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A Review on Contract Farming in Punjab: Benefits, Challenges and Policy Recommendations

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ABSTRACT

Contract farming is widely regarded as a win-win arrangement for farmers and firms in many countries. Empirical studies in developing economies provide valuable insights into adopting contract farming and its associated outcomes. In Punjab, numerous contract farming companies are actively operating. However, a comprehensive study examining the advantages and disadvantages of contract farming in the region remains absent. This review paper seeks to address this gap by analyzing contract farming in Punjab, focusing on its benefits and challenges for farmers and sponsoring companies, comparing costs and returns and offering policy recommendations to enhance its effectiveness and success in the state. The review included 30 research papers on contract farming in Punjab. Twenty-nine of thirty papers highlighted the benefits of contract farming, such as increased incomes, stable prices, reliable markets, and opportunities for crop diversification beyond wheat and paddy. On the other hand, twenty-two out of thirty also discussed some prominent challenges contract growers face, including limited access to inputs, a bias towards large-scale farmers, delayed payments, insufficient technical support and high production costs. Additionally, only nine out of the 30 papers discussed some significant challenges faced by sponsoring companies, including farmer misconduct, contract violations, a shortage of skilled labor and crop failures. To improve the implementation of contract farming in Punjab, various measures have been proposed, including legal protections, the introduction of crop insurance policies, financial support for farmers, the establishment of a robust policy framework, encouraging greater participation from public and private companies, regular contract reviews and ensuring the inclusion of small-scale farmers. Implementing these measures is crucial for improving the effectiveness and sustainability of contract farming in the region.

Keywords : Contract farming, Farmers, Crop diversification, Crop insurance, Assured market

DURING the green revolution, Punjab helped India become self-sufficient in producing certain crops like wheat and rice (Gulati *et al.,* 2021). Punjab is India's third-largest producer of food grains, accounting for 9.17 per cent of the country's total food grain production, with an output of 30.24 million tonnes (MoAFW, 2023). In the 2022-23 agricultural year, the state ranked third in wheat production, contributing 16.78 million tonnes (15.18% of the national total) and fourth in rice production, with 12.99 million tonnes (9.57% of the national total). The monoculture of wheat and paddy has led to some serious ecological and economic problems in the state, like the continuous decline in the water table, soil degradation due to over-irrigation, surplus straw burning, which cause air pollution and pose health hazards to both humans and animals in the state in its neighbor states, soil salinity due excessive use of fertilizers by the farmers for enhancing their farm yields, reduction of soil fertility due to continuous

cultivation and lack of crop rotation and widening the gap between the demand and supply of specific produces in the market Kaur (2018c). The Punjab state cultivates rice on 2.6 m ha and nearly 16 m tonnes of paddy straw is produced, which eventually is destroyed by burning. This action by the farmers has negatively affected the lives of millions of people in Punjab and its neighboring states like Haryana, Delhi, Rajasthan and Himachal Pradesh Murthy *et al.* (2019). The Johl committee (1986) recommended that 20 per cent of the land under wheat and rice be converted to other crops Kaur *et al.* (2021). Moreover, farmers' excessive use of fertilizers has negatively affected soil fertility, decreasing productivity and lowering farmers' income. To address these significant challenges, the Johl committee proposed contract farming as a solution. Under the liberalization, privatization and globalization era, many developing countries, including India, followed a paradigm shift from subsistence agriculture to commercialized agri-business, allowing public and private companies to participate in producing and processing agricultural produce Jiyawan *et al.* (2009).

Contract farming facilitates a closer relationship and integration between farmers and firms, both in terms of inputs (backward integration) and outputs (forward integration) Minot and Sawyer (2016). It provides farmers access to better and necessary inputs and technical guidance that significantly enhance their productivity and yields (Sharma, 2002) and allocates production and marketing risk between farmers and sponsors Kharumnuid *et al.* (2017). Therefore, Contract farming in many countries is considered a win-win situation for the farmer and firm Singh (2005). Empirical studies in developing economies offer various insights into adopting contract farming and the returns it generates. However, no comprehensive study thoroughly examines the merits and demerits of contract farming experiences in Punjab. This review paper addresses this gap by focusing on contract farming in Punjab, analyzing its benefits and challenges for farmers and sponsoring companies, comparing costs and returns and providing policy recommendations to enhance the effectiveness and success of contract farming in the state.

Methodology

The Study provides a comprehensive analysis of contract farming implementation in Punjab. It is a descriptive study that synthesizes existing literature, focusing on the merits, challenges, costs, returns and recommendations for improving the contract farming system. The analysis incorporates findings from various research conducted by scientists and scholars. Insights were gathered through an extensive review of research papers and relevant websites.

Articles were acquired through the following search engines: Google Scholar, Krishikosh, Scopus, Web of Science and Research Gate. These search engines were used as they provide easy access to various literature on contract farming. Various terminologies related to contract farming - including corporate farming, backward and forward integration, the Johl Committee, liberalization and privatization, farmers, commercial farming, diversification, employment and other relevant terms were utilized to collect and extract the necessary data. The peer-reviewed literature is presented in Table 1, which outlines the criteria for selecting articles.

Table 1

Summary of the inclusion and exclusion criteria applied in the review process

Inclusion Criteria	Exclusion Criteria
Papers published in English	Papers published in other languages
Papers published between 2000 and 2024	All papers published before 2000
Work-related to contract farming	Work-related to general normal farming
Journals, Research Papers /Reports accessible online	Journals, ResearchPapers /Reports inaccessible online

In conclusion, the study employed a comprehensive approach to gather and synthesize data from various sources. This approach provided us with a deep understanding of the merits, cost and return analysis, challenges and policy suggestions for better implementation of contract farming systems extracted from diverse sources, underscoring the ongoing potential for changes in contract farming.

