in maintaining quality (48.0 score).

From the observations found from the study, it has been found that the third hypothesis (H_3) i.e. " Contract farming needs government regulation for smooth functioning of contractual arrangements " is found to be true and is thus accepted.

SECTION-V

Policy implications

Contracting companies provide quality inputs such as seeds and plant protection chemicals to the farmers at their farm gate coupled with the

technical advice on production aspects. This not only enabled to reduce the working capital needs of the farmers but also substantially reduced their transaction cost per unit of output. Further, contract farming helped small farmers to improve their income levels. Still some opposition was coming against contract farming, which should be taken care of by this study. Hence, there is an urgent need to promote contract farming in feasible areas.

Going forward, the main problem for the contracting companies is, the farmers selling the produce outside (in the open market). So strict norms should be evolved to follow the agreements mentioned in the contract, in the interest of the contracting companies.

Similarly there are certain situations where market price of the produce falls much below the contract price where contracting companies generally deviate from the agreements and don't purchase the produce from the farmers citing vague reasons based on quality parameters.

Therefore the contract must be made legally tenable, to insulate farmers against exploitation by the contracting companies and there is a need of a regulatory mechanism to look after interest of both the contracting parties.

Nevertheless, according to the survey, farmers prefer contract farming, as it involves no initial investment. Since, the company provides major inputs such as high quality and disease resistant seeds and plant protection chemicals to the farmers along with technical support.

The second most important factor for farmers to go for contract farming was the reasonable price for the produce.

Technical support on package of practice was yet another factor promoting contract farming. In contract farming, the company resource

persons provide the necessary technical know-how relating to the production. This ensures efficient utilization of resources and production of better quality produce.

Access to inputs and transportation facilities form the major consideration to favour contract farming by the farmers. Unlike in proprietor farming, farmers under contract need not worry about the transportation, as the produce was lifted from the farm gate of the farmers. The results are in accordance with the results of Kiresur *et al* (2001).

NABARD's Initiatives in contact farming

Recognizing the potential and benefits of contract farming arrangements in the agriculture sector, NABARD took the important initiative of supporting such arrangements by the banking sector and developed a special refinance package for contract farming arrangements aimed at promoting increased production of commercial crops and creation of marketing avenues for the farmers.

Policy initiatives by NABARD

In order to augment the reach of bank credit and increase the production of commercial crops as also for creation of marketing avenues for the farmers, all contract farming arrangements are made eligible for availing special refinance package from NABARD. The various initiatives undertaken by NABARD in this direction are:

Financial Interventions

1. Special Refinance package for financing farmers for contract farming.
2. 100% refinance to disbursements made by Co-operative Banks, State Co-operative Banks, Regional Rural Banks.

3. Term facility for repayments (3 years).
4. Fixation of higher scale of finance for crops under contract farming.
5. Extension of refinance scheme for financing farmers for contract farming Refinance Facility.

Developmental interventions

1. Conducting workshops and exposure visits for better interface among farmers and entrepreneurs and popularization of contract farming concept.
2. Sensitization of stake holders through State and District level meets and consultations.
3. Sensitization of Bankers through tailor-made training programme at Bankers Institute for Rural Development (BIRD) Lucknow.
4. Follow-up with National Agricultural Insurance Corporation for insurance of crops grown under contractual arrangements.

Policy Issues

Contract farming can be developed as a pro–poor institution through appropriate policies and regulations. Though, the central and state governments have taken a number of policy initiatives in this direction, some issues that are generic in nature merit more attention.

Improve Physical Infrastructure

A firm's decision to invest in agribusiness, to a great extent, is influenced by the availability of public infrastructure (roads, electricity, communication network, electricity, etc.), government policies and regulations. Public infrastructure in India, however, is not well–

developed, leading to a slow growth in private investment in infrastructural developments like refrigerated transport, cold storages and food processing. It is reflected in low level of value-addition to agricultural produce in the organized sector.

Promote Competition

The State Agricultural Produce Marketing Development & Regulation Act in 2003 the Government of India has taken a bold step towards creating a level playing field for the private investment in agricultural markets, agribusiness and contract farming. Its implementation has remained poor. Only a few states have amended their existing Marketing Acts in true spirit, and others have made some cosmetic changes. It is however cautioned that while implementing such policies the governments should take appropriate measures to curb any tendency of regional monopsony and collusive oligopsony.

