Economics of Contract Farming: A Case Study of Contract Farming of Iceberg Lettuce in Kullu District of Himachal Pradesh

अनुबंध खेती का अर्थशास्त्र: हिमाचल प्रदेश के कुल्लू जिले में हिमशैल सलाद की अनुबंध खेती का एक अध्ययन

Rahul Malik

Project Report

Master of Business Administration

(Agri Business)

2022

Institute of Agri Business Management
Swami Keshwanand Rajasthan Agricultural University
Bikaner – 334006

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Rahul Malik

Project Report

Submitted to the
Swami Keshwanand Rajasthan Agricultural University, Bikaner
in partial fulfilment of the requirement for the degree of

Masters of Business Administration
(Agri Business)
By

Rahul Malik

2022

Institute of Agri Business Management

Swami Keshwanand Rajasthan Agricultural University, Bikaner

Certificate – I

Date…..……

This is to certify that **Mr. Rahul Malik** had successfully completed the Comprehensive Examination held on **11-06-2020** as required under the regulation for the degree of Master of Business Administration (Agri Business).

DIRECTOR

Institute of Agri Business Management

Swami Keshwanand Rajasthan Agricultural University, Bikaner

Date…..……

Certificate –II

This is to certify that this Project Report entitled **"Economics of Contract Farming: A Case Study of Contract Farming of Iceberg Lettuce in Kullu District of Himachal Pradesh"** submitted for the degree of Master of Business Administration (Agri Business) embodies bonafide project work carried out by **Mr. Rahul Malik** under my guidance and supervision and that no part of this Project Report has been submitted for any other degree. The assistance and help received during the course of investigation have been fully acknowledged. The evaluation committee also approved the draft of this Project Report on.....

(Vikram Yogi)
Major Advisor

DIRECTOR IABM

Institute of Agri Business Management

Swami Keshwanand Rajasthan Agricultural University, Bikaner

Date: ……..

Certificate – III

This is to certify that the project report entitled **"Economics of Contract Farming: A Case Study of Contract Farming of Iceberg Lettuce in Kullu District of Himachal Pradesh",** submitted by **Mr. Rahul Malik** to the Swami Keshwanand Rajasthan Agricultural University, Bikaner in partial fulfilment of requirement for the degree of Master of Business Administration (Agri Business) after recommendation by the external examiner was defend by the candidate before the following members of the evaluation committee. The performance of the candidate in the oral examination on his project report has been found satisfactory. We recommend that the project report be approved.

Advisory Committee;

(Vikram Yogi)
Major Advisor

(Amita Sharma)	(Rajesh Kumar Verma)	(Neena Sareen)
Member	Member	Dean PGS Nominee

Recommended for approval

Director, IABM

APPROVED

Dean,
Post Graduate Studies

Institute of Agri Business Management

Swami Keshwanand Rajasthan Agricultural University, Bikaner

Date: …….

Certificate – IV

This is to certify that **Mr. Rahul Malik** of the Institute of Agri Business management, Bikaner has made all the corrections/modifications in her Project report entitled **"Economics of Contract Farming: A Case Study of Contract Farming of Iceberg Lettuce in Kullu District of Himachal Pradesh"** which were suggested by the external examiner and approved by the committee constituted for the purpose in the oral examination held on……The final copies of the project report duly bound and corrected were submitted on ……and enclosed here with for approval.

Advisory Committee.

(Vikram Yogi)
Major Advisor

(Amita Sharma)	(Rajesh Kumar Verma)	(Neena Sareen)
Member	Member	Dean PGS Nominee

Recommended for approval

Director, IABM

APPROVED

Dean,
Post Graduate Studies

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Certificate – V

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(Rahul Malik)

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1 1. Introduction 1.1 Introduction to Contract Farming Indian agriculture has undergone a phenomenal transformation during the last

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past five decades. The metamorphosis was brought by not only technological changes such as green revolution, but also by institutional innovations in delivering farm inputs and marketing of output. Contract farming is one such institutional initiative undertaken in recent years to address some of the problems faced by the Indian farmers.

Contract farming facilitators farmers in getting inputs and technical advice on time and firms involved in contracts earn profit from, agriculture production either by lifting the production and supplying to the agro- processing companies or by exporting the product after processing by its own. In the first case the firms act as a facilitator alone but in the latter, they enjoy the profits of exports. Various authors have tried to explain contract farming they give their own definitions on various aspects and various situations. According to Sukhpal Singh "

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As a system for the production and supply of agricultural

and horticultural produce by farmers/primary producers under advance contract, the essence of such arrangements being a commitment to provide and agricultural commodity of a type, at a specified time, price, and in specified quantity to a known buyer.

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Contract farming can be defined as an agreement between a farmer and processing and/or marketing firm for the production and supply of agricultural products

under forward agreements, frequently at predetermined prices (
Charles and Shepherd, 2001). The arrangement also invariably
involves the purchaser in

The following certificate will be submitted by the concerned HOD to the Dean, PGS.

S. K. RAJASTHAN AGRICULTURAL UNIVERSITY, BIKANER

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Acknowledgement

The present investigation is a synthesized effort of various sources. Firstly, I am deeply grateful to my parents. Coming from the intense gratification of my supervisors whose contribution has raised the quality of this study. They have always supported me and have given me enthusiasm throughout my project work. They have patiently guided me. I am very grateful to their supervision and I owe them the greatest degree of appreciation.

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I feel short of words to express my heartfelt gratitude from the bottom of my heart to my beloved parents for their consistent support without which it was impossible to complete this journey.

Last but not the least, I would like to thank all my friends, juniors and seniors for their cooperation and immense help during the entire project work.

Date:

Place: Bikaner *(Rahul Malik)*

Executive Summary

Indian agriculture has undergone a phenomenal transformation during the last past five decades. The metamorphosis was brought by not only technological changes such as green revolution, but also by institutional innovations in delivering farm inputs and marketing of output. Contract farming is one such institutional initiative undertaken in recent years to address some of the problems faced by the Indian farmers.

Agriculture is the most important sector of Indian economy. Indian agriculture sector accounts for 15.87 per cent of India's gross domestic product (GDP) and provides employment to the 54 per cent of country's population. The scenario of agriculture in India is changing. Farmers are keen in transforming from traditional approach of farming to market-led approach. Farmers are now looking for the means and ways to shift from subsistence agriculture to market-oriented production. In this context, contract farming provides a unique opportunity to diversify their production. With minimum risk, it motivates the farmers to take up a new venture. There is an unprecedented interest shown by all the stake holders of contract farming.

Contract farming is an institutional pact/arrangement where the farmer agrees to produce the contractor company's crop on his own land. The price of produce and amount to be purchased are already pre-determined. Contract farming holds the potential to help upgrade small and marginal farmers and integrate them into agricultural value chains.

The study area was the Kullu district of Himachal Pradesh is well known for its cool weather and snow-capped mountains. It was a well-known place in Himachal Pradesh where the exotic as well as the local vegetable production, is going on extensively. A cluster of contract farming villages (Seobagh, Karzan, Nagger) was picked based on discussions with the company's supervisors and directors. The farmers who were contributing significantly to the production of iceberg lettuce in the region were selected.

Findings of this study have explained many things related to iceberg lettuce like Adoption of contract farming was prominent in the middle age group i.e. (26 – 45 years). The non- contract farming was more prominent in the higher age group i.e. (more than 46 years) of farmers. Contract farming is preferred by the farmers who have large land holdings i.e. (more than five hectares of land). The farmers having less than five hectares of land choose non- contract farming in the study area. Farmers mostly participate in the contract farming as they are majorly influenced by the company offered price which stands in the first position followed by the credit/financial support and having lack of inputs. The total cost of production in case of contract farmers was Rs. 81,500/acre while for non-contract farmers was Rs.77,000/acre. In case of contract farmers out of total cost of production, human labor was the most expensive input which constituted 31.91 per cent against 23.38 per cent in the case of non -contract farmers.

In case of non- contract farmers out of total cost of production, seed costs were significantly higher than those of others which contributes 38.96 per cent. Farmers under contract received net returns of Rs. 12.47 per kg of iceberg lettuce while non-contract farmers received Rs. 10.55 per kg of iceberg lettuce. Gross returns for contract farmers were Rs. 216713.49/acre while for non-contract farmers were Rs. 172788.42/acre. The sample contract farmers received an annual income of Rs. 319583.33/acre While non-contract farmers, they received Rs. 250683.33/acre for every annum. The net change turns out to be Rs. 68,900/acre and with positive a 27.48 per cent change between contract farms and non-contract farms. The major constraints faced by the farmers were difficulty in meeting quality requirements followed by delay in payments and provision of inputs at higher costs. The company's major constraints were farmers' contract voidability and inability to meet predetermined quality parameters.

