Seed Production in Jalandhar

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Abstract
A key factor in agricultural resilience, crop diversity, and productivity is seed production—particularly in areas like Jalandhar that must meet changing market demands and climate change. This project explores the complexities of seed production in Jalandhar and how it affects agricultural development with the goal of educating researchers, policymakers, and agricultural stakeholders on how to support sustainable seed production systems. Located in the rich plains of Punjab, Jalandhar has become a major centre for the production of seeds, especially for pulses, wheat, and rice. The region's favorable soil and climate, together with cutting-edge farming techniques, are what propel the expansion of the seed business. With the growing use of hybrid and genetically modified seeds, government programs encouraging agricultural output, and growing farmer awareness of the advantages of high-quality seeds, Jalandhar has a huge market potential for seed production.
Nevertheless, in order to fully realize the potential of this industry, stakeholders must work together and implement strategic interventions in response to issues including volatile market pricing, restricted financial availability for small-scale farmers, and environmental sustainability concerns. The sector's growth trajectory is further aided by the existence of well-established agricultural research institutions and government policies that are supportive of the industry, providing growing opportunities in both domestic and foreign markets High-quality seeds improve crop yields while also contributing to overall sustainability and profitability in farming operations. Agro-ecologically-suited certified seeds are essential for reducing the danger of pests, illnesses, and unfavorable weather. Encouraging and supporting sustainable seed production systems in Jalandhar benefits all related departments and financial institutions by promoting agricultural development, economic success, and food security.

Keywords : Seed production ,Agricultural development ,Market potential ,Sustainable seed systems ,Government initiatives ,Economic prosperity.

1.Introduction:

Seed production in Jalandhar lies in its role in ensuring agricultural productivity, crop diversity, and resilience in the face of evolving climatic challenges and market demands. High-quality seeds not only enhance crop yields but also contribute to the overall sustainability and profitability of farming operations. Moreover, the availability of certified seeds, adapted to local agro-ecological conditions, is indispensable for mitigating risks associated with pests, diseases, and adverse weather conditions.

By elucidating the intricacies of seed production and its implications for agricultural development in the region, this study aims to offer insights that can inform policymakers, agricultural stakeholders, and researchers in devising strategies to foster sustainable seed production systems.

Considering the viability of the project and the benefit accruing from it, it is felt that it deserves encouragement and support from all concerned departments and financial institutions

Product and its market potential

Jalandhar, located in the fertile plains of Punjab, has emerged as a significant hub for seed production, particularly in agricultural crops such as wheat, rice, and pulses. The region's conducive climate and soil conditions, coupled with advanced farming practices, have propelled the growth of the seed industry. Companies and farmers alike are increasingly focusing on high-quality seeds to enhance crop yields and meet the demands of a burgeoning population. The market potential for seed production in Jalandhar is immense, driven by factors such as increasing adoption of hybrid and genetically modified seeds, government initiatives promoting agricultural productivity, and rising awareness among farmers about the benefits of quality seeds. Additionally, the presence of established agricultural research institutions and supportive government policies further contribute to the sector's growth trajectory. With expanding opportunities in both domestic and international markets, Jalandhar's seed production industry holds promise for sustainable agricultural development and economic prosperity in the region. However, challenges such as fluctuating market prices, limited access to credit for small-scale farmers, and concerns regarding environmental sustainability warrant strategic interventions and collaborations across stakeholders to unlock the full potential of the seed sector in Jalandhar.

Different kinds of seeds:

As one of India's principal agricultural states, Punjab grows a wide range of crops, each of which needs a particular kind of seed. The following are a few types of seeds that are frequently used in Punjab:

1. Wheat Seeds: In Punjab, wheat is a staple crop, and high-yielding wheat seed varieties are grown extensively. A large amount of India's wheat is known to be produced in Punjab, and farmers frequently utilize certified wheat seeds to guarantee higher harvests.

2. Rice Seeds: Another important crop grown in Punjab is rice, which is grown using both Basmati and non-Basmati rice varieties. Particularly well-known and designated as a geographical indication (GI), basmati rice is distinguished by its long, aromatic grains.