Fig. 1, illustrates the number of publications on this topic across different periods, which was seven between 2000 and 2005 and declined to five from 2006 to 2010. Further, from 2011 to 2015, the number of publications decreased to four, on contract farming. The number of papers increased significantly between 2016 and 2020 and the total number of research papers reached nine. Again, from 2021 onwards, the number decreased drastically to five. The pattern demonstrates varying interest in contract farming research in Punjab, India. It began steadily, declined, reached a notable peak and then declined slightly.

Fig. 2, illustrates the total number of papers discussing the advantages and disadvantages of contract farming for farmers and the challenges the contracting firms encountered. After reviewing the literature on contract

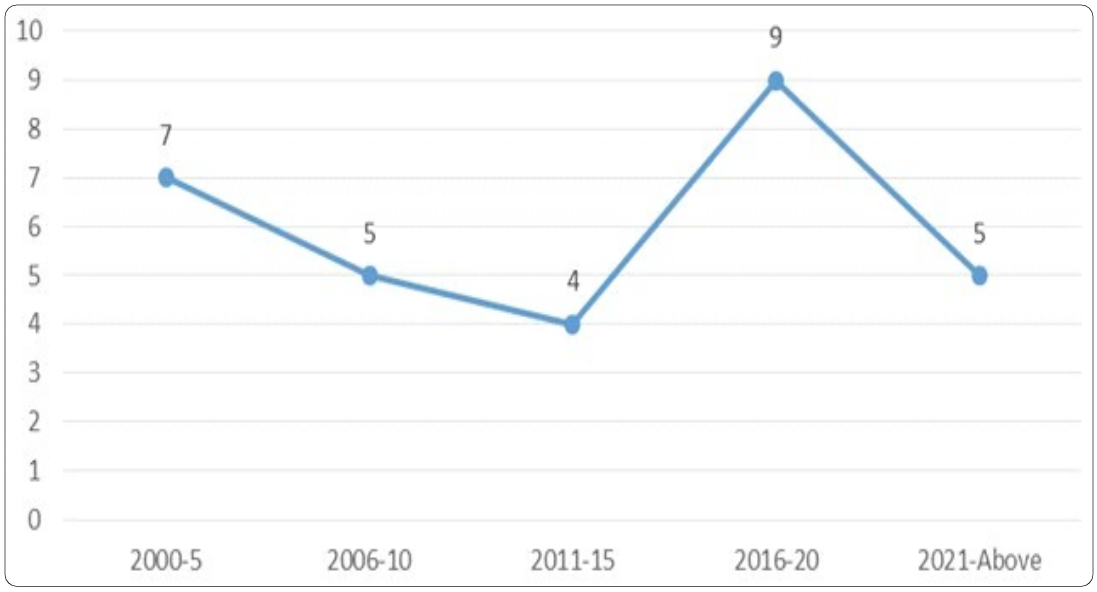

Fig. 1: Trends of publications on contract farming in Punjab, India.

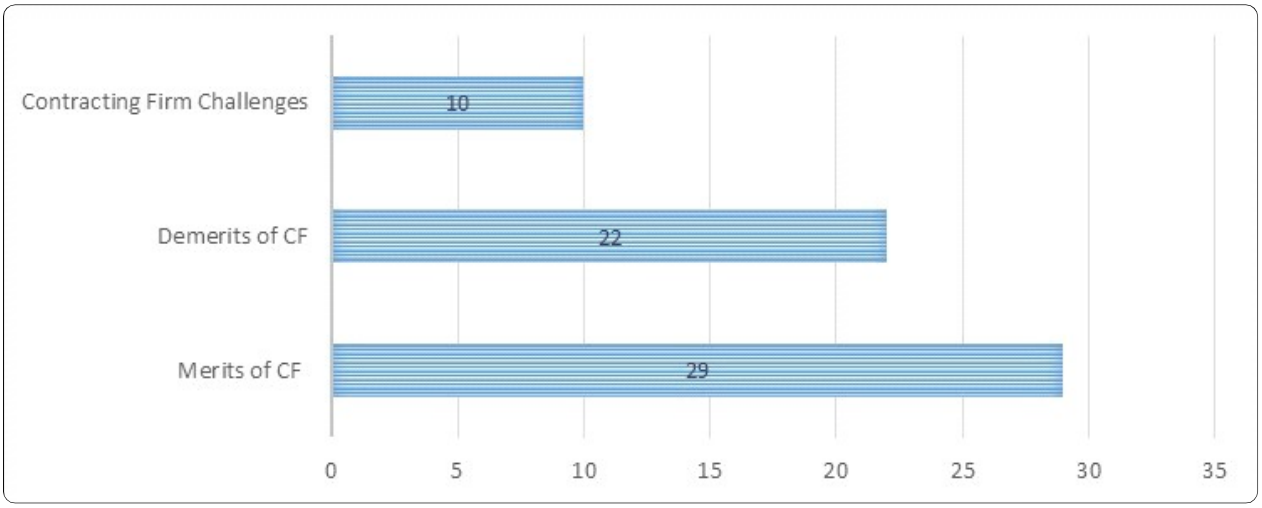

Fig. 2 : Studies on CF: Benefits, Drawbacks for Farmers and Firm Challenges

farming, particularly in Punjab, the researchers identified a substantial number of studies addressing both the benefits and challenges farmers face and the difficulties faced by contracting firms. In total, this review includes 30 papers on contract farming in Punjab.