कार्यकारी सारांश

पिछले पांच दशकों के दौरान भारतीय कृषि में अभूतपूर्व परिवर्तन हुआ है। कायापलट न केवल हरित क्रांति जैसे तकनीकी परिवर्तनों द्वारा लाया गया था, बल्कि कृषि आदानों और उत्पादन के विपणन में संस्थागत नवाचारों द्वारा भी लाया गया था। अनुबंध खेती एक ऐसी संस्थागत पहल है जो हाल के वर्षों में भारतीय किसानों द्वारा सामना की जाने वाली कुछ समस्याओं को हल करने के लिए की गई है।

कृषि भारतीय अर्थव्यवस्था का सबसे महत्वपूर्ण क्षेत्र है। भारतीय कृषि क्षेत्र भारत के सकल घरेलू उत्पाद (जीडीपी) का 15.87 प्रतिशत है और देश की 54 प्रतिशत आबादी को रोजगार प्रदान करता है। भारत में कृषि का परिदृश्य बदल रहा है। किसान खेती के पारंपरिक दृष्टिकोण से बाजार के नेतृत्व वाले दृष्टिकोण में बदलने के इच्छुक हैं। किसान अब निर्वाह कृषि से बाजार उन्मुख उत्पादन में स्थानांतरित करने के साधनों और तरीकों की तलाश कर रहे हैं। इस संदर्भ में, अनुबंध खेती उनके उत्पादन में विविधता लाने का एक अनूठा अवसर प्रदान करती है। न्यूनतम जोखिम के साथ, यह किसानों को एक नया उद्यम शुरू करने के लिए प्रेरित करता है। अनुबंध खेती के सभी हितधारकों द्वारा अभूतपूर्व रुचि दिखाई गई है। अनुबंध खेती एक संस्थागत समझौता/व्यवस्था है जहां किसान अपनी भूमि पर ठेकेदार कंपनी की फसल का उत्पादन करने के लिए सहमत होता है। उपज की कीमत और खरीदी जाने वाली राशि पहले से ही पूर्व निर्धारित है। अनुबंध खेती में छोटे और सीमांत किसानों के उन्नयन और उन्हें कृषि मूल्य श्रृंखलाओं में एकीकृत करने में मदद करने की क्षमता है।

अध्ययन क्षेत्र हिमाचल प्रदेश का कुल्लू जिला अपने ठंडे मौसम और बर्फ से ढके पहाड़ों के लिए अच्छी तरह से जाना जाता है । यह हिमाचल प्रदेश में एक प्रसिद्ध स्थान था जहां विदेशी के साथ-साथ स्थानीय सब्जी उत्पादन बड़े पैमाने पर चल रहा है। कंपनी के पर्यवेक्षकों और निदेशकों के साथ चर्चा के आधार पर अनुबंध खेती गांवों (सेबबाग, कर्ज़न, नग्गर) का एक समूह चुना गया था। जो किसान इस क्षेत्र में हिमशैल सलाद पत्ता के उत्पादन में महत्वपूर्ण योगदान दे रहे थे, उन्हें चुना गया था।

इस अध्ययन के निष्कर्षों ने हिमशैल सलाद पत्ता से संबंधित कई चीजों को समझाया है जैसे कि अनुबंध खेती को अपनाना मध्यम आयु वर्ग में प्रमुख था यानी (26 - 45 वर्ष)। गैर- अनुबंध खेती, किसानों के उच्च आयु वर्ग अर्थात (46 वर्ष से अधिक) में अधिक प्रमुख थी। अनुबंध खेती को उन किसानों द्वारा पसंद किया जाता था जिनके पास बड़ी भूमि जोत यानी (पांच हेक्टेयर से अधिक भूमि) थी। पांच हैक्टेयर से कम भूमि वाले किसान अध्ययन क्षेत्र में गैर-संविदा खेती का चयन करते थे। किसान ज्यादातर अनुबंध खेती में भाग लेते थे क्योंकि वे मुख्य रूप से कंपनी द्वारा प्रस्तावित मूल्य से प्रभावित होते थे, जिसके बाद क्रेडिट / वित्तीय सहायता होती थी और इनपुट की कमी होती थी। अनुबंध किसानों के मामले में उत्पादन की कुल लागत 81,500 रुपये प्रति एकड़ थी जबकि गैर-अनुबंध किसानों के लिए 77,000 रुपये प्रति एकड़ थी। उत्पादन की कुल लागत में से अनुबंध किसानों के मामले में, मानव श्रम सबसे महंगा इनपुट था जो गैर- अनुबंध किसानों के मामले में 23.38 प्रतिशत की तुलना में 31.91 प्रतिशत का गठन करता था।

उत्पादन की कुल लागत में से गैर- अनुबंध किसानों के मामले में, बीज लागत अन्य की तुलना में काफी अधिक थी जो 38.96 प्रतिशत का योगदान देती है। अनुबंध के तहत किसानों को हिमशैल सलाद के प्रति किलोग्राम 12.47 रुपये का शुद्ध रिटर्न मिला, जबकि गैर-अनुबंधित किसानों को 10.55 रुपये प्रति किलोग्राम हिमशैल सलाद प्राप्त हुआ। अनुबंध किसानों के लिए सकल रिटर्न 216713.49 रुपये प्रति एकड़ था, जबकि गैर-अनुबंधित किसानों के लिए 172788.42 रुपये प्रति एकड़ था। नमूना अनुबंध किसानों को 319583.33 रुपये प्रति एकड़ की वार्षिक आय प्राप्त हुई, जबकि गैर-अनुबंधित किसानों को हर साल के लिए 250683.33 रुपये / एकड़ प्राप्त हुए। शुद्ध परिवर्तन 68,900 रुपये प्रति एकड़ और अनुबंध खेतों और गैर-अनुबंध खेतों के बीच 27.48 प्रतिशत के सकारात्मक परिवर्तन के साथ निकला। किसानों द्वारा सामना की जाने वाली प्रमुख बाधाएं गुणवत्ता संबंधी आवश्यकताओं को पूरा करने में कठिनाई थीं, जिसके बाद भुगतान में देरी और उच्च लागत पर आदानों का प्रावधान था। कंपनी की प्रमुख बाधाएं किसानों की अनुबंध शून्यता और पूर्व निर्धारित गुणवत्ता मापदंडों को पूरा करने में असमर्थता थीं।

1. Introduction

1.1 Introduction to Contract Farming

Indian agriculture has undergone a phenomenal transformation during the last past five decades. The metamorphosis was brought by not only technological changes such as green revolution, but also by institutional innovations in delivering farm inputs and marketing of output. Contract farming is one such institutional initiative undertaken in recent years to address some of the problems faced by the Indian farmers.

Contract farming facilitators farmers in getting inputs and technical advice on time and firms involved in contracts earn profit from, agriculture production either by lifting the production and supplying to the agro-processing companies or by exporting the product after processing by its own. In the first case the firms act as a facilitator alone but in the latter, they enjoy the profits of exports.

Various authors have tried to explain contract farming they give their own definitions on various aspects and various situations. According to Sukhpal Singh “As a system for the production and supply of agricultural and horticultural produce by farmers/primary producers under advance contract, the essence of such arrangements being a commitment to provide and agricultural commodity of a type, at a specified time, price, and in specified quantity to a known buyer.

Contract farming can be defined as an agreement between a farmer and processing and/or marketing firm for the production and supply of agricultural products under forward agreements, frequently at predetermined prices (Charles and Shepherd, 2001). The arrangement also invariably involves the purchaser in providing a degree of production support through, for example, supply of inputs and provision of technical advice. The basis of such arrangements is a commitment by the farmer to provide a specific commodity in quantities and on quality standards

determined by the purchaser and a commitment by the company to support the farmer's production and to purchase the commodity. Contract farming is an intermediate production and marketing system that spreads production and marketing risks between agribusiness and smallholders. Similarly, it also provides agribusiness companies with the opportunity to guarantee a reliable source of supplies of required quantity and quality. It can be regarded as a means of reducing high transaction costs that result from the failure of the market and/or government to provide required inputs and market institutions.

The intensity of the contractual arrangement varies according to the depth and complexity of the provisions in each of the following three areas (Charles and Shepherd (2001):

a) Market provision: The grower and buyer agree to terms and conditions for future sale and purchase of a crop or livestock products.
b) Resource provision: In conjunction with marketing arrangements the buyer agrees to supply selected inputs, including on occasions land preparation and technical advice.
c) Management specifications: The grower agrees to follow recommended production methods, inputs regimes, and cultivation and harvesting specifications.

Agriculture is the most important sector of Indian economy. Indian agriculture sector accounts for 15.87 per cent of India's gross domestic product (GDP) and provides employment to the countries workforce 54 per cent of population. The scenario of agriculture in India is changing. Farmers are keen in transforming from traditional approach of farming to market-led approach. Farmers are now looking for the means and ways to shift from subsistence agriculture to market-oriented production. In this context, contract farming provides a unique opportunity to diversify their

production. With minimum risk, it motivates the farmers to take up a new venture. There is an unprecedented interest shown by all the stake holders of contract farming. After opening up of the Indian economy and entry of many domestic and multinational players into agribusiness sector, contract farming which was restricted now became the dominant and growing node of raw material production and procurement coordination among the processors and fresh produce marketers and exporters.

On the other hand, on advertising front, Indian agribusiness is yet confronting the issues, for example, low level of business sector reconciliation and integration, availability of dependable and convenient information needed by farmers on different issues in farming.

The agricultural policy 2000, promote the participation of private sector in agribusiness through contract farming and land bearing arrangement to accelerate technology transfer, capital inflows and assured market for crops. Contract farming is emerging as a prominent issue in agricultural in the context of globalization and liberalization.

Contract farming has emerged as an important phenomenon in the developed countries of the west during the 1950's. But it took time for developing countries. (MNC's), national corporation has brought, the system of the contract farming in developing countries. Such as India, during the late 1970's besides of multinational contract farming is also plasticized by state and parastatal agencies in many countries.

In an age of market liberalization, globalization and expanding agribusiness, difficulties arise for small scale farmers for participation, in market economy. Contract farming is a well-established concept in nation like India, but it is really new in India. The leading industrial houses, especially for which agriculture, produce farms an interest part of processing functions has shown significant interest in the practice.

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. Contract farming refers to a system where a central processing and exporting unit purchases the harvests of independent farmers and the terms of the purchases are arranged in advance through contract. Contract farming is a variable mechanism to overcome high risk and for building up of a long variable partnership for better marketing. However, well organized contract farming provides effective backwards and forward linkage and would appear to after an important way in which smaller produces can farm in a commercial manner. It also provides investors, reliable source of supply with the opportunities of guarantee.