Evolve Mechanisms for Resolution of Conflicts

By enacting the Model Act, 2003 outlines provisions for regulating contract farming to protect interests of both firms and farmers. However, one of the provisions that merit attention is the mechanisms for dispute resolution. Considering lengthy legal procedures, the Act provides that any dispute between the firm and farmer should be mutually resolved or settled by the market committee with which the contract farming scheme is registered. It is a novel recommendation. However, many contract farming schemes remain unregistered and are not legally vetted, at present. Nevertheless, the need for some judicial or quasi-judicial body for resolution of disputes cannot be ignored as contract farming becomes widespread.

Promote Farmers' Organizations and Other Intermediaries

An effective way to involve smallholders in contract farming is to encourage and facilitate them to organize into cooperatives, self-help groups or growers associations. Such organizational structures also improve their bargaining power vis-à-vis agribusiness firms, and generate scale economies in acquisition of inputs, technology, services and information.

Develop Grades and Standards

Price and quality of output are two important factors that can make or mar contract farming. Agribusiness firms can reject farm produce or pay a lower price on the pretext of its poor quality. This happens due to lack of well-defined grades and standards and transparency thereof in the contract agreement. Organized retailers, exporters and processors often impose their own grades and standards. The need for developing effective grades and standards cannot be ignored with rising demand for safe and quality foods in both domestic and international markets.

Improve Farmers' Capacity to Invest, and Cope-up with Risks

Two important factors in scaling-out/up of contract farming relate to credit and insurance. An overwhelming majority of smallholders lack capacity to invest in high-value agriculture and are risk averse. Some activities like poultry and plantations are capital-intensive and riskier, and need institutional support in terms of finance and insurance. In India although formal rural credit system is fairly well-developed, institutions for agricultural insurance remain under-developed. It is therefore imperative to enhance farmers' access to financial institutions using the string of contract farming or otherwise.

To develop contract farming as a pro-poor market institution, the governments should create a conducive climate for private investment in

agribusiness, promote competition in the market whilst curbing any tendency of regional monopsony and collusive oligopsony, develop and facilitate implementation of grades and standards, improve farmers' access to credit, insurance, technology and extension services, and sensitize and facilitate smallholders to organize into cooperatives, growers' associations and self-help groups.

Issues and concerns

As in any other form of contractual relationship, there are potential disadvantages and risks associated with contract farming. Common contractual problems include farmer sales to a different buyer (side selling or extra-contractual marketing), a company's refusal to buy products at the agreed prices, or the downgrading of produce quality by the buyer. Side selling by farmers to competing buyers is perhaps the greatest problem constraining the growth of contract farming.

Contractors also may default by failing to pay agreed prices or by buying less than the pre-agreed quantities. Invariably more powerful than farmers, may use their bargaining clout to their financial advantage. Indeed, if farmers are not well organized or where there are few alternative buyers for the crop or it is not easy to change the crop, there is a danger that farmers may have an unfair deal. Tactics sometimes used are changing pre-agreed standards, down grading crops on delivery so offering lower prices, or over-pricing for inputs and transport provided. Strengthening farmer organizations to better access appropriate services such as credit, extension services and market information and improving their contract negotiating skills can redress the issue of exploitation of farmers and poorly formulated contracts and their enforcement. Contractual arrangements are gaining popularity by the agriculturists

worldwide overlooking some of the inherent environmental concerns as listed below.

1. **Soil fertility concerns:**

   Mostly the crops cultivated under contract farming arrangements are generally of above-the-average quality, sometimes of export quality too. Due to heavy demand in the processed foods in western and other countries, crops suitable for such processed foods are grown under contract arrangements. The quality standards are set high for these products and to comply with high standards and to maximize output heavy dose of fertilizers, pesticides and insecticides are applied in the field which leads to deterioration in soil quality. High value crops need changes in cropping technologies. This leads to change in the cultural practices in the field. Repeated cultural operations like ploughing, weeding and watering leads to over exploitation of land and soil erosion ultimately occurs. Soil erosion again leads to depletion in soil fertility.