The review of all 30 research papers jointly discussed the merits and demerits of contract farming to the farmers and the difficulties the contracting agencies faced. After reviewing these 30 papers, the reviewers found that 29 studies highlighted various merits of the contract farming practices for growers. At the same time, a significant number of papers - 22 out of these 30 research papers have also talked about some challenges faced by the farmers engaged in contract farming. Moreover, only 10 of these 30 papers mentioned some common challenges that contracting companies encounter. It indicates a need for more comprehensive research that explores not only the benefits for farmers but also the advantages for contracting firms and policy recommendations to enhance the success of contract farming in the region.

The Fig. 3, shows various advantages of contract farming for farmers. As mentioned in Fig. 2, in the Punjab state of India, we found (29) out of (30) research papers on contract farming discussed various merits to the farmers. After the review, we found that contract farmers' higher income than non-contract growers is the most mentioned merit of contract farming by the researchers (8), Followed by reliable market (7), assured price (6), technical knowledge (6), crop diversification (4), employment generation (4), and better yield (3) research papers.

Advantages of Contract Farming to Farmers

Assured Price : The agricultural market's fluctuation caused by the absence of an organized and regulated system has long been a challenge for Indian farmers. Farmers often face significant losses without fixed and reasonable prices for their produce, reducing their share in the consumer price. These losses typically occur during the peak season when supply exceeds demand, drastically lowering crop prices. Most farmers, especially smallholders, lack adequate storage facilities and are forced to sell their produce at low prices rather than risk spoilage. Contract farming offers a solution by providing pre-fixed prices agreed upon by farmers and the contracting company, stabilizing income and reducing financial risks. Sharma (2002) reported that the three main benefits of contract farming to the farmers were assured market, assured price and more profitable than non-contract farming. Kumar and Singh (2007), Sharma (2014) and Kaur and Singla (2024) discovered that fixed pricing is crucial for encouraging contract farming among farmers. Similarly, Kharumnuid *et al.* (2017) found that assured price, with a mean score of

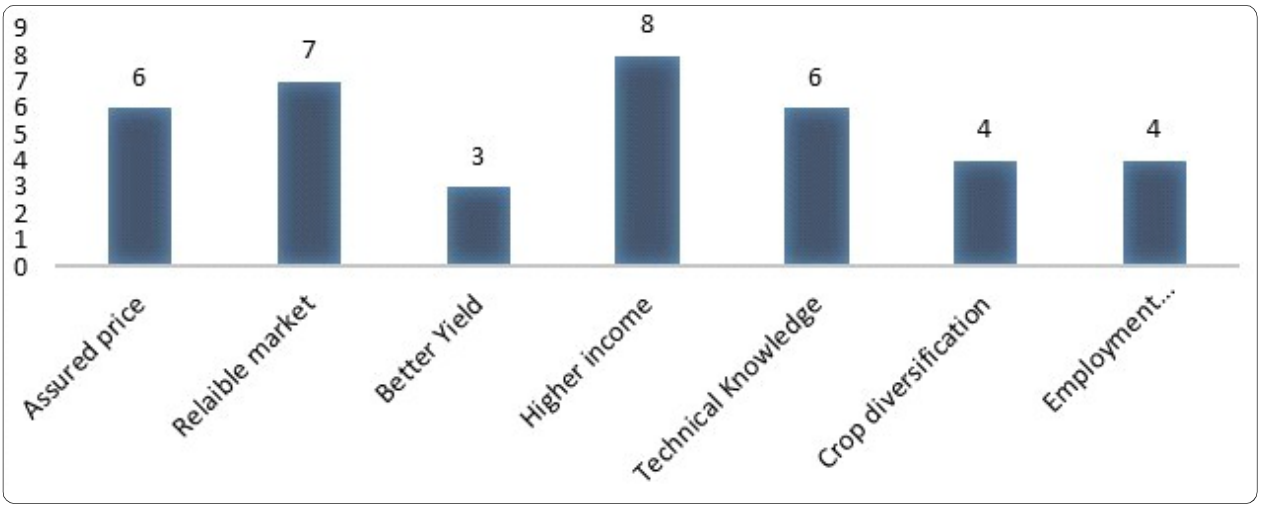

Fig. 3 : Advantages of Contract Farming for Farmers

4.57, was the top motivating factor for farmers' participation in contract farming. Similarly, Kuar's (2018c) study findings showed that 80 per cent of the contract farmers argued that they adopted contract farming for the stable prices provided by the company.

Access to Reliable Market : The assured agricultural produce market provides farmers with a reliable and stable platform to market their crops at fair and better prices. Indian farmers, mainly fruit and vegetable growers, encounter significant challenges in storing their produce due to the lack of a stable and reasonable market, inadequate storage facilities, and insufficient infrastructure. Consequently, a substantial portion of their produce is lost or spoiled, leading to considerable financial losses. Contract farming is a viable solution to protect farmers from such losses, providing farmers and companies access to a stable and specific market. Dhillon and Singh (2006), Singh (2007), Singh (2017) and Kaur and Singla (2024) highlighted in their research that an assured market is a key factor influencing farmers' participation in farming. Similarly, Kharumnuid *et al.* (2017) found that the assured market, with a score of 4.27, is one of the main factors of farmers' engagement in the contract farming system. Further, Kumar (2007) argues that finding a buyer at their doorstep is one of the critical factors of farmers persuading towards contract farming in the area. Likewise, Kaur (2018c) found that most (64%) respondents believed that the assured market is the second crucial factor of farmers' engagement in contract farming practices.