The terms of the contract very and usually specified how much produce the contractor will buy and what price they will pay for it. The contractor frequently provides credit inputs and technical advice.

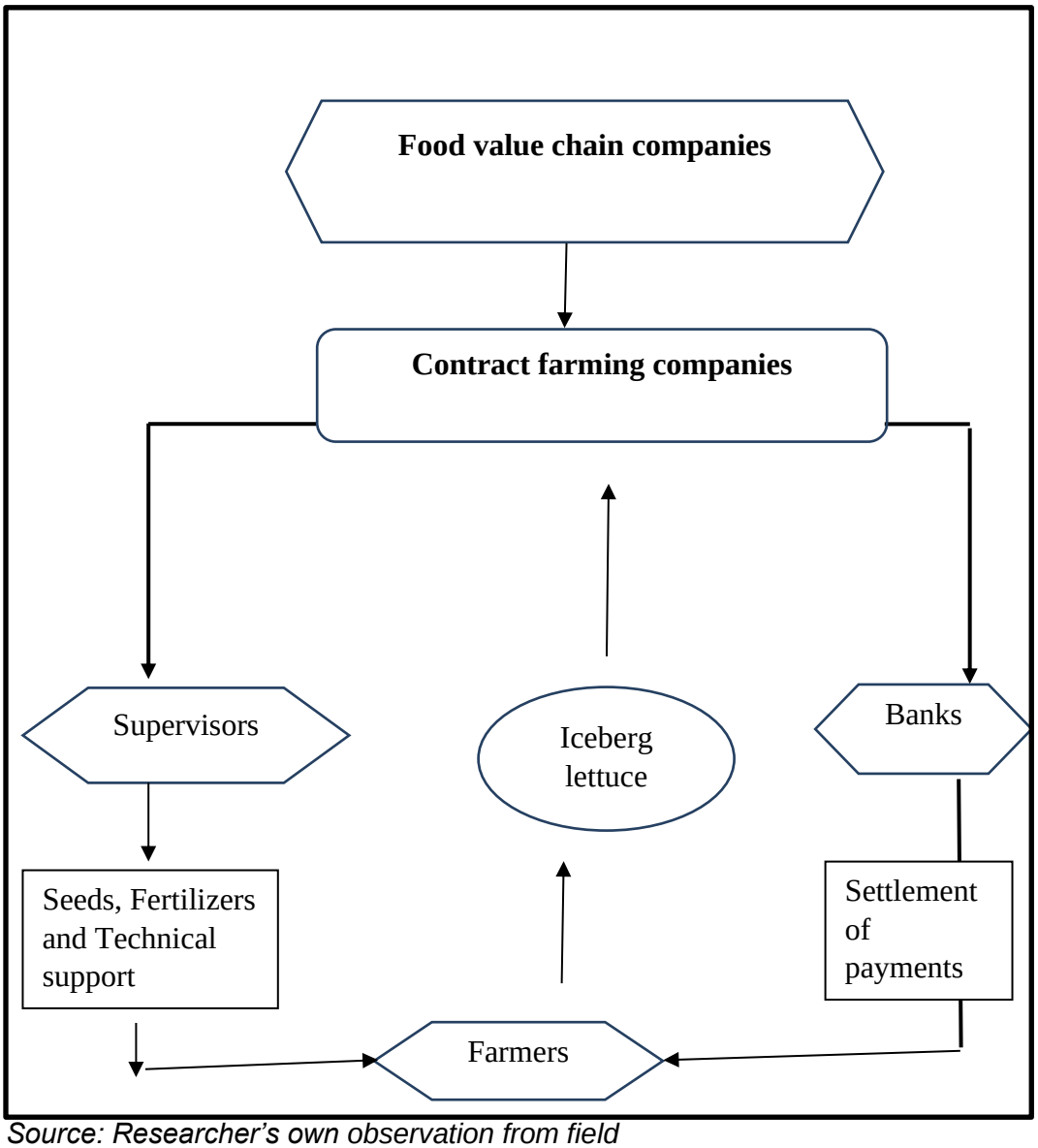
Contracting is fundamentally a way of allocating risk between producer and contractor, the former takes the risk of production and the letter the of namely in practice, there is considerable inter dependence between the two parties. It is attractive to the farmer because, as it gives him the access to additional source at capital, brings a new technology and ensures a more creation and more possibly better, price for his produce.

Under the control system, a farmer agrees to supply, a pre agreed quantity of a certain quality produce at a pre agreed price and time, to the processing or marketing firms which may or may not provide certain facilities like provision of inputs, finance etc. This happening as good quality, timely, raw material is a prerequisite for any successful agri-business firm, whether operating in the domestic or international market.

Since contract farming leads to change in the way agricultural production, processing and marketing are organized. It is important to understand its practice and dynamics.

Attempts by governments and development agencies to arrest this drift have tended to emphasize the identification of ‘income generation’ activities for rural people. Unfortunately, there is relatively little evidence that such attempts have borne fruit. This is largely because the necessary backward and forward market linkages are rarely in place .i.e., rural farmer 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 market for their output. Well organized contract farming does, however, provides such linkages, and would appear to puffer an important way in which smaller producer can farm in a commercial manner. Similarly, it also provides investors with the opportunity to guarantee a reliable source of supply from the perspectives of both quality and quantity. In the era of globalization, the concept of contract farming is an effective way to coordinate and promote production and marketing in agriculture.

Figure 1: Value chain partners



Source: Researcher's own observation from field

1.2 Introduction to Iceberg lettuce

Lettuce was originally farmed by the ancient Egyptians, who transformed it from a plant whose seeds were used to obtain oil into an important food crop raised for its succulent leaves and oil-rich seeds. Lettuce spread to the Greeks and Romans; the latter gave it the name *lactuca*, from which the English lettuce is derived. By 50 AD, many types were described, and lettuce appeared often in medieval writings, including several herbals. The

16th through 18th centuries saw the development of many varieties in Europe, and by the mid-18th century, cultivars were described that can still be found in gardens.

Lettuce (*Lactuca sativa*) is an annual plant of the daisy family, Asteraceae. It is most often grown as a leaf vegetable, but sometimes for its stem and seeds. Lettuce is most often used for salads, although it is also seen in other kinds of food, such as soups, sandwiches and wraps; it can also be grilled. One variety, the celtuce (asparagus lettuce), is grown for its stems, which are eaten either raw or cooked. In addition to its main use as a leafy green, it has also gathered religious and medicinal significance over centuries of human consumption. Europe and North America originally dominated the market for lettuce, but by the late 20th century the consumption of lettuce had spread throughout the world.

Lettuce is a rich source of vitamin K and vitamin A, and a moderate source of folate and iron. Contaminated lettuce is often a source of bacterial, viral, and parasitic outbreaks in humans, including E. coli and Salmonella.

Lettuces have a wide range of shapes and textures, from the dense heads of the iceberg type to the notched, scalloped, frilly or ruffly leaves of leaf varieties. Lettuce plants have a root system that includes a main taproot and smaller secondary roots. Some varieties, especially those found in the United States and Western Europe, have long, narrow taproots and a small set of secondary roots. Longer taproots and more extensive secondary systems are found in varieties from Asia.

Depending on the variety and time of year, lettuce generally lives 65–130 days from planting to harvesting. Because lettuce that flowers (through the process known as "bolting") becomes bitter and unsaleable, plants grown for consumption are rarely allowed to grow to maturity. Lettuce flowers

more quickly in hot temperatures, while freezing temperatures cause slower growth and sometimes damage to outer leaves.

Once plants move past the edible stage, they develop flower stalks up to 1 m (3 ft 3 in) high with small yellow blossoms. Like other members of the tribe Cichorieae, lettuce inflorescences (also known as flower heads or capitula) are composed of multiple florets, each with a modified calyx called a pappus (which becomes the feathery "parachute" of the fruit), a corolla of five petals fused into a ligule or strap, and the reproductive parts. These include fused anthers that form a tube which surrounds a style and bipartite stigma. As the anthers shed pollen, the style elongates to allow the stigmas, now coated with pollen, to emerge from the tube. The ovaries form compressed, obovate (teardrop-shaped) dry fruits that do not open at maturity, measuring 3 to 4 mm long. The fruits have 5–7 ribs on each side and are tipped by two rows of small white hairs. The pappus remains at the top of each fruit as a dispersal structure. Each fruit contains one seed, which can be white, yellow, grey or brown depending on the variety of lettuce.

Lettuce grows best in full sun in loose, nitrogen-rich soils with a pH of between 6.0 and 6.8. Heat generally prompts lettuce to bolt, with most varieties growing poorly above 24°C (75°F); cool temperatures prompt better performance, with 16 to 18°C (61 to 64°F) being preferred and as low as 7°C (45°F) being tolerated. Plants in hot areas that are provided partial shade during the hottest part of the day will bolt more slowly. Temperatures above 27°C (81°F) will generally result in poor or non-existent germination of lettuce seeds. After harvest, lettuce lasts the longest when kept at 0°C (32°F) and 96 percent humidity. Lettuce quickly degrades when stored with fruit such as apples, pears and bananas that release the ripening agent ethylene gas. The high-water content of lettuce (94.9 percent) creates problems when attempting to preserve the plant – it

cannot be successfully frozen, canned or dried and must be eaten fresh. Despite its high-water content, traditionally grown lettuce has a low water footprint, with 237 litres of water required for each kilogram of lettuce produced. Hydroponic growing methods can reduce this water consumption by nearly two orders of magnitude.