2. **Environmental issues:**

   Due to over use of inorganic fertilizers and pesticides in the fields under contract cultivation of crops the environment gets disturbed which ultimately leads to air-, soil- and water.

3. **Bio-diversity issues**

   Contract farming focuses on a process that lays emphasis on short term maximization of returns from agriculture at the cost of the rich agro biodiversity. Dominance of such perspective does not augur well for the agro-biodiversity in the state. The government seems to have entirely ignored these worrying facts about the

agriculture biodiversity and has moved ahead with its programs to usher in "privatization of agriculture" in the state.

a. In addition to that, monstrous innovation like introduction of Genetically Modified Organisms (GMOs) in the field of agriculture has posed another threat to the farmers, that of contamination of genetic diversity which has got a direct impact not only on Agro- Biodiversity and related issues like food security but also on environment and human health. After having spread their tentacles across the world and in India, Genetically Modified Crops (GMOs), promoted by MNCs (Monsanto Cargill) are now targeting farmers in Odisha.

4. **Food security concerns:**

Most of the crops grown under contract arrangements are cash crops which give more income to farmers but at the same time due to this profit motive food crops are being neglected. Even major food producing areas now are gradually moving towards non food crops under contract cultivation. With ever increasing population, need for food crops in the future will also increase. There is every possibility that contract farming might hamper the food security of the small farmers in future. Such mindless privatization which empowers the private companies to control and manage the agriculture sector is a threat for the already fragile agriculture biodiversity in the state.

5. **Seed problems:**

The seeds of generally modified crops to tackle pests, diseases and to get maximum output are sold by the MNCs. The seeds once used cannot be regenerated as is the case of BT cotton. In such case

the farmers under contract cultivation of such genetically modified crops are dependent on MNCs for seeds and planting materials. Since all inputs are assured by firms involved in the contract farming, the cost of supplying such demanding inputs is deducted by these farms from the amount to be paid to the farmers. So farmers always remain dependent on external.

6. **Labour problems:**

Gender based exploitation of labour persists in many areas.

7. **Contract disputes:**

There are no standard legal procedures in resolving the disputes arising under contract agreements. Most of the reported cases of disputes are from farmer's side. Also once these farmers get the confidence of producing such technically intensive crops and selling the same in open market they tend to break the contract with farms. Also the quality standards set by the farms result in contract disputes either by firm's side or by farmers 'severely food insecure'

8. **Middle man's influence:**

Most of the firms involved in contract arrangement with farmers have fixed middle men to procure the produce from the farmers. These middle men either on their own or joining hands with the firms often under-evaluate the quality of the harvest. Under contract arrangements payments are to be paid based on the quality standards. Based on the findings of the study following recommendations are made:

I. Present provisions of institutional arrangement to record all contractual arrangements should be made effective. The

Panchayat or Gram sabha, particularly in PESA areas or in case of Forest Right Holder communities, may be associated with this process. This will promote and strengthen confidence building between the parties and also help solve any dispute, arising out of violation of contract.

II. The contract farming should have a provision for both forward and backward linkages. Unless both input supply and market for the produce are assured, small farmers will not be in a position to participate in contract farming.

III. There should be bank finance to small and marginal farmers on easy terms. As the payment for contractual produce is made through the bank, the recovery of such loans will be easier.

IV. The contracts should be managed in a more transparent and participatory manner so that there is greater social consensus in handling contract violation from either side without getting involved in costly as well as lengthy process of litigation. Also the contract need to be drawn in a more comprehensive and flexible manner

V. In fact, contract farming may be more beneficial to the farmers if there is farmers' association or cooperative which can replace the role of middlemen or commission agents who are involved in marketing of the contract commodities on behalf of the company. The company representatives may also be a member of the executive committee of such cooperatives.

VI. The most important thing for the sustainability his produce regions, agribusiness of contract farming is the selection of appropriate plant genotype. Unless the plant material is of

good quality and high yielding and less prone to pests and diseases, the contract farmers may lose confidence and discontinue the cultivation of contract crop in question.

VII. The proposed contract crop should have a distinct advantage in terms of relative yield and profit, which will provide higher income to the contract farmers on stable basis.