Better Yield : Farmers often adopt the most profitable combination of crops to maintain price advantages and maximize their returns. Higher yield is a prominent factor influencing the decision to participate in contract farming. Contract farmers often produce higher yields than non-contract farmers due to various factors. These include access to high-quality inputs such as seeds, fertilizers and pesticides supplied by contracting businesses, which are critical for increasing crop output and quality. Contract farmers also receive expert support and training on optimum farming practices, pest management and practical resource usage, which leads to improved crop management Dhanwantri and Bhalla (2014). Kumar (2006) pointed out that the average value of output per household for direct contract farmers (Rs.13,87,000) was nearly double that of non-contract farmers (Rs.6,93,000), while indirect contract farmers had a lower output than direct contract farmers (Rs.11,22,000). Geetanjali *et al.* (2021) noted a modest variation in yield within the Hoshiarpur district of Punjab, where 75.51 per cent of contract potato growers attained yields of 90-120 quintals per acre, compared to just 55.10 per cent of non-contract growers achieving the same yield range.

Higher-income : Farmers' income is crucial in determining food security and rural lifestyles in the agricultural sector. Several factors influence it, including government policies, crop yields, market pricing and production costs. Maintaining agricultural production and improving the standard of living for farmers' families depend on providing a steady and adequate income for them. Agriculture can become more resilient and prosperous if the potential and constraints of increasing farmers' income are addressed. Contract farming plays a crucial role in enhancing farmers' income. Geetanjali *et al.* (2021) found that the majority of the potato growers (77.55%) of contract and 44.89 per cent of non-contract respondents got Rs.1500-Rs.2000 per quintal in Hoshiarpur district of Punjab. Sharma's (2001) study, conducted in the Hoshiarpur and Amritsar districts of Punjab, supports the above findings. It revealed that tomato cultivation under contract farming generated 50.09 percent higher net returns than conventional wheat farming. Similarly, chilli crops under contract farming achieved 46.08 per cent higher net returns than non-contract paddy cultivation. Singh (2017) found that contract farmers of tomatoes in Amritsar district gained 13.48 per cent higher income than non-contract growers. According to Singh (2007), farmers believed that the potential for higher income compared to independent farming was a key factor influencing their decision to participate in contract farming.

Table 2
Net Returns: Contract vs. Non-Contract Farmers

Author	Location	Type of farming	Crops	Net return Per acre (in Rs.)
Singh and Raj (2019)	Amritsar, Jalandhar, Hoshiarpur & Gurdaspur	CF	Basmati	30706.42
			Potatoes	72110.99
			Maize	32761.88
			Tomato	97335.97
		NCF	Basmati	26891.98
			Potatoes	51345.73
			Maize	24298.84
			Tomato	74603.85
Singh and Sidana (2017)	Amritsar, Jalandhar, Gurdaspur, Hoshiarpur and Tarn Taran	CF	Chicory	22,493.32
		NCF	Wheat	16,808.02
Kaur and Singla (2018)	Moga Tarn Taran and Amritsar	CF	Sugar beet	10200.4
			Chicory	19450
		NCF	Wheat	5230.1
			Wheat	4601.7
Ravinder *et al.* (2006)	Punjab	CF	Flower seed	12,696.58
			Ice and Verbena	34,237.47
		NCF	Wheat	8,450.67

Singh and Raj (2019) found that contract farming resulted in average gross income gains of 9.69, 28.06, 43.21 and 26.31 per cent for Basmati rice, potatoes, maize and tomatoes, respectively. Singh and Sidana (2017) reported net returns of Rs.22,493.32 per acre for chicory under contract farming across five districts of Punjab *viz.,* Amritsar, Jalandhar, Gurdaspur, Hoshiarpur and Tarn Taran. In comparison, wheat farming yielded Rs.16,808.02 per acre, showing a difference of Rs.5,685.30 in favor of chicory. Kaur and Singla (2018b) found that cultivators of sugar beet and chicory under contract farming earned per acre net profits of Rs.10,200.40 and Rs.19,450, respectively, while independent wheat growers had lower per acre net returns of Rs.5,230.10 and Rs.4,601.70 in the Tarn Taran and Amritsar districts. Furthermore, Ravinder *et al.* (2006) conducted a comparative analysis showing that contract farmers' net returns for flower seeds were significantly higher, with the Ice seed variety yielding Rs.12,696.58 per acre and the Verbena variety Rs.34,237.47 per acre, compared to Rs.8,450.67 per acre for independent wheat growers**.**

Technical Knowledge : Technical guidance is crucial for enhancing farm productivity, leading to increased yields and higher incomes for farmers. However, many farmers still rely on traditional cultivation and harvesting methods for various crops, which has significantly reduced their overall yields. Kaur (2021) reported that post-harvest losses at the producer level in tomato production were estimated at 18.23 q/acre in the Amritsar district of Punjab. Additionally, many farmers in Punjab lack awareness of proper fertilizer usage, often applying twice the recommended amount, which results in soil depletion and salinity problems. Furthermore, farmers face challenges with improper irrigation schedules and poor management of various farm diseases, which negatively impact their yields and overall productivity. Contract farming effectively addresses these challenges by offering farmers technical guidance on critical aspects such as the

correct timing and quantity of fertilizer application, proper irrigation schedules and disease management. Dhillon and Singh (2006) emphasized that technical guidance is crucial in convincing farmers to participate in contract farming, as contractors offer all the necessary inputs, knowledge and technical support. Research studies by Kharumnuid *et al.* (2017), Kaur and Singla (2024) and Singh (2017) further support this, noting that one of the primary reasons farmers engage in contract farming is the agricultural extension services provided by sponsoring companies. Goel (2014) examined the Impact of contract farming on Basmati rice cultivation in Punjab, India, finding that contract farmers receive free technical training from field supervisors. This training emphasizes key aspects such as nursery growth, field preparation, transplantation, top dressing, pest management, drainage and proper harvesting and threshing of paddy to minimize fungal infections and other diseases.