The domestication of lettuce over the centuries has resulted in several changes through selective breeding: delayed bolting, larger seeds, larger leaves and heads, better taste and texture, a lower latex content, and different leaf shapes and colours. Work in these areas continues through the present day. Scientific research into the genetic modification of lettuce is ongoing, with over 85 field trials taking place between 1992 and 2005 in the European Union and the United States to test modifications allowing greater herbicide tolerance, greater resistance to insects and fungi and slower bolting patterns. However, genetically modified lettuce is not currently used in commercial agriculture.

1.2.1 Production of lettuce

In 2020, world production of lettuce (report combined with chicory) was 28 million tonnes, with China alone producing 14.3 million tonnes or 51 per cent of the world total.

Lettuce is the only member of the genus Lactuca to be grown commercially. Although China is the top world producer of lettuce, most of the crop is consumed domestically. Spain is the world's largest exporter of lettuce, with the US ranking second.

Western Europe and North America were the original major markets for large-scale lettuce production. By the late 1900s, Asia, South America, Australia and Africa became more substantial markets. Different locations tended to prefer different types of lettuce, with butterhead prevailing in northern Europe and Great Britain, romaine in the Mediterranean and stem lettuce in China and Egypt. By the late 20th century, the preferred

types began to change, with crisp head, especially iceberg, lettuce becoming the dominant type in northern Europe and Great Britain and more popular in western Europe. In the US, no one type predominated until the early 20th century, when crisp head lettuces began gaining popularity. After the 1940s, with the development of iceberg lettuce, 95 per cent of the lettuce grown and consumed in the US was crisp head lettuce. By the end of the century, other types began to regain popularity and eventually made up over 30 per cent of production. Stem lettuce was first developed in China, where it remains primarily cultivated.

In the early 21st century, bagged salad products increased in the lettuce market, especially in the US were innovative packaging and shipping methods prolonged freshness.

In the United States in 2013, California (71%) and Arizona (29%) produced nearly all of the country's fresh head and leaf lettuce, with head lettuce yielding $9400 of value per acre and leaf lettuce $8000 per acre.

Table 1: Worldwide production of iceberg lettuce in 2019-20

Country	Production (Millions of tonnes)
China	14.3
United States	4.4
India	1.1
Spain	1
Italy	0.7
World	28

Source: United Nation Food and Agriculture Organization

Table 1 shows that country wise status of production of iceberg lettuce of year 2019-20. China rank 1st with the production of 14.3 MT followed by United States, India, Spain, and Italy with the production of 4.4, 1.1, 1 and 0.7 MT respectively.

1.6 Objectives of the Study

In today's scenario, it is alleged that private sector is entering into another kind of Green Revolution. It has been claimed that large scale corporate agriculture is more active than the present system of farming. It centrals to greater productivity, increase in output, income, exports and private investment. Stated that about 67 per cent of the India's poor live in rural areas, which are facing poverty needs to be addressed about the problems faced by the rural deprived. While the mainstream of these are farmers liable on agriculture and related activities for their sustenance, many do not produce adequate food or earn enough income to fulfill their basic necessities. Higher production does not necessarily means that it will lead to assured and higher incomes, specifically in the situations where markets are messy and unproductive, price variation is high, negotiating power is weak, or market access is less and limited.

Private sector investment will guarantee a market for the farmers' produce. In this context present study was conducted at farmers' level to study the problems and prospects of contract farming and its impact on farmers' income.

The specific objectives of study are:

1) To study contractual arrangements, institutional linkages and participation of farmers in the contract farming
2) To study the impact of contract farming on income generation for farmers
3) To identify the constraints faced by different stakeholders in Contract farming

2. Review of Literature

The comprehensive review of literature is an essential part of any scientific investigation. As such, attempt has been made to present brief and lucid details of the available literature in relating to present study. These literatures were helpful to identify which type of data was collected to fulfil the need of the objectives and then how to analyse the data.

Singh (2002) stated the proponents of agribusiness promotion, of which contract farming is a part, argue that it leads to big jumps in incomes and employment in agricultural backward regions and brings a break from low levels of productivity and instability in production, thus putting the local economy on a dynamic path of growth and development. This is possible not only because of the technological and capital resources of these firms, but also because of the international character of processes of agribusiness which allows access to international markets. The agribusiness firms take on risk by undertaking new projects in processing and marketing and provide a stream of cash flow to the local economy.

Miyata *et al.* (2008) identified the education of the head of household is weakly related to contract participation, but the relationship is U-shaped so there is no evidence of bias against less educated farmers. The distance to the house of the village head is a strong predictor of participation in the contract farming scheme, farmers living near the village head are significantly more likely to participate. This probably reflects a smaller ‘‘social distance” between the farmer and the village leader, as well as the interest of the packer in concentrating production in a small area. The results also revealed that that there is some selection (or self-selection) in becoming a contract farmer, but it is in terms of labour availability and location, rather than farm size. In the case of apple growers, contract farmers benefit from higher yields, presumably due to the technical

assistance and specialized inputs provided by the packers. In contrast, the yields of contract green onion growers are no larger than those of independent green onion growers, but the prices contract farmers receive from the packers are higher. Although their per-unit input costs are also higher, the higher price more than compensates for this, resulting in higher gross margins. It is likely that these higher prices received by contract growers reflect the higher quality made possible by the contract relationship.

Kumar and Kumar (2008) conducted a study to compute per-ha income for various crops under contract and non-contract farms and reported that among contract crops, the income generated by gherkin was highest (Rs 77066/ha), followed by baby corn (Rs 64681/ha) and paddy (Rs 31602/ha). Among noncontract crops, sunflower contributed the maximum (Rs 30477/ha), followed by groundnut and paddy. Sunflower was the only crop that yielded more income on non-contract than contract farms. It may be because the contract farmers devote their best land for the cultivation of contract crops and use relatively inferior land for cultivation of sunflower. The various constraints faced by farmers in contract farming are delayed payment for crop produce, lack of credit for crop production, scarcity of water for irrigation, frequent power cutting and difficulty in meeting quality requirements.

Sharma (2008) concluded with his results that education has a statistically significant and positive impact on farm income. Contract farming firms demand minimum quality standards from producers while traditional channels are not so strict about quality issues. Educated producers are more capable of meeting these standards. The coefficient of extension service by public agencies was found to be non-significant, which implies that public extension system is not very effective. Membership in farmers' group/association /cooperatives significantly determines participation in

contract farming. Membership is positively related to participation; if a farmer is a member of farmers' group/association/cooperatives, he/she is likely to participate in contract farming.

Chakraborty (2009) stated that contract farming is still an evolving institutional mechanism in India which is an instrument of agricultural and rural development, and not an end. A fair proportion of the ongoing contract farming is still oral in nature as a few states are yet to enforce relevant laws to get rid of initial apprehension there is need for building trust between the small farmers and corporate players.

Singh (2011) stated that performance of contract farming can be judged by the farmer satisfaction with contracts. The farmer satisfaction can be measured by the growers' interest in the contract system, number of farmers under the arrangement - growing or dwindling, contract compliance by the two parties, and the level and frequency of income and its distribution effects across classes of farmers. More specifically, it is captured through profitability of the crop, efficiency of payments and input supply, market assurance for the produce, and farmer participation in crucial decisions relating to contract production. Beyond immediate performance in terms of parameters of a contract, it can also be judged from the extent of inclusion or exclusion of small producers in each contract farming program or project.

Swain (2011) conducted a study and identified that crops grown under contract, the production have better productivity and farmers are efficient as compared to non-contract. In affixing, contract farmers could achieve higher productivity in growing contract product as compared to non-contract. Thus, Input like labour, pesticide/insecticide and fertiliser have shown a significant offering to total output of the contract output, and labour, pesticide/insecticide and fertiliser have shown insignificant

contribution to total output of non-contract commodity. The estimated result of technical efficiency observed that contract producer are efficient in growing contract crops (mean efficiency level – 89 per cent) than the non-contract ones (mean efficiency level -87 per cent). However, contract farmers are inefficient than non-contract farmers when it shift to non-contract product in Southern India.

Swain (2011) finding suggest that the average on-farm gross income is higher among contract farmers than the non-contract ones by about 106 per cent in the rice seed-growing region and it is higher by 110 per cent in the gherkin growing region. Further, per acre gross income is higher for contract farmers than for the non-contract ones. Non-farm income is higher among non-contract farmers compared to contract farmers in the gherkin-growing region, however, the opposite is in the rice seed-growing region. The total income from all sources is higher for contract farmers than non-contract ones by 93.65per cent in the rice seed-growing region and by 64.78 per cent in the gherkin growing region. The constraints faced by farmers include problems like poor coordination of activities, poor technical assistance, delay in payments and cheating even after procurement of output. More than one-fourth of rice seed farmers reported that the company has rejected the seed even after procurement. The same problems are faced by gherkin farmers. Crop damage on the way to factory is cited as the reason. Farmers note that the company cheats in different ways by taking advantage of their illiteracy.

Narayanan (2013) Conducted study on 474 farmers in four commodity sectors, gherkins, papaya marigold and broiler, an endogenous switching model is used to estimate net profits from participation. The study revealed that average treatments effect varies widely across contract commodities. Papaya and broiler contracting offer clear net gains for participants whereas marigold contracting leaves participants worse off.

For gherkins, while contracting holds net gains for participating farmers overall, this is true of contracts with some firms but not others. The standard deviations of point estimates of treatment effects are quite

large indicating variability in profit gains even within the same commodity sectors. Thus, notwithstanding the sign of average treatment effects, contract farming arrangements have diverse impacts on income for individual farmers and these could have implications for sustained participation of farmers in high value agriculture.