VIII. In many parts of the country, agricultural tenancy is legally banned, although concealed tenancy exists. Tenants who do not enjoy security of tenure cannot participate in contract farming. Hence, legalization of tenancy would be a precondition for enabling the tenant farmers to benefit from contract farming. Although different forms of land tenant's share-croppers can be adopted to maintain the contract farming, security of tenure would be necessary.

IX. As assured market for the farm produce motivates a farmer to enter into contract with a company, a similar market prospect should exist for the processed products of the company. Ultimately, it is the success of the company's product in national and or international market, which decides whether contract farming for any particular crop or commodity would sustain.

X. The success of contract farming requires that there should be adequate infrastructure facilities of roads, public transport, telephones, postal services, stable power and water supplies, cold storage facilities, etc which should be ensured by the Government. Furthermore, the government has to create a conducive policy environment to promote contract farming by creating an appropriate legal, political and administrative system as well as necessary infrastructure.

XI. The government needs to ensure that contract farming, which is generally commodity specific and tends to promote monoculture, does not grow beyond proportion to destroy biodiversity and agricultural ecology. It may be necessary to provide necessary guidelines for land use planning in each region in order to prevent such eventualities.

XII. The Central Warehousing Corporation and the State Warehousing Corporations should evolve commercially acceptable quality standards in respect of various commodities in order to ensure quality maintenance of the stored goods over a sufficiently longer period of time. The Warehousing Corporations are also required to gear up appropriate market intelligence on the prices of various commodities linked with the grades/ standards.

XIII. The Government of India is already considering Value Added Tax all over the country. The other barriers particularly, the high level of public intervention in the market need to be completely stopped or greatly liberalized in order to allow free flow of trade in agricultural commodity all over the country.

XIV. A massive & effective awareness building campaign should be launched so as to educate the farmers regarding the rules, advantages, disadvantages, arbitration system.

XV. The concerned authority appointed by the government should effectively exercise the right to ask the parties to revise the terms of contract in case the same is found to be risky for the farmer.

XVI. Agreements in vernacular language, particularly in Odia, should be given priority so that the local farmers can

understand the terms of contract. To suite the other party, it can be made bilingual. Standard formats for farmer-friendly agreement should be designed and mandated by the government.

XVII. Liability of the contractor to environmental losses should be fixed by the government, and in case such losses occur, the penalty realized in a proportionately appropriate amount should be spent for restoring the concerned area, preferably through the local Palli sabha/ Gram sabha.

XVIII. Additional safeguarding rules for tribal areas should be made because contract farming is an easy way to exercise virtual ownership over tribal land by the non-tribal. Recent instances of Maoist- and like-minded organizations' attack in Narayanpatana area of Koraput district should be an eye opener for the government.

XIX. For lands recognized under Forest Rights Act, contract farming if practically meaning virtual control of a person or agency other than the right-holder himself/herself would be essentially against the spirit & mandate of the Act; so government should take precautionary measures in this context.

XX. Updated database of contract farmers along with other relevant details such as the area & crops under contract, contracting agency, etc. should be maintained at a state level and should be made public through a website contract farming companies including firms.

CHAPTER-VI

SUMMARY AND CONCLUSION

SUMMARY AND CONCLUSION

Contract farming is an effective way to coordinate and promote production and marketing in agriculture. Realizing the importance of the practice an attempt was made to study the contract arrangements of sugarcane crop in Dhenkanal district of Odisha with the following objectives and hypotheses.

Objectives

1. To examine the cost, return and input use efficiency of sugarcane in contract vis-a-vis non contract sugarcane farmers.
2. To find out the constraints of contract farming.
3. To suggest policy measures for better working of the contract arrangements in the prevailing system.

Hypotheses

H_1- Contract farmers invest more and get higher return in comparison to non-contract farmers.

H_2- Resource use efficiency of the crop is higher for contract farmers' in comparison to non contract farmers.

H_3- Contract farming needs government regulation for smooth functioning of contractual arrangements.

Methodology

Dhenkanal district was selected to study contract farming arrangements between Shakti Sugar and for sugarcane farmers. Similarly Sadar block of the district was purposively selected for the study. Two villages viz. Korian and Sankarpur from the block were selected at random for the purpose. The farmers were then stratified as contract and non contract farmers. Then both i.e. contract and noncontract farmers were further stratified into three size groups i.e. Marginal Farmer (below 1 ha), Small Farmer (1-2 ha) and Large Farmer (more than 2 ha). A total number of 24 farmers from contract and another 24 from non contract farmers were thus selected from each district representing sugarcane crop. A total number of 48 farmers were selected from the state for final analysis.