Crop Diversification : The monoculture of paddy and wheat became popular after introducing high Yield Variety (HYV) seeds in 1960 Chaitra and Jeyavel (2024). The monoculture of wheat and rice has not only led to a decline in water levels but has also been associated with heavy pesticide use, resulting in health-related issues. Additionally, mismatches in the demand and supply of produce, both in terms of quality and quantity, have contributed to a decline in farm income. These issues are compelling farmers and the state government to rethink the agricultural system in Punjab. Scholars and analysts have recommended various strategies for crop diversification in the Punjab. Crop diversification depends on various factors categorized into demand-driven and supply-driven factors. Demand-driven factors include urbanization, literacy rates, and per capita income. Supply-driven factors generally encompass infrastructure facilities such as irrigation, electricity, road length, marketing societies, and fertilizers Deogharia (2018). Sharma and Singh (2013), Kaur and Singla (2024) and Sharma (2015) proposed contract farming as a means to encourage crop diversification in Punjab. Similarly, Kharumnuid *et al.* (2017) conducted a study on potato seed in the Jalandhar district of Punjab, which revealed that diversification was one of the key motivational factors encouraging farmers to adopt contract farming, with a mean score of 4.23.

Employment Generation : Punjab's agricultural mechanization emerged primarily due to using High-Yield Varieties (HYVs) of seeds and the intensification of agricultural inputs during the Green Revolution in the 1960s Jian *et al.,* (2016). This shift, however, resulted in serious unemployment problems in the state. Contract farming is generally more common in producing and processing labor-intensive cash crops such as potatoes, tomatoes, chilies, groundnuts, sunflowers, moong, cotton, okra, carrots, etc. These labor-intensive crops require more labor for harvesting, grading and packaging in the fields and offer a potential solution for unemployment Jian *et al.* (2016). Similarly, agricultural diversification aims to stabilize farmers' income and employment by cultivating various crops or utilizing modern technologies for the same crops Kaur *et al.* (2021).

Additionally, the processing, transportation, packaging and marketing post-farm stages further contribute to labor demand and can help reduce the seasonal employment rate and offer higher wages through competition in the labor market Singh (2005). The difference in employment generation is quite evident in the research findings of Singh and Sidana (2017). Their Study indicates that the total cost of human labor under contract farming was Rs.33,577.30 per hectare in chicory production, compared to Rs.10,815.75 per hectare in wheat production under non-contract farming practices. Similarly, the total machine labor expenses were Rs.9,476.10 per hectare for contract farming and Rs.4,544.15 per hectare for non-contract farming. Likewise, Kaur *et al.* (2021) reported that potato production under contract farming generated slightly higher employment (26.7 person-days per acre) for one contracted crop season, compared to 21.46 person-days per acre for non-contracted potato crops.

The figure above illustrates various challenges contract growers faced, which were identified by different research studies. In Fig. 2, 22 out of 30 papers

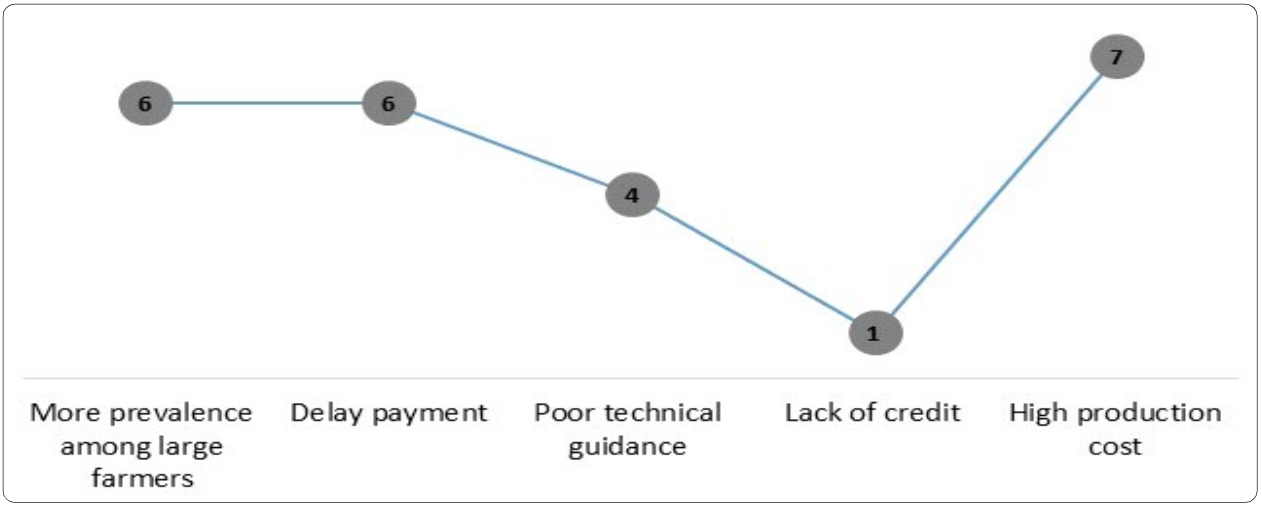

Fig. 4 : Challenges faced by farmers in Contract Farming in Punjab

discussed various challenges farmers face in contract farming. In those papers, the high production cost is more frequently mentioned than other (8) times. This was followed by more prevalence among large farmers (6) times, delayed payment (6) times, and poor technical guidance (4) times.