Yogi (2014) demonstrated that large farmers adopted conservation agriculture more easily than small and medium farmers. Different categories of farmers were chosen for the study based on land holding. Farmers with 0 - 2 hectares of land are classified as "small," farmers with 2 - 5 hectares of land are classified as "medium," and farmers with more than 5 hectares of land are classified as "Others."

Ratna (2015) collected sample of 60 vegetable growers in Himachal Pradesh's Kullu District to investigate the relationship of some socioeconomic variables with the productivity of selected vegetables. The study discovered that the most important socioeconomic factors are age, land holding size, and educational level. According to the findings, the educational level of the sample household's head has a direct relationship with the productivity of all vegetable crops. Farmers with less than 2 hectares of land produced more vegetables than farmers with more than 2 hectares of land.

Kumar *et al.* (2019) revealed that price setting is not transparent, both producers and consumers are often cheated. Price fixed only by mouth saying and at last the company may cheat farmer by purchasing at low prices as there is no bond between them, in same way if farmer gets higher price from other company, then he will sell to other only by cheating

the contracted company. Sometimes farmers are forced to use inputs supplied under contract for the purposes other than those they were intended for. They may choose to utilise the inputs on their other cash and subsistence crops or even to sell them. As a result, contracted crop yields were reduced, and the quality is affected.

3. Research Methodology

Research is all about addressing an issue or asking and answering a question or solving a problem. Research is a more formal way of going about asking questions in a structured way. This structure is called a methodology. Research comprises defining and redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deduction and reaching conclusions; and at last, carefully testing the conclusion to determine whether they fit the formulated hypothesis. It is a way to systematically solve the research problem. It may be assumed as science of studying how research is done scientifically. A project needs a plan and script that is to be followed to attain the objectives and to satisfy those objectives research is done that follows some requisite methodology. This chapter on methodology consists of the study area, sampling procedure, sources of data, analytical tools and techniques that are being used, etc. The chapter has the following major headings:

3.1 Collection of data
3.2 Research instrument
3.3 Study approach
3.4 Sampling
    3.4.1 Sample size
    3.4.2 Sampling Method
3.5 Analytical framework
3.6 Statistical Tools and Analysis
3.7 Area of Study
3.8 Limitations of the study

To fulfil the specified objectives of the study, Kullu district of Himachal Pradesh is being selected based on judgmental sampling, as this district has the major production belt of iceberg lettuce in Himachal Pradesh.

3.1 Collection of Data

Primary as well as secondary data was collected to meet the objectives of the study.

3.1.1 Primary data: Primary data was obtained through the pre-structured schedule by interviewing farmers, supervisors (Farm managers) and firm.

3.1.2 Secondary data: It was collected from Company reports, Government reports and relevant research papers.

3.2 Research Instrument

Pre-structured schedule was prepared. Schedule contained both open-ended and closed-ended questions from the farmers. Primary and secondary type of data is collected for the study.

3.3 Study Approach

The research approach was descriptive. Interview schedule was used as an instrument for collecting information, which had both open and close-ended questions. After collecting the information, tabulation was done and depending upon analysis and interpretation of facts and figures, a report is prepared.

3.4 Sampling

Multi-stage sampling method was adopted for the study. Judgemental sampling was used to collect data from those villages whose farmers were in contract farming.

In the first stage, a firm was identified which was involved in contract farming of iceberg lettuce and the necessary details were collected from them. In the second stage, based on discussion with the supervisors and directors of the company, a cluster of villages participating in contract farming was chosen. Finally, based on the farmers details maintained by the firm, 30 farmers who were under contract farming and 30 farmers who were not participating in contract farming but growing iceberg lettuce on their own were chosen as control units of study based on judgemental sampling.

3.4.1 Sample size

From each village 30 farmers (15 contracted famers and 15 non contracted farmers) were selected based on judgemental sampling and the total sample size were 60 farmers.

Table 2: Sample size

Sr. No.	Sample Unit	Sample Size
1.	Contract farmers	30
2.	Non-contract farmers	30

Source: Researcher's own computation from field data

3.4.2 Sampling method

From Kullu district two *tehsil* were taken and one village from Naggar *tehsil* and another village from Manali *tehsil* was selected based on Judgemental sampling.

Table 3: Sampling procedure of *tehsils* and villages from Kullu district

S.No.	Particulars	Sample size	Sampling procedure	Selection criteria
1	District	Kullu (1)	Judgemental sampling	Maximum area under cultivation
2	*Tehsil*	Naggar and Manali (02)	Judgemental sampling	Maximum area under cultivation
3	Village	Seobagh and Karjan (02)	Judgemental sampling	Maximum area under cultivation
4	Farmers	Contract farmers (30) Non-contract farmers (30)	Judgemental Sampling	Farmers who were in contract farming

Source: Researcher's own computation from field data

3.5 Analytical Framework

Tabular analysis of the collected data was done with the help of appropriate research analysis tools. The project was carried out to accomplish the stated objectives and subject to analysis and interpretation of facts and figures. The data were analysed using simple mathematical and statistical tools. Various analytical tools were used such as weighted average.

3.5.1 Weighted average

It is a mean determined by giving qualities in an informational index more impact as indicated by some characteristic of the information. It is an average in which every amount that will be arrived at the midpoint of is consigned a weight, and these weightings decide the general significance of every amount on the average. Weightings are what could be compared to having that many like things with a similar value engaged with the average.

3.5.2 Garrett's ranking

$$\text{Percent Position} = \frac{100\,(R_{ij}-0.5)}{N_j}$$

Where,

R_{ij} = Rank given for the i^{th} item by the j^{th} individual,

And

N_j = Number of items ranked by the j^{th} individual.

The percentage position of each rank was calculated and transformed into marks/scores using Garett table. For each constraint, marks of individual respondents/farmers were added together and were divided by total number of farmers/respondents for whom scores/marks were added. Thus, mean Garrett score for each constraint was graded by ordering them in the descendant order and then Garrett's ranking technique was used for ranking the constraints.

3.5.3 Standard deviation and coefficient of variation (MS Excel)

Production and price risk was found and calculated to compare the magnitude of production and price variations between contract and non-

contract farmers. To know the price and production risk factor, Standard Deviation (SD) and Co-efficient of Variation (CV) was calculated out by using the subsequent formula.

$$\text{Standard Deviation} = \sqrt{\frac{\sum fx^2 - n\bar{x}^2}{n-1}}$$

Where,

$\bar{x}$ = Average price

n = Number of observations

f = Frequency

$$\text{Co-efficient of Variation} = \frac{SD}{\bar{x}} * 100$$

3.5.4 Paired t-test (MS Excel)

$$t = \frac{\bar{d}\sqrt{n}}{s_{\bar{d}}}$$

$$s_{\bar{d}} = \sqrt{\frac{1}{(n-1)}\sum (d - \bar{d})^2}$$

d = Difference between the observations

n = Number of paired observations

3.5.4.1 Inference

Null Hypothesis: There is no impact of contract farming on farm income of farmers.

Alternate Hypothesis: There is impact of contract farming on farm income of farmers.

Null Hypothesis (p>0.05* Accept): There is no statistically significant difference between two variables.

Null Hypothesis (p<=0.05* Reject): There is statistically significant difference between two variables. *(At 5per cent L.O.S. and 95per cent confidence interval)

The procedure adopted is presented objective wise as follows:

3.6 Statistical Tools and Analysis

Objective 1: To study contractual arrangements, institutional linkages, and participation of farmers in the contract farming

The type of contracting arrangements was studied. It was studied whether farmers enter in verbal or written contractual arrangements. The relations of the contracting organisation with farmers during entire production process till procurement of final agro produce was there. The factors which influencing participation of farmers in contract farming was studied in this objective the data was generated in forms of table and rank was given for the influencing factors of contract making by farmers.

Objective 2: To study the impact of contract farming on income generation

The income generation in contract farming and non- contract farming was studied which was provided a window for having comparative analysis that

out of two contract and non- contract farming which one leads to more revenue generation. The costs involved in both the cases were studied.

The data collected about costs and income obtained by both contract and non-contract farmers were analysed by applying independent two sample t -test.

Null Hypothesis:- The contract farming do not have any impact on farm income of farmers.

Alternative Hypothesis:- The contract farming have a significant impact on farm income of farmers.

Objective 3: To identify the constraints faced by different stakeholders in contract farming

The constraints faced by stakeholders in contract farming were studied in this objective. The constraint faced by the Company and the farmers was studied under this objective. The Garret's ranking was used to identify and rank the constraints.

3.7 Area of Study

The study was conducted in the Naggar and Manali tehsils of Kullu district of Himachal Pradesh. To fulfil the specified objectives of the study, this district was selected as it was the major production belt of iceberg lettuce in Himachal Pradesh.

3.7.1 Introduction to area of study

Kullu district of Himachal Pradesh was well known for its cool weather and snow-capped mountains. Kullu was well known place in Himachal Pradesh where the exotic as well as the local vegetable production was going on extensively.