Major findings of the study

The study has revealed that the operational cost i.e. cost A_1 was higher in case of contract farmers for all categories of farmers. Among the contract farmers the highest cost A_1 was realized by large farmers with Rs. 64445 followed by small and marginal with Rs. 63185 and Rs. 61057.5, respectively. Over all the cost A_1, for contract farmers was Rs. 50006.8. Percentage wise cost A_1 indicate that Human Labour accounted overall 54.50 per cent of total variable cost followed by seed, fertilizer, irrigation and manure respectively.

Among the non contract farmers the highest cost A_1, was estimated for large farmers with Rs. 54502.5 followed by small and marginal

amounting Rs. 53290 and Rs. 47335 respectively, over all the cost of production was Rs. 51709.7. Like the contract farmers, in case of non-contract farms, 59.32 percent of the total cost A_1 was incurred for human labor followed by seed, fertilizer, manure, hired animal labor respectively.

Overall the operational cost incurred by the contract farmers was found to be Rs. 11186.6 higher than that of non contract farmers because of the use of improved technology, recommended doses of fertilizer by the contract farmers than the non contract farmers. However, the percentage of cost by non-contract farmers was more for hired animal labor and the use of machine power for the cultivation of sugarcane was less for non contract farmers.

The estimated cost C_3 for contract farmers which was Rs.87823.7 per hectare followed by cost C_2, cost C_1, cost B_2 and cost B_1 as Rs. 79233.7, Rs. 72912.4, Rs. 75506.4, and Rs. 69185 per hectare respectively. Similarly the cost C_3 for non-contract farmers was estimated at Rs. 71117.4 followed by cost C_2, cost C_1, cost B_2 and B_1 as Rs. 45310.7, Rs. 61029.9, Rs. 61502.2 and Rs. 56879.9 respectively.

The overall gross return for contract farming group was estimated at Rs. 107926 where as for non-contract it was Rs. 83016. There was Rs. 24910 difference in gross return between contract and non-contract farming categories.

The farm business income for contract farms was Rs. 44940.8 in comparison with Rs. 27906.4 obtained by non-contract farms. Similarly the net income over C_2 and C_3 was estimated at Rs. 28692.9 and Rs. 20102.9 for contract farms compared to Rs. 18364.4 and Rs. 11799.2 per hectare for non-contract sugar cane farms. The return per rupee investment over cost C_2 and cost C_3 was 1.35 and 1.32 in contract category compared to 1.27 and 1.16 for non-contract category. Size group

wise analysis for both the categories clearly the cost and profit increases with increase in farm size and vice versa.

From the analysis, it has been found that the first hypothesis (H_1) i.e. "Contract farmers invest more and get higher return in comparison to non-contract farmers" is found to be true and is thus accepted.

The Cobb-Douglas production function for sugarcane indicated that the input variables like human labour, pest control and irrigation were significant for contract farmers. In case of non-contract farmers no such significance was observed. .The coefficient of multiple regression R^2 varied from 0.995 to 0.997 indicating 95 to 97 variation in the output was explained by the inputs under consideration.

From the analysis, it has been found that the second hypothesis (H_2) i.e. "Resource use efficiency of the crop is higher for contract farmers' in comparison to non contract farmers" is found to be true and is thus accepted.

On contract farms, delay in payment of produce the most important constraint (60 Garrett score), followed by lack of credit for crop production (56.8scor e), scarcity of water for irrigation (54.8 score), frequent power cutting (53.0 score), difficulty in ting quality requirements (51.0 score) and lower price for crop produce (50.0 score).

On non-contract farms, scarcity of water for ration was the most important constraint (57.4 score), followed by frequent power cutting (54.6 score), lack of credit for crop production (53.0 score), lower price for crop produce (51.0 score) and lack provision for rain-fed crops (49.8 score).

It was also observed that some constraints like city of irrigation water, lack of credit for crop production, erratic power supply, lower price for produce, lack of labour during peak periods, etc. were being faced by both contract and non-contract farmers.