More Prevalence of Contract Farming among Large Farmers : The nature of the farmer, whether marginal, small or large, has been a significant factor in contract farming. In contract farming, both parties aim to improve their yield and income by boosting productivity and reducing production and processing costs. Contracting companies prefer to work with farmers with relatively large landholdings close to the company premises. This proximity reduces transportation costs and saves time for field extension workers who need to inspect the farms and provide guidance efficiently. Consequently, contracting companies favor engaging with larger and more centrally located farmers. Singh (2002) reported that multinational companies (MNCs) deal with relatively large producers, such as Kaur and Singla (2024). Sharma (2016) revealed that large farmers constitute a significant proportion of the contract population, with a share of 55.80 percent and 49 percent for potato and Basmati rice, respectively. Further, Kumar's (2007) study showed that 62 percent of the total number of contract growers belong to the category of large farmers. Similarly, Singh's (2007) findings concur with these results. Due to their high capacity to undertake risks, Dhillon and Singh (2006) indicated that large farmers find open markets more lucrative than tying an agreement with private companies.

Delay Payment : Farmers prefer prompt payments for their crop sales because they need to cover the costs of hired labor, repay bank loans, purchase supplies for the next planting season and manage other essential financial obligations to keep their operations running smoothly. In contract farming, farmers often delay receiving their remuneration due to the lengthy payment processes employed by sponsor companies. Consequently, delayed payments are recognized as a significant drawback of contract farming. Addressing this challenge requires the strict implementation of policies and regulations to ensure timely payments for farmers in the future. Singh (2005), Kumar *et al.* (2013), Mishra *et al.* (2022), Sharma (2014) and Singh (2017) research found that postponing farmers' payments is one of the problems faced by farmers in contract farming. Timely payments from some companies are a significant reason farmers participate in contract farming. Goel (2014) found prompt payment by PepsiCo to its contract farmers, with accounts typically settled within a week, even though the contract's stipulated time is ten to 12

days. This is considered an advantage of contract farming of Basmati rice over independent crop farming.

Poor Technical Guidance : On the side of the case, providing technical knowledge to contract growers regarding best farming practices and effective and efficient use of necessary inputs provided by the contracting companies plays a crucial role in enhancing the productivity level and maintaining the soil fertility of the fields for a long time. In the majority of the contract farming agreements, both parties agree upon providing and receiving technical guidance on different input utilization for cultivating, sowing methods, crop irrigation timetables, post-harvesting management and so on, adhering to such guidance by the technical teams of the contracting firms can help the farmers in increasing their farm yields and crops quality level. However, in some cases, due to the company's employee's negligence, farmers confronting difficulties in accessing on-time and practical guidance can lead to dissatisfaction and lower quality and quantity of outputs. According to Singh (2005), Sharma (2014), Kumar *et al.* (2013) and Singh and Sidana (2017), studies demonstrate that poor and irregular guidance to the farmers is considered a significant challenge in the contract farming practice. For contract farming to become more successful in the state, companies must pay adequate attention to regular supervision and actively seek feedback from farmers regarding the services provided by their technical teams.

Lack of Credit : Farmers need significant funds to purchase inputs for crop production, such as quality seeds, fertilizers, pesticides and labor for sowing, harvesting, packing and grading. They also need money to fulfill their household needs. Small and marginal farmers, in particular, often cannot afford all their farming and livelihood necessities on their own. While many firms provide required inputs for farming, some agreements do not include any credit provisions for the growers. This lack of credit remains a critical issue in contract farming, hampering farmers' ability to invest in inputs, adopt advanced technologies and meet personal and household expenses. Singh (2006) highlights that the non-availability of credit in

Table 3

Cost comparison between contract and con-contract farmers

Author	Location	Type of farming	Crops	Cost per acre (in Rs.)
Kaur (2018c)	Amritsar, Ludhiana, Moga and Tarn Taran	CF	Potato	47,456.50
		NCF	Potato	33,294.10
Singh and Sidana (2017)	Amritsar, Jalandhar, Gurdaspur, Hoshiarpur and Tarn Taran	CF	Chicory	59619.83
		NCF	Wheat	25550.23
Sharma (2016)	Jalandhar, Ludhiana and Fatehgarh	CF	Potato Basmati	23,182.57 9,115.72
		NCF	Potato Basmati	19,203.83 7,927.46
Kharumnuid *et al.* (2017)	Jalandhar	CF	Potato seed	25,660.80
		NCF	Potato seed	22,722.99
Kumar (2006)	Ferozepur, Hoshiarpur, Jalandhar, Ludhiana, Moga, Patiala and Sangrur	CF	different crops	27,641
		NCF	different crops	22,964

contract farming is a controversial topic and a significant challenge identified by most farmers in his Study.

High Production Cost : Contract farming mainly involves the production of cash crops, which are more labor-intensive due to their sowing methods, harvesting, packing, grading and processing compared to cereal crops. Despite this, contract farming uses quality inputs such as seeds, fertilizers, pesticides and fungicides to achieve higher and standardized outputs. Consequently, this approach produces higher production costs than independent farming (Sharma, 2014) and Kaur and Singla (2024). For many farmers, mainly marginal and small-scale farmers, investing in such high-cost crops is a significant challenge due to their poor financial status and limited access to credit facilities. This financial burden makes contract farming a complex and risky choice for them despite its potential for higher returns.

Kumar (2005) reported that contract farming has higher costs due to extension services, registration fees, transportation and seed costs, which the respondents in the area rank. Similarly, Kaur (2018c) found that contract potato farmers faced higher production costs, amounting to Rs.47,456 per acre, compared to Rs.33,294 per acre for non-contract farmers. Furthermore, Singh and Sidana (2017) found that the production cost of chicory under contract farming was Rs.59,619.83 per acre, more than double the cost of wheat cultivation by independent growers, which was estimated Rs.25,550.23 per acre. Sharma (2016) compared the production costs of potato and basmati rice. The total per-acre production cost for potatoes among contract farmers was Rs.23,182.57, slightly higher than Rs.19,203.83 for non-contract farmers. Similarly, the total production cost for basmati rice was Rs.9,115.72 per acre for contract growers and Rs.7,927.46 for independent farmers. A study by Kharumnuid *et al.* (2017) on potato seed showed that production expenditures under contract farming were Rs.63,412.67 per hectare, higher than the Rs.56,160.00 per hectare for non-contract farmers. Additionally, Kumar (2006) found that average production expenses across different crops were higher under contract farming at Rs.27,641 per acre, compared to Rs.22,964 per acre for non-contract growers.