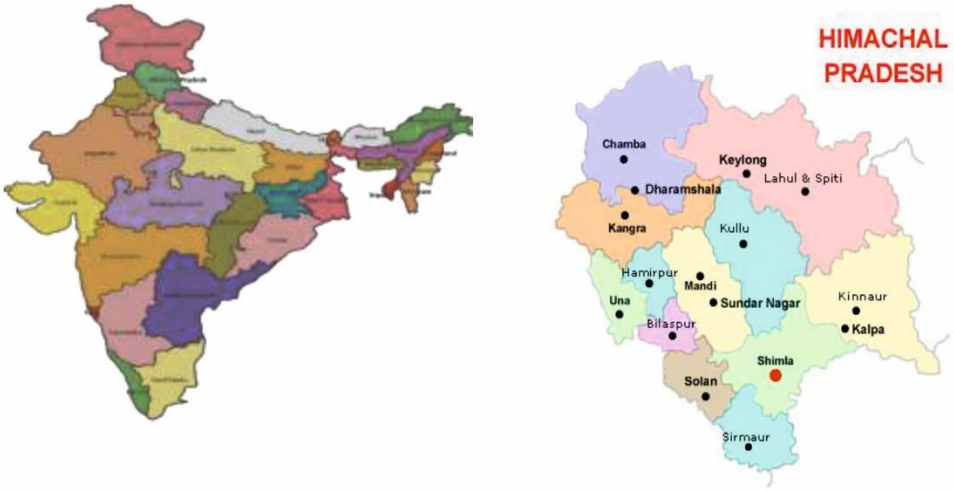
3.7.2 District profile

The Kullu district was in the northern part of Himachal Pradesh. The district Kullu was bounded by Lahaul Spiti and Kangra district. On the east and south-east by Kinnaur and Shimla districts and in the south by Mandi district. The total geographical area of the district was 5503 sq. kilometres which was 3.92 per cent of the total area of the Himachal Pradesh and ranks 12th amongst the districts. The topography of the district was mountainous with elevation ranging from 1500 meters to 4800 meters from above sea level. The district of Kullu forms a transitional zone between the lesser and Greater Himalayas and presents a typical rugged mountainous terrain. The district has high mountains, rivers, rivulets, and valleys. The district by and large was also climatically suitable for growth of temperate fruits.

Table 4: Profile of study area

Country	**India**
State	Himachal Pradesh
District	Kullu
Total area	5,503 km^2 (2,125 sq mi)
Density	80/km^2 (210/sq mi)
Time zone	UTC+05:30 (IST

Fig 2: District map of Kullu



Source:www.mapsofindia.com

3.8 Limitations of the study

1. Because of the time limitation survey should had to limit in a particular area.
2. The major limitation of this study was on the accuracy of income data and the methodological approach used. Income data were normally very difficult to get from farmers, as normally farmers give small of large figures conditional on what they anticipate getting.
3. The fact that farmers had to recall their statistics even reduces the reliability of the figures.
4. The disclosure of data from farmers' side was limited.

4. Findings and Analysis

After collection of data, tabulation was done, and then appropriate statistical techniques were used to get the results. The objective wise results and findings in detail are explained in this chapter.

4.1 Contractual Arrangements, Institutional Linkages and Participation of Farmers in the Contract Farming

4.1.1 Age wise classification of famers

The information was gathered from Iceberg lettuce growers of all ages, including both contract and non-contract farmers. This data collected was analysed to see if age played a significant role in contract farming decisions.

Table 5: Age profile of contract and non-contract farmers

Age profile	Contract farmers	Non-contract farmers
<=25 years	2(6.67%)	2(6.67%)
26-45 years	21 (70%)	19(63.33%)
>=46 years	7(23.33%)	9(30%)

Source: Researcher's own computation from field data

Table 5 shows that majority of contract farmers were middle age grouped which constitute 70 percent and followed by older farmers(more than 46 years).

4.1.2 Educational status of farmers

Table 6 contains information about educational background of both contract and non-contract farmers. This data was used to compare the educational status of both type of farmers in the study area.

Table 6 : Education status of contract and non-contract farmers

Education status	Contract farmers	Non-contract farmers
Illiterate	4(13.33%)	3(10%)
Primary	5(16.67%)	6(20%)
Senior Secondary	18(60%)	18(60%)
Graduate and Above	3(10%)	3(10%)

Source: Researcher's own computation from field data

Table 6 states that majority of contract farmers were qualified up to senior secondary level, which constitutes 60 percent and followed by primary education had 16.67 %.

4.1.3 Land holding of farmers

Land holdings of both type of farmers were collected. The major three groups have been constituted to compare the land size of contract and non-contract farmers.

Table 7: Land holdings of contract and non-contract farmers

Land holding(hac.)	Contract farmers	Non-contract farmers
Small (0 - 2)	9 (30%)	11 (37%)
Medium (2 - 5)	15 (50%)	18 (60%)
Others (>5)	6 (20%)	1 (3%)

Source: Researcher's own computation from field data

Table 7 shows that majority of contract farmers were small farmers which constitutes 36.67 percent and followed by medium farmers had a percentage of 33.33 while non-contract farmers were also came under small category which constitutes 46.67 percent followed by marginal farmers who had a percentage of 36.67.

4.1.4 Contractual arrangement

There was a written agreement between the company and the contract farmer but sometimes it was verbal agreement based on personal relation of supervisors. The company not only provided technical guidelines but also delivered the key inputs (seeds and fertilizers) to produceiceberg lettuce, at the farm gate on cost basis. Advance payments are not made, and the final payment is made through bank deposits. The price at which the company buys the produce is pre-determined. It is a kind of monopsonic situation. As company provides key inputs and assured market, farmer's risks are limited to production only.

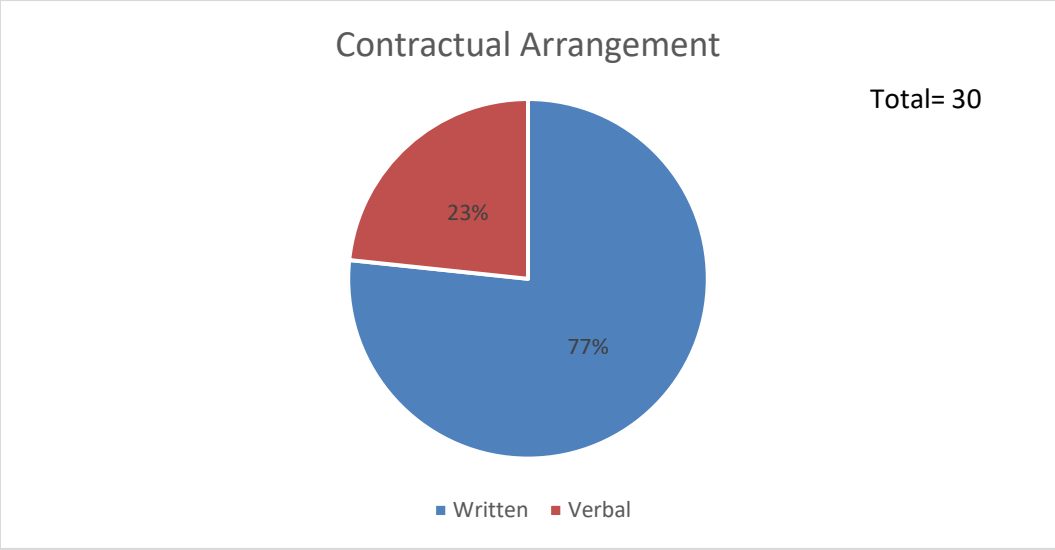
The main criteria for choosing farmers for contract werewillingness and resource endowment of the farmers (Specifically assured irrigation). The company supplied quality inputs such as seeds and fertilizers at cost and the technical know-how and procures output, thus providing vertical integration between the firm and the farmer. Payments were made after the procurement of the produce.

Table 8:Type of contractual arrangements of contract farmers

Type of contractual arrangement	No. of responses
Written	23 (77%)
Verbal	7 (23%)
Total	**30**

Source: Researcher's own computation from field data

Figure 3: Type of contractual arrangements of contract farmers



Source: Researcher's own computation from field data

4.1.5 Factors Influencing for participation of farmers in contract farming

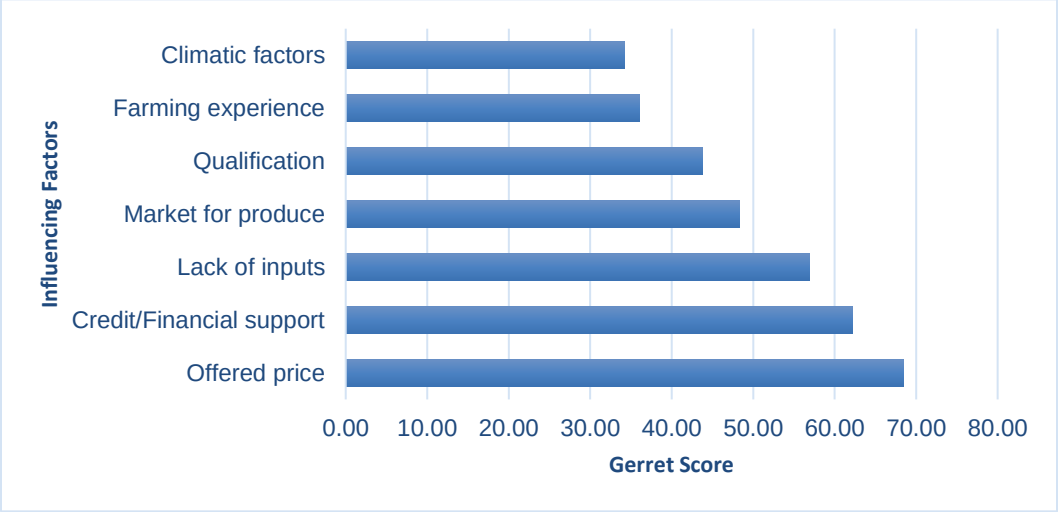
There are some factors influencing farmers for making contract for their future crops and listed as 7 selected factors viz. difficulty in meeting quality requirements, delay in payments, provision of inputs at higher cost, contracted price is lower than market prices, delay in procurement of crop produce, lack of credit for crop production, delay in input supply.