From the observations found from the study, it has been found that the third hypothesis (H_3) i.e. " Contract farming needs government regulation for smooth functioning of contractual arrangements " is found to be true and is thus accepted.

Contract farming can be developed as a pro–poor institution through appropriate policies and regulations. Though, the central and state governments have taken a number of policy initiatives in this direction, some issues that are generic in nature merit more attention. These are Improve Physical Infrastructure, Promote Competition, Evolve Mechanisms for Resolution of Conflicts, Promote Farmers, Organizations and Other Intermediaries, Develop Grades and Standards, Improve Farmers' Capacity to Invest, and Cope-up with Risks.

Suggestions:

1. The contract must be made legally tenable, to insulate farmers against exploitation by the contracting companies and there is a need of a regulatory mechanism to look after interest of both the contracting parties
2. Compact area approach can be viewed as a means of rural adjustment and of adapting to a risky world. The effectiveness of compact area approach as a means of permitting farmers to achieve economies by working together and to share risk.
3. There is a need to create conditions that would enable farmers to produce freely in cooperation with each other rather than under the direction of capital and the state. The solution of these problems must be found within the suitable legal framework of the contract so as to ensure smooth relationships between the firm and farmer.
4. New institutional mechanisms must be investigated which would facilitate small farmers' access to credit, technical assistance, and

inputs and reduce the uncertainty in marketing their output. Once such mechanisms are developed and policy bias reduced, small farmers will be able to raise their incomes by producing high value crops.

5. Greater coordination in farm planning is most urgent and requires a rethink of the roles of agribusiness firm and farmers' organization as well as acceptance by farmers that long term planning for crop rotation and soil management has associated self-benefit.
6. It is also important to realize that contracting need not be promoted for all crops, farmers and regions. The state government should play more a regulatory role rather than a promotional role. Farmers' organizations should be promoted by government and non-government development agencies to deal effectively with contracting companies.
7. Agriculture Produce Marketing Act will be amended to enable farmers to sell directly to contractors/ processors.
8. A suitable legal framework needs to be put in place to ensure smooth operation of otherwise potentially sound concept of contract farming.
9. It must be proposed to development of product specific regions linked to export channels.
10. Prices of the produce must be reviewed and renewed every year.
11. Shift from a piece meal approach to an integrated chain and look at all aspects for a particular produce should be ensured.
12. Similarly a shift of focus from production to market, based on principle of comparative advantage should also be emphasized.

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APPENDICES

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CONTRACT FARMING OF SUGARCANE IN DHENKANAL DISTRICT

1. Background information (Common for one village): State _____

District_____ Block _____ Village _____

Type of Village: Population: _____ No. of households: _____

No. of farming households: _____

Whether a contract farmer----------, Name of Contracting agency ----------

2. Personal information about family:

Name of (farming) head of the household _____

Age (years) _____ Educational level (primary/secondary/higher) _____

Family size: Male adult _____ Female adult _____ Children _____

No. of family member engaged in agriculture: Male _____Female _____

Qualification OF Head of family_____

Persons involved in off-farm activities (Dairying, Business, Service, Labour wage) _____

Major source of family income: Farming/ Dairying/ Business/ Service/Labour wage

3. Cultivation Practices:

3.1 Total cultivated area (owned and leased 2012-13) (hectares):

Type of holding	Irrigated (indicate source of irrigation*)	Un-irrigated	Total
Own			
Leased-in			
Leased-out			
Total operational			

** C = Canal, T = Tube-well, W = Well, O = Others (tank, pond, etc.)*

3.2 Farm assets:

3.2.1. Number of animals:

	Cow	Buffalo	Bullock	Calves	Goats	Others
Numbers						
Age						

3.2.2. Farm tools/machineries:

A.	Tractor	Power-tiller	Seed-driller	Cultivator/ M.B. plough	Transplante/ Harvester	Thresher
Numbers						
Capacity						
*Year of purchase						

B.	Diesel-engine	Electric motor	Tube-wells	Sprayer	Deshi-plough	Other
Numbers						
Capacity						
*Year of purchase						

**If the machine has been purchased second-hand, give actual age of the machine.*

4. Information about Contractual arrangement

	Amount In Kg	Value In Rs	Amount In Kg	Value In Rs	Amount In Kg	Value In Rs
Supply of Input Production Technology						
Supply of Inputs, Production Technology & Marketng						
Only Marketing						
Others if any						