Fig. 5, highlights the number of research papers discussing sponsor firms' challenges in agreements with farmers to cultivate and produce farm products. The figure above illustrates various challenges contracting companies face. After reviewing 30 research papers, we found that only 10 studies discussed the difficulties faced by contracting companies, in addition to examining the benefits and

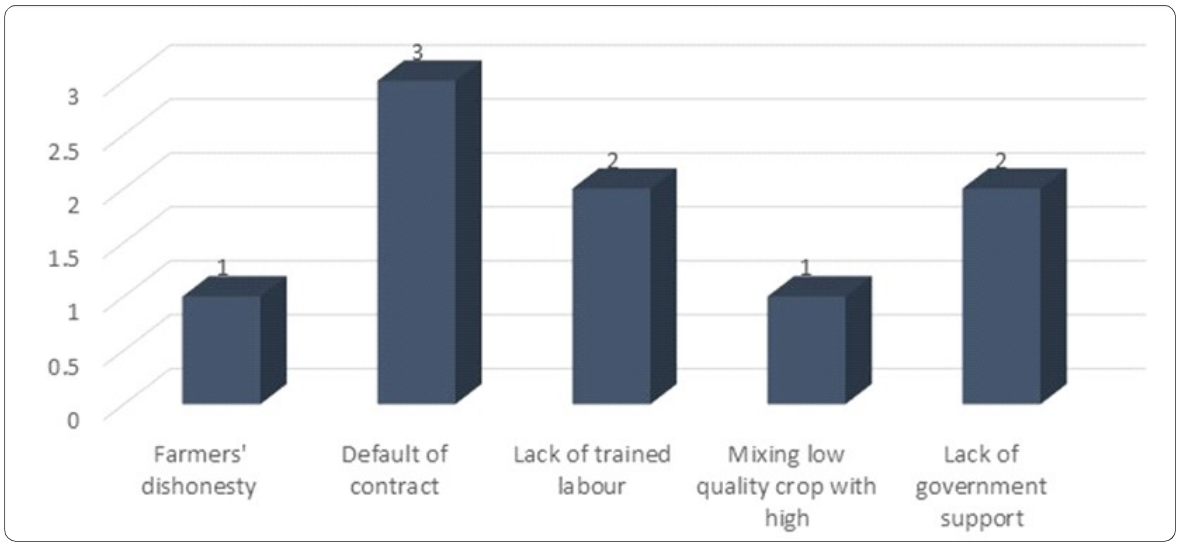

Fig. 5 : Challenges faced by the contracting company

challenges of contract farming for farmers. It is clear from Fig. 5 that contract defaults by farmers due to non-compliance with the agreed norms and conditions are one of the most highly noticed by research studies (3). Other issues included a lack of trained labour (2), insufficient government support (2), farmers' dishonesty (1) and the mixing of low-quality crops with high-quality ones, which is only once mentioned in all papers. All these challenges are elaborated with further details in the following paragraphs:

Farmers' Misconduct : Dishonesty in contract farming can take several forms, eroding the trust and trustworthiness of agreements. Farmers engage in side-selling, preferring to sell their produce to other purchasers who offer better prices rather than honoring their contracts, as Kumar (2005) and Sharma (2014) reported. Dhillon and Singh (2006) highlighted misrepresentation of inputs as a key concern, where farmers falsely claim to have used the specified inputs or agricultural practices outlined in the contract, ultimately affecting the quality and yield of the produce. Furthermore, they reported that farmer dishonesty is one of the significant challenges contract farming companies face.

Default of Contract : A contract farming breach can occur when either party fails to adhere to the agreed-upon terms. Farmers may breach contracts if they find open market prices significantly higher than the contracted prices, opting to sell their produce in the open market instead Singh (2022) and Sharma (2001). According to Singh (2000), the default rate surpasses 50 per cent when the contract price and market price gap becomes substantially large (greater than 3-50 times). Additionally, if farmers divert the company's inputs to crops other than the contracted ones, the relationship between the parties can be strained, leading to a breach of the agreement.

Breaches are not solely attributable to the farmers. Companies can also fail to adhere to the terms and conditions. For instance, it constitutes a breach if the company does not purchase all the contracted crops due to not meeting the high-quality parameters set in the agreement Singh (2000). Furthermore, Singh (2005) noted that, in some cases, companies do not establish written agreements with farmers, creating opportunities for both parties to deviate from the farming arrangement easily. In such cases, it is difficult for the company to recover its seeds/seedling costs Singh (2002).

Lack of Trained and Technical Workers : Skilled and well-experienced labor is crucial in effectively and efficiently managing farming operations within contract farming systems. These workers ensure smooth farming practices by adhering to stringent company farming methods and regulations. Their expertise spans the utilization of proper inputs, monitoring crop health, post-harvest management practices, and proficiency in technology use. This comprehensive skill set is essential for meeting the strict quality parameters set by the contracting company, ultimately achieving high-quality outputs. Sharma (2001) stated that contracting companies faced a shortage of skilled labor during tomato harvesting, which coincides with the wheat harvest, and chili harvesting, which overlaps with the rice harvest, leading to labor shortages. Similarly, Ravinder *et al.* (2006) believe that the lack of technical know-how about flower cultivation among farmers is a serious problem that firms face when practicing flower seed farming.