Table 9: Factors influencing participation of farmers in contract farming

Influencing factors	Average Score	Ranking
Offered price	2054	I
Credit/Financial support	1866	II
Lack of inputs	1707	III
Market for produce	1448	IV
Qualification	1315	V
Farming experience	1083	VI
Climatic factors	1027	VII

Source: Researcher's own computation from field data

Figure 4: Garret scores of factors influencing participation of farmers toward contract farming



Source: Researcher's own computation from field data

Figure 4 depicts that respondent had given ranks to all the 7 factors influencing them. Observed factors Garrett score ranged from 34.23 to 68.47. Data reveal that with a Garrett score of 68.47 the offered price for the farmer was the major factor. Whereas credit/ financial support was major factor influencing farmers with a score of 62.20. The third major factor influencing farmers was as they are having lack of inputs which was driving towards contract farming. Having accessibility for market for their produce was the fourth factor having garret score 48.27. Qualification, farming experience and climatic factors stands in the fifth, sixth, seventh position with the garret score of 43.83, 36.10, 34.23 respectively.

Objective 2: To study the impact of contract farming on income generation

4.2 .1 Cost of cultivation of iceberg lettuce under contact and non-contract farming

The results relevant to cost of cultivation of iceberg lettuce per acre under contract and non -contract farmers were presented in table 10.

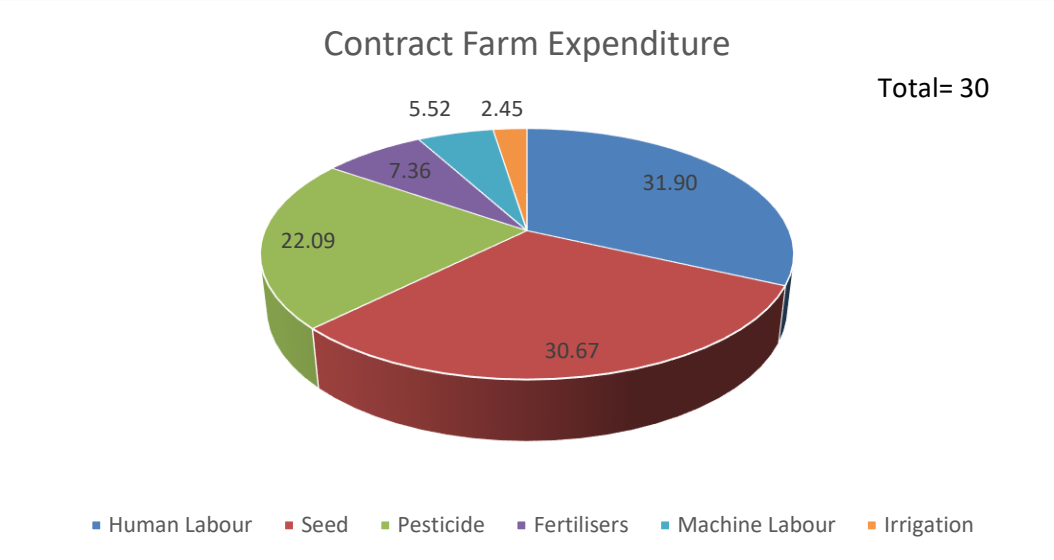
Table 10: Cost of cultivation of iceberg lettuce under contract and non-contract farmers during 2018-2019 (Rs/acre)

S.No.	Activity	Contract farming	Non-contract Farming
1	Human Labour	26000(31.90%)	18000(23.38%)
2	Machine Labour	4500(5.52%)	4500(5.84%)
3	Seed	25000(30.67%)	30000(38.96%)
4	Fertilisers	6000(7.36%)	7500(9.74%)
5	Pesticide	18000(22.09%)	15000(19.48%)
6	Irrigation	2000(2.45%)	2000(2.60%)
7	Total Input Cost	81500(100%)	77000(100%)

Source: Researcher's own computation from field data

It could be observed from table 11 that the contract and non-contract farming of iceberg lettuce cultivation incurred a total cost of Rs. 81500 and Rs. 77000 per acre respectively. The cost of cultivation under contract farming is higher than non-contract farming due to higher cost incurred towards human labour, and pesticides. The seed cost was high in conventional farms as the seed rate used was higher compared to contract farming. Expenditure on human labour was relatively higher in contract farming due to more family labour worked tomaintain the quality of iceberg lettuce for fulfilment of contract made with company.

Figure 5: Cost of cultivation of iceberg lettuce under contract farming

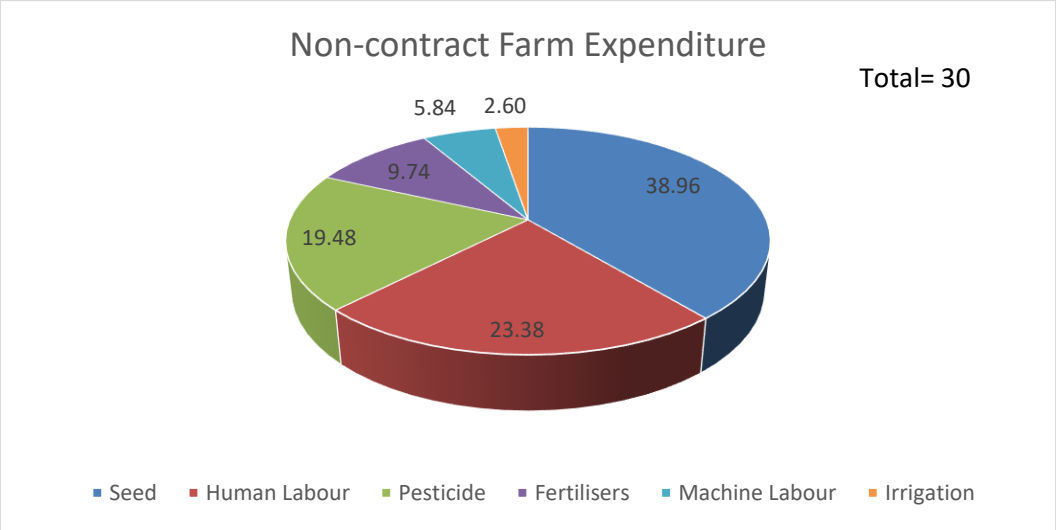


Source: Researcher's own computation from field data

Figure 5 shows the share of different inputs in total cost of cultivation of iceberg lettuce under contract farming. The table 4.6 shows that labour cost accounted 31.90 % in total cost of cultivation while machine cost 5.52 %, seed cost 30.67 %, fertilizer cost 7.36 %, and pesticides cost account

22.09 % and irrigation 2.45 % in total cost of cultivation under contract farming of iceberg lettuce.

Figure 6: Cost of cultivation of iceberg lettuce under non-contract farming



Source: Researcher's own computation from field data

Figure 6 shows that for iceberg lettuce cultivation under non-contract farming, the maximum cost was incurred for seed accounting 38.96 %, cost of machine was 5.84 %, labour cost 23.38 %, cost of fertilizer 9.74 %, cost of pesticides accounted 19.48 %, and irrigation cost 2.60 %.

4.2.2 Production and price risk of contract farmers vis-à-vis non-contract farmers

Table 12 states that both contract and non-contract farmers faced production risk as indicated by higher CV. However, the amount of production risk was higher in non-contract farmers i.e., 11.14 % as compared to that of contract farmers which is 15.62.This was mainly since contract farmers received higher quality seedlings at subsidized rates, whereas non-contract farmers had sown locally available variety of seeds. It is evident from the table that there was high price risk linked in the case

of non-contract farmers as indicated by CV of about 22.05 %. In terms of price risk, contract farmers are better compensated because the company provides market purchase support, ensuring an assured market and verified purchasing arrangements at a pre-determined price.As a result, contract farming aids and protects against price risk. The level of risk linked with market and price has decreased because of this. This is one of the most significant advantages of contract farming. As a result, contract farmers have less production and price risk than non-contract farmers.

Table 11: Production and price risk of contract farmers vis-à-vis non-contract farmers

Production and price risk of contract farmers vis-à-vis non-contract farmers			
S.No.	**Particulars**	**Contract farmers**	**Non-contract farmers**
1	Production Risk		
a	Mean (Kg)	10835.67	9412.59
b	S.D. (Kg)	1207.62	1469.80
c	C.V. (%)	11.14	15.62
2	Price Risk		
a	Mean (Rs./Kg)	20.00	18.73
b	S.D. (Rs./Kg)	0.00	4.13
c	C.V. (%)	0.00	22.05

Source: Researcher's own computation from field data

4.2.3 Comparative cost structure of lettuce cultivation under contract and non-contract farming

The major farm inputs used to produce iceberg lettuce in contract farming and non-contract farming are mentioned in Table 13. It was observed that through the contract farming, farmers can save 20 % fertilizers, and 16.67 % seed compared to non-contracted farming of iceberg lettuce

Table 12: Comparative cost structure of lettuce cultivation under contract and non-contract farming

S. No.	Particulars	Contract farming	Non-Contract Farming	Change Over Non-contract farming	% Change
1	Human Labour(Rs)	26000	18000	8000	44.44
2	Machine Labour	4500	4500	0	0.00
3	Seed	25000	30000	-5000	-16.67
4	Fertilisers	6000	7500	-1500	-20.00
5	Pesticide	18000	15000	3000	20.00
6	Irrigation	2000	2000	0	0.00
7	Total Cost	81500	77000	4500	5.84
8	Yield(Kg/Acre)	10835.67	9412.60	1423.07	15.12
9	Price(Rs/Kg)	20.00	18.73	1.27	6.76
10	Gross Returns	216713.49	176329.37	40384.12	22.90
11	Net Returns	135213.49	99329.37	35884.12	36.13

Source: Researcher's own computation from field data

4.2.4 Gross and net returns from lettuce cultivation (Per Acre)

It is clear from Table 14 farmers under contract farming received a price of Rs. 20/per Kg and their net profits of Rs. 1,35,213 compared to the non-contract farmers, they also received Rs.18.73/ per Kg but they got low net profits i.e., Rs. 95788.42. Contract farmers despite of having higher cost of cultivation gained higher net profits than non-contract farmers in the study.