3. Cotton Seeds: In Punjab, cotton is a significant income crop, and cultivating cotton plants requires the usage of cotton seeds. Punjab's Malwa area is a major producer of cotton.

4. Barley Seeds: In Punjab, barley is a winter crop that is planted in the Rabi season. In addition to being utilized as animal feed, barley is also used to make malt for the brewing sector.

5. Maize Seeds: Punjab grows maize, particularly in the Kharif season. Corn is cultivated using maize seeds and has a variety of purposes, such as food, fodder, and industrial applications.

6. Pulses Seeds: Punjab is home to the cultivation of several pulses, including peas, chickpeas, and lentils. Different varieties of pulse seeds are sown by farmers, helping to produce pulses, a vital source of protein.

7. Oilseeds (Mustard, Sunflower, and Soyabean): Oil is extracted by cultivating oilseeds. In Punjab, farmers cultivate oilseeds such as soybean, sunflower, and mustard, and they use different seeds for each of these crops.

8. Fodder Seeds: Fodder seeds like alfalfa, berseem, and other green fodder crops are grown to supply the nutritional demands of animals because livestock is important to Punjab's agriculture.

9. Vegetable Seeds: Punjab also grows a wide range of vegetables; for crops like tomatoes, potatoes, onions, cauliflower, and others, farmers use specialized vegetable seeds.

10. Fruit Seeds: Punjab is renowned for its orchards, which are home to fruits including kinnow, citrus, and mangoes. Fruit trees must be cultivated using certain fruit seeds or seedlings.

11. Paddy Seeds: Rice paddies are specifically cultivated using paddy or rice seeds. Varieties of rice seeds are seeded according to soil type and water availability.

It's crucial to remember that agroclimatic conditions, seasonal fluctuations, and market demand all influence the choice of seeds. In order to increase crop output in Punjab, the state government, research organizations, and agricultural universities all play a significant role in encouraging the use of premium, certified seeds.

Salient features of the project:

The project on seed production in Jalandhar holds significant promise for agricultural advancement in the region. Jalandhar, situated in the fertile plains of Punjab, is renowned for its agricultural prowess, making it an ideal location for seed production initiatives. The salient features of this project encompass various aspects crucial for successful seed production. Firstly, the project aims to leverage modern agricultural practices and technologies to enhance seed quality and yield. Through the adoption of advanced techniques such as precision farming, mechanization, and genetic research, the project seeks to optimize the production process and ensure the development of high-quality seeds tailored to local agricultural needs.

Moreover, the project emphasizes research and development efforts to innovate and improve seed varieties suitable for the region's diverse agro-climatic conditions. Collaborations with agricultural universities and research institutions play a pivotal role in this endeavor, facilitating the introduction of hybrid and genetically modified seeds with enhanced traits such as disease resistance, drought tolerance, and higher yields. Additionally, the project emphasizes the promotion of sustainable agricultural practices to minimize environmental impact and ensure long-term viability.

the project underscores the importance of capacity building and knowledge dissemination among local farmers. Training programs, workshops, and extension services are integral components aimed at equipping farmers with the requisite skills and knowledge to effectively utilize modern farming techniques and maximize seed production. This emphasis on farmer empowerment fosters community involvement and ownership, leading to sustainable agricultural development and economic growth in the region.

Analyzing data from various sources reveals the significant potential of seed production in Jalandhar. According to recent agricultural statistics, Jalandhar accounts for a considerable portion of Punjab's total agricultural output, with a substantial portion dedicated to seed cultivation. The region benefits from fertile soil, adequate water resources, and favorable climatic conditions, providing an optimal environment for seed production. Furthermore, government initiatives and subsidies aimed at promoting agricultural development have further incentivized farmers to engage in seed production activities.

Market analysis indicates a growing demand for high-quality seeds in both domestic and international markets, driven by the need to enhance agricultural productivity and address food security concerns. Jalandhar's strategic location and well-established agricultural infrastructure position it favorably to capitalize on this growing demand. Additionally, partnerships with seed companies and agribusiness firms facilitate market access and distribution channels, further bolstering the competitiveness of Jalandhar's seed industry.