If any problem in contract arrangements mention it along with remedial measures taken:

5. Crops grown by the farmers (Cropping pattern):

	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6
5.1.Plot area in acres						
5.2.Ownership*						
i) Kharif						
ii) Rabi						
iii) Summer						
5.3 Reasons for given cropping pattern						

6. Area under S.Cane:-

6.1 Sugarcane production practices (2012-13): (Qty in Kg/ acre)

Items	
Quantity of seed/seed material used (qtl/acre)	
Seed variety	
Price of seed (Rs/kg)	
Seed treated (.....)	
Method of sowing *(1= Manual transplanting, 2= Trench method, 3= Behind the plough,4=Pit methdr)*	
Qty of organic manure (OM) applied (q/acre)	
Price of organic manure, purchased (Rs./ q)	
Frequency of OM application *(1 = every yr, 2 = alternate yr)*	
Qty of Urea applied (kg/acre)	
Price of Urea (Rs/ kg)	
Qty of DAP/phosphatic fertilizer applied	

(kg/acre)	
Price of DAP (Rs/ kg)	
Qty of Potash applied (kg/acre)	
Price of Potash (Rs/ kg)	
Qty of Zinc applied (kg/acre)	
Price of Zinc (Rs/ kg)	
Qty of other micro nutrients (mention) (kg/acre)	
Price of micro-nutrients (Rs/kg)	
Number of irrigations	
Duration of irrigation (Hrs/ acre)	
Interval of irrigation (Days after sowing for 1st, 2nd, 3rd)	
Irrigation charges (Rs./hour)/ Expenses, if own (Rs./acre)	

6.2 Plant protection measures of Sugar Cane:

Items	
Major weeds in field	
*Control measures	
Name of herbicides used	
Qty of herbicides/ acre	
Expenses on herbicides	
Major insects	
*Control measures	
Name of pesticides used	
Qty of pesticides/ acre	
Expenses on pesticides	
Major diseases	
*Control measures	
Name of chemicals used	
Qty of chemicals/ acre	
Expenses on chemicals	

6.3 Crops' production use pattern (quintal):

Item	
Total cane production	
home consumption	
Retained for seed	
*Sold/ Stored for selling	
Selling price (Rs/Q)	
Retained for other	

6.4 Expenses on hiring human labour for different crops' production activities during 2012-13 (Rs./acre)

Items/Amount/Value	
1. Land preparation	
2. Sowing / transplanting	
3. Irrigation	
4. Manuring	
5. Fertilizer application	
6. Pesticide spray	
7. Weeding	
8.Itner culture &staking	
8. Watch and ward	
9. Harvesting	
10. Marketing	

6.5 Expenses on hiring animal and machine labour for crops' productions: (Rs./acre)

Items /Amount/Value	
Animal labour hired	
Land preparation	
Manuring	
Threshing	
Other (specify)	
Machine labour hired	

Land preparation	
Sowing (seed-drill)/ transplanting	
Agro-chemical spray	
Harvesting	
Threshing	
Other, specify	

6.6 Other related information prevailing in the village:

Human labour wage: Rs____/ day ; Animal labour wage: Rs.____/day/ pair of bullocks

Diesel consumed in irrigation: ____litres/hr ; Electricity charges: Rs._____/unit

Tractor time for ploughing:____hrs/acre ; Time taken for threshing: _____hrs/acre

Diesel consumed by tractor: ____litres/hr ; Land revenue: Rs_____/acre

6.7 Technology Adoption:

Sl. No.	Name of practices	Recommended technology	Adopted technology
1.	Land preparation		
2.	Planting method		
3.	Variety		
4.	Organic manure		
5.	Fertilizer use		
6.	Plant protection		
7.	Cultural practices		
8.	Irrigation		
9.	Harvesting		
10.	Marketing		

6.8 Marketing of Produce:

To whom did you sell your produce?

Sl. No.	Period of sale	Quantity	Price	Buyer
1.				

2.

3.

4.

5.