Table 13: Gross and net returns from lettuce cultivation (Per Acre)

S.No.	Particulars	Contract farming	Non-Contract Farming
1	Yield (kg.)	10835.67	9412.58
2	Price (Rs.)	20	18.73
3	Gross Returns (Rs.)	216713.49	172788.42
4	Total cost of Production (Rs)	81500	77000
5	Net returns (Rs.)	135213.49	95788.42
6	Cost of Production per Kg (Rs)	8	8.18
7	Net returns per Kg (Rs.)	12.47	10.55

Source: Researcher's own computation from field data

4.2.5 Impact of contract farming on farm income (Per Acre)

The contract farmers received an annual income of Rs. 3,19,583 while non-contract farmers, received Rs. 2,50,683.Farmers received a large portion of their net returns from the iceberg lettuce production due to contract farming. From Table 15, shows that net change comes out to be Rs. 68,900 and with percent change of 27.48% between contract and non-contract farming.

Table 14: Impact of contract farming on farm income (Per Acre)

S. No.	Particulars	Annual Income (Rs.)
		Crops
1	Contract Farms	319583.33
2	Non-contract farms	250683.33
3	Net Change	68900
4	Percent Change	27.48
5	Paired t-value	5.14
6	Significance value-P(T<=t) one-tail	0.0000085910
7	Significance value-P(T<=t) two-tail	0.0000171821

Source: Researcher's own computation from field data

A paired t-test was used to assess the influence of contract farming on farm income. This test is used to examine the complexity of two closely related tests, and it is also being used in a study to look at the farm income of contract and non-contract farmers.

The data for this analysis came from two dependent samples, and the sample data for non-contract farmers' farm income was compared to the sample data for contract farmers' farm revenue to see if contract farming has a positive or negative impact on farm income. A comparison of such two samples was included in the paired comparison. To obtain results and draw inferences, the paired t-test was used in MS Excel.

Hypothesis

Null Hypothesis: There is no impact of contract farming on annual income of farmers.

Alternate Hypothesis: There is impact of contract farming on annual income of farmers

Null Hypothesis (p>0.05 Accept)

Null Hypothesis (p<=0.05 Reject)

Inference

Significant at 5% L.O.S. as p<0.05, we reject Null Hypothesis i.e. There is impact of contract farming on farmers income; There is statistically significant difference between two variables.

4.3 Constraints Faced by Different Stakeholders in Contract Farming

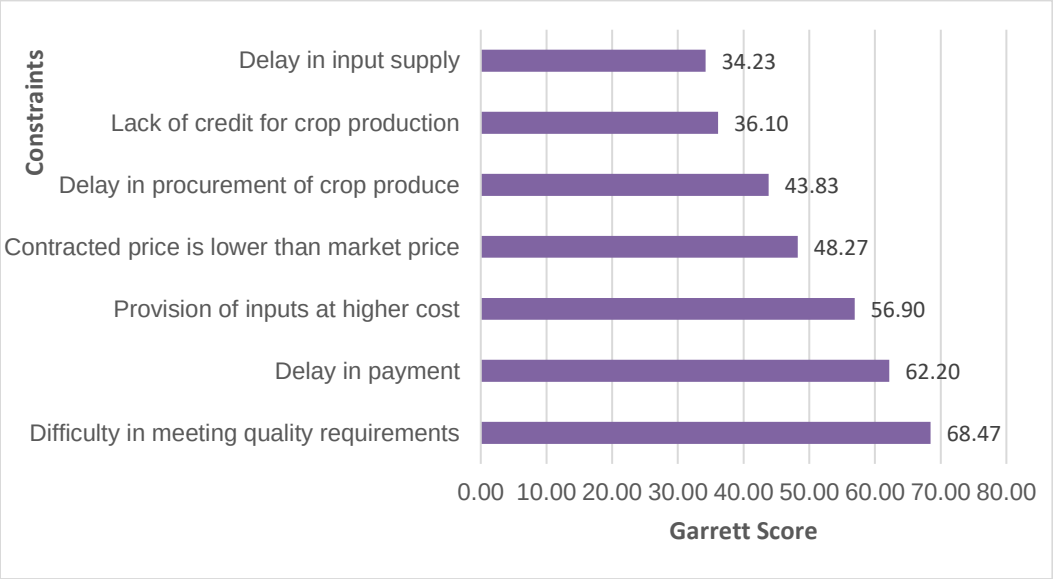
The constraintsfaced by the farmers in contract farming referred to the 7 selected factors viz. difficulty in meeting quality requirements, delay in payments, lower contracted price for crop produce, provision of inputs facilities at higher cost, delay in procurement of crop produce, delay in inputs supply and lack of credit for crop produce.

Table 15: Ranking of various constraints faced by farmers in contract farming based on Garrett score

Constraints	Average score	Ranking
Difficulty in meeting quality requirements	**68.67**	**I**
Delay in payment	**62.2**	**II**
Provision of inputs at higher cost	**56.9**	**III**
Contracted price is lower than market price	**48.67**	**IV**
Delay in procurement of crop produce	**43.83**	**V**
Lack of credit for crop production	**36.1**	**VI**
Delay in input supply	**34.23**	**VII**

Source: Researcher's own computation from field data

Figure 7: Garret scores of constraints faced by farmers in contract farming



Source: Researcher's own computation from field data

Figure 7 depicts that respondent had given ranks to all the 7 factors of constraints faced by them and data was presented in Table 4.11. Observed constraints Garrett score ranged from 68.47 to 34.23. Data revealed that with a Garrett score of 68.47 difficulty in meeting quality requirements was the major constraint faced by farmers. Whereas delay in payments was a major problem faced by farmers with a score of 62.20. The third major constraint faced by farmers was provision of inputs at higher cost with a score of 56.90 as farmers often feel that inputs facilities and supplies being provided by company are of high amount. Farmers were not satisfied with the contract price, and this has become a constraint with a significant Garrett score of 48.27. Farmers also facing constraint in delay in procurement of produce with Garret score of 43.83 which stands in fifth position. Farmers were not happy with the payment process and marking lack of credit for crop production obtaining a garret score of 36.10. The minor constraint facing by the farmers was delay in input supply as it was ranked 7 with a garret score of 34.23

4.3.2 Constraints faced by company in contract farming

Following discussions with several stakeholders of the concerned organization, various constraints experienced by them were identified, which are stated below.

1. Excessive rental rates for transport vehicles and unavailability during peak season.
2. Inability to provide adequate transportation for farmers due to a poor road network, strikes, and other factors.
3. Farmers breaking the terms and conditions.
4. Farmers selling their produce to other businesses.
5. Farmer's failure to maintain quality.

5. Conclusion and Recommendations

Contract farming was an institutional pact/arrangement where the farmer agrees to produce the contractor company's crop on his own land. The price of produce and amount to be purchased are already pre-determined. Contract farming holds the potential to help upgrade small and marginal farmers and integrate them into agricultural value chains.

5.1 Conclusions

- Adoption of contract farming is prominent in the middle age group i.e. (26 – 45 years). The non- contract farming is more prominent in the higher age group i.e. (more than 46 years) of farmers.
- Contract farming is preferred by the farmers who have large land holdings i.e. (more than five hectares of land). The farmers having less than five hectares of land choose non- contract farming in the study area.
- Farmers mostly participate in the contract farming as they are majorly influenced by the company offered price which stands in the first position followed by the credit/financial support and having lack of inputs.
- The total cost of production in case of contract farmers was Rs. 81,500 while for non-contract farmers was Rs.77,000
- In case of contract farmers out of total cost of production, human labour was the most expensive input which constitutes 31.91% against 23.38% in the case of non -contract farmers
- In case of non- contract farmers out of total cost of production, seed costs were significantly higher than those of others which contributes 38.96%

- Farmers under contract received net returns of Rs. 12.47 per kg of iceberg lettuce while non-contract farmers received Rs. 10.55 per kg of iceberg lettuce.
- Gross returns for contract farmers were Rs. 216713.49 while for non-contract farmers were Rs. 172788.42
- The sample contract farmers received an annual income of Rs. 319583.33. While non-contract farmers, they received Rs. 250683.33 for every annum. The net change turns out to be Rs. 68,900 and with positive percent change of 27.48% between contract farms and non-contract farms.
- Major constraints faced by the farmers are difficulty in meeting quality requirements followed by delay in payments and provision of inputs at higher costs.
- The company's major constraints are farmers' contract voidability and inability to meet predetermined quality parameters.

5.2 Recommendations

- There should be frequent product price revision depending on the changes in input prices to maintain the stability of net returns for iceberg lettuce contract farmers.
- If required, the contract should be translated into regional language for a better understanding of the terms and conditions
- All the transactions should be recorded by a specific authority constituted by the state or the central government.
- Involvement of the judiciary should be increased so that farmers can have a body to address their grievances.
- Government should provide some incentives to corporations so that they can be encouraged to enter more contracts.

- Programs should be conducted in every rural area, to impart the basic legal knowledge, technical skills, and benefits of contract farming.

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Contents

List of Tables

List of Figures

List of Appendices