Crop Failure : Crop failures often occur due to natural calamities such as floods, droughts, plant diseases and earthquakes, which can significantly damage crops. Poor soil conditions, inadequate irrigation and limited access to modern agricultural technologies can also contribute to crop failures. Marginal and small farmers are particularly vulnerable compared to larger farmers, primarily due to their weakened economic status, limited resources and heavy reliance on farming for their livelihood and it is considered one of the reasons farmers commit suicide due to crop failure and indebtedness in the state.

Contract agreements often protect firms from all unforeseen obligations Singh (2000), whereas farmers must fulfill their contract obligations under all circumstances. They receive no compensation, even

TABLE 4
Policy suggestions

Policy suggestions	Authors
Legal Protections for Contract Growers : Legal protections should be in place to protect them from problems such as contract violations, payment delays, price reductions and unfair rejections to guarantee farmers that they can benefit fully from contract farming.	Mishra *et al.* (2022); Singh (2020); Kaur and Singla (2018b); Singh (2000); Dhillon and Singh (2006); Kumar (2006); Sharma (2001); Singh (2020); Sharma (2016); Kumar (2007); Kharumnuid *et al.* (2017); Goel (2014); Kumar (2005).
Enhancing Crop Quality through Comprehensive Farmer Training : The contracting firms should offer comprehensive training to farmers to help them produce high-quality crops. This will assist farmers in reducing the company's rejection rate of their products.	1.Mishra *et al.* (2022); Kumar (2006).
Affordable Financial Support for Farmers : Contracting companies should offer financial support to farmers, such as interest-free loans or loans with interest rates lower than the market average.	Mishra *et al*. (2022), Singh (2020), Singh (2005), Kumar (2005), Singh (2017)
Include Crop Insurance : The contract should include crop insurance provisions to compensate farmers for losses caused by adverse weather conditions.	Mishra et al. (2022), Singh (2005), Kumar (2005), Singh (2007)
Encourage Public-Private Partnerships to Promote Contract Farming : It is also recommended that more private and public partnerships should be encouraged in the state to promote contract farming by making production and procurement agreements with the farmers.	Sharma and Singh (2013), Kumar (2006), Kharumnuid *et al.* (2017)
Mandate Inclusion of Small Farmers with Incentives : To ensure that agribusiness companies must include small and marginal farmers in their network, the government may enforce specific requirements and offer incentives to these companies to include a confident percentage of small and marginal farms in their total contracts	Singh (2022), Kumar (2006), Sharma (2016), Singh (2005), Singh (2007), Kaur, P. (2018c), Kharumnuid, *et al.* (2017)

in crop failure caused by natural calamities. Dhillon and Singh (2006) reported that crop failure and lack of compensation by companies are significant issues in contract farming.

Mixing Low-quality Crops with High : In contract farming, mixing low-quality produce and high-quality agricultural produce by the farmers usually takes place when farmers face economic pressure, inadequate labor force and lack of resources, and due to the dishonesty of farmers, the quality produce with high-quality plots, doing so will not cause financial burden to the contract company however, it will also result in time waste of the firms to regrade them. Therefore, such issues remain critical in contract farming practice. Mishra *et al.* (2022) research on flower seed production in Ludhiana and Patiala districts pointed out the mixing of poor quality seed problem at the top ranking faced by the contract firms as it necessitates the firm's staff to put more of their efforts into separating good quality product from lower ones.

Currently, in the Punjab state of India, agriculture has a monoculture status where two crops, mainly wheat and rice, dominate among the farmers. The main

motive behind this is the presence of a Minimum Support Price (MSP) by the government and the provision of subsidies in the form of fertilizers and electricity, free of cost. The current monoculture practices in agriculture have resulted in the deterioration of land quality in terms of soil salinity due to the excessive use of fertilizers provided to farmers in the form of subsidies, depletion of the groundwater table, a decline in soil health and pollution from burning surplus straw, which mainly occurs after paddy harvesting in late October and the early November. After the reaping season, peasants burn wheat and paddy straws, which produce excessive smoke that pollutes the air in Punjab and its neighboring states such as Haryana, Rajasthan, Uttar Pradesh and Delhi.

In 1986, the Johl Committee, an expert panel on agricultural diversification in Punjab, recommended converting 20 per cent of the state's agricultural land from wheat and paddy to other competitive and profitable crops. To achieve this, the committee suggested contract farming as an effective strategy for crop diversification. In the 1990s, PepsiCo, a multinational corporation, began implementing contract farming in Punjab. Large farmers predominantly practice contract farming due to their more substantial bargaining power, better access to resources and ability to meet contracting firms' scale and quality standards. Contracting companies also prefer collaborating with fewer large farmers than numerous smaller ones, as this approach helps reduce transportation and extension service costs.

Findings from previous research highlighted several significant advantages of contract farming for farmers, including assured prices, guaranteed markets, better yields, higher incomes, technical guidance, crop diversification and employment generation. Twenty-nine papers out of a total of thirty papers in this review pointed out the potential benefits of contract farming for contract growers. Furthermore, twenty-two of thirty papers also noted some challenges farmers face while practicing contract farming, such as selection biases, payment delays, inadequate technical guidance, lack of credit and high production costs. Similarly, contracting firms encounter notable challenges, including farmer dishonesty, contract defaults, insufficient skilled labor, crop failures, mixing low-quality with high-quality crops and limited government support, as noted in nine papers. To increase farmer participation in contract farming and maximize benefits for both parties, it is recommended to establish a well-structured legal protection framework that equally safeguards both sides from financial risks. Additionally, increasing the involvement of both public and private entities is essential to reduce the oligopoly status of the few large-scale buyers in the state.

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