6.9 If the farmer do not sale sugar cane Whether he is making Gur.- Yes/No

i) How much is crushing expenditure--------
ii) No of Workers required per acre of cane crushing
iii) Amount of Fuel required----------Value
iv) Crusher hiring charges-------
v) Reasons for preferring own crushing---------

CONSTRAINTS IN SUGARCANE PRODUCTION

7. Technological Constraints (Reasons if applicable):

7.1. Reasons for late sowing

(i) land not free on time (ii) insufficient moisture in soil
(iii) lack of assured irrigation (iv) Any other reason, specify

7.2. Do you treat the seed before sowing - Yes / No

7.3. If No, what are the important reasons?

(i) Lack of knowledge (ii) Material not available when needed
(iii) Ignorance (iv) High cost

7.4. Reasons for not applying recommended dose of fertilizer

(i) Not known (ii) Costly fertilizer
(iii) Recommendation not suitable (iv) Unavailability of fertilizer

7.5. Reasons for not applying recommended no. of irrigations -

(i) Not profitable (ii) High charges
(iii) Sources not available on time (iv) Any other specify

7.6. Reasons for not doing intercultural operations -

(i) Costly labour (ii) Farm implements not known
(iii) Costly herbicide (iv)Herbicide not available
(v) Herbicide not effective

7.7. Reasons for not using Plant Protection measures

i) Pests & diseases not problematic (above threshold)
ii) Agro-chemicals - not effective
III) Agro-chemicals -costly
iv) Agro-chemicals-not available on time
v) Agro-chemicals –not known

7.8 Socio-economic Constraints

(a) Do you think that price is not remunerative -
Yes / No

(b) Are you getting enough margin of profit for continuing sugar cane cultivation? - Yes / No

(c) How much profit (per acre) do you expect for cultivation - Rs.

(d) Whether labours are really available when required - Yes / NO

7.9. Infrastructural Constraints

i) Village connected with - Metallic road / *Kachcha* road ----------

ii) What is the mode of transportation for agricultural produce?
(a) Tractor (b) Bullock cart (c) Any other

iii) Electricity availability - Sufficient / Insufficient Timely / Untimely

iv) Are you satisfied with source of irrigation - Yes / No

v) If no, what kind of irrigation facility do you expect? ----------

8. Marketing Constraints:

8.1. Major sources of farm inputs (fertiliser / pesticides)
(i) PACS (ii) Local traders (iii) Regulated market (iv) Company outlets

8.2. Do you think farm inputs are: timely available - Yes / No
adequately available: Yes / No

8.3. Where do you sell your produce
(i) PACS
(ii) Local traders
(iii) Regulated market
(iv) Govt. agency (V) Feed factory (vi) Any other specify

8.4. Are you satisfied with marketing facility - Yes / No
If no, what do you expect
(i) Regulated market (ii) New Govt. Agency (iii) PACS should purchase

8.5. Do you grade your produce before selling – Yes / No.
If yes, how much extra price did you realise - Rs. ----------
i) price difference not much ii) Labour not available
iii) grading equipment not available iv) any other

8.6. Storage facility available in locality - Yes / No

8.7. Options available for higher price
i) Distant market
ii) Direct to factory
iii) Selling during lean season
iv) Any other, specify

9. Government Policy:

9.1. Market price is lower than MSP - Yes / *No*

9.2. If yes, why you are not selling to govt. agency at MSP

i) Agency not available ii) High marketing cost

iii) Delayed payment iv) Any other, specify

9.3. MSP is remunerative - Yes / No

9.4. if no, how much do you wish ---------

9.5. What do you expect from Govt.? (rank)

i) Fertiliser subsidy -------- ii) Electricity subsidy ------

iii)Procurement of crop ----- iv) Development of storage facility---

v) Processing facility ------ vi) Better trade and price policy ---

vii) Any other --------

10. Conflict of Contract Farming:

10.1 To whom you sell you produce.

10.2 Have you made any written contract with the organization?

10.3 Whether you are satisfied with the business organization. Yes/No

10.4 Whether the produce is lifted after the harvest immediately.

10.5 Whether the inputs are available in time as per market rate.

10.6 Whether the value of product is paid in time.

10.7 If you have any complain regarding the contract with whom you lodge the complain.

10.8 Are you member of any farmer's organization?

10.9 How do you suggest the problem can be sorted out?

10.10 Have you heard about directorate of marketing?