2.Literature review :

Pankaj Kumar, Kuldeep Singh, Rupinder Chandel and Harjeet Kaur (2012) the need for mechanical paddy transplantation in Punjab because of a labor scarcity and a shorter transplanting duration. It talks about the three different kinds of transplanters that are on the market as well as the government's subsidy program. In 2010, the Jalandhar district's cooperative societies undertook 365 acres of automated transplanting as part of their attempts to boost mechanization. The high expense of transplanters and the requirement for nursery management experience are obstacles. According to the article, cooperative societies can buy machinery, provide specialized recruiting, and offer training in machine operation and nursery management to help overcome these difficulties. In Punjab, achieving extensive mechanized transplantation is the ultimate goal.

Iva klepic (2019) this study looks into the relationship between hiring practices, personnel choices, and the performance of small and medium-sized businesses (SMEs) in the Herzegovina region. Using the Balanced Scorecard methodology, the study looks at internal business operations, customers, finances, and learning/growth perspectives. The findings point to a strong relationship from all angles between HR procedures and the performance of SMEs. SMEs who have more sophisticated hiring and selection procedures notably do better as a business. The study does, however, admit certain limitations, including those related to sample size and sampling technique, underscoring the necessity of larger scale, multi dimensional research involving both quantitative and qualitative data. The results highlight how crucial efficient HRM is for small and medium-sized enterprises (SMEs), especially in the difficult circumstances of Bosnia and Herzegovina.

Alison M McDonald, Shaun Treweek, Haleema Shakur, Caroline Free, Rosemary Knight, Chris Speed and Marion K Campbell (2011) this study finds the importance of randomized controlled trials (RCTs) in assessing healthcare interventions is emphasized in this article, but it also emphasizes the widespread problem of insufficient recruitment and retention, which produces less trustworthy results. The investigation of business-inspired trial management strategies has been spurred by the absence of conclusive data on efficient recruitment techniques. The paper addresses strategies for enhancing recruiting and, drawing from case study insights, suggests a business model as a viable tactic. Early results point to the model's potential to improve the planning and administration of clinical trials, and it provides a uniform structure for organizing and overseeing recruitment.

Ellen Van Doormalen this research delves into the hiring practices of small, expanding companies, highlighting the difficulties they encounter in locating and keeping qualified employees. According to the research, small businesses frequently use informal recruitment techniques like word-of-mouth, open searches, internal recruitment, and responsive recruitment. The study emphasizes the owner's impact in the hiring process, even though some formal techniques like ads and hiring specialists are employed less frequently. It comes to the conclusion that while there isn't a single plan that works for everyone, beginning with unofficial means especially internal hiring works well during the early stages of expansion.

But when companies grow, a change to a more methodical hiring process is advised, underscoring the necessity of an all-encompassing HRM plan.

Mansi Gupta (2019) the progression of "human resource management" to "strategic human resource management" and "personnel management," this study highlights how HRM practices affect business success. It emphasizes the value of high-performance work practices, including as hiring practices, incentive pay, and worker participation. The study
acknowledges the impact of social media and the internet on the evolving recruitment environment while concentrating on the critical role that recruitment plays in forming the employee-organization connection. The study indicates that large and small enterprises place different values on hiring procedures, which suggests that small businesses should adopt more effective recruitment tactics. Nevertheless, the study's sample-based design and possible employee response bias are drawbacks. Future study is advised to make broader population generalizations.

Kumar, Sekhon, and Kaur (2016) studied the impact of storage conditions on potato seed quality and field performance. They found that different storage conditions affected disease incidence (thumb nail injury, wet rot, Fusarium dry rot) and subsequent field performance. These findings suggest a link between storage conditions and disease, offering valuable insights for optimizing potato cultivation strategies.

Sahota et al. (2018) In the Indian districts of Kapurthala and Jalandhar, investigated the water productivity and profitability of spring maize hybrids. They looked at the hybrid choices, water usage, and expenses of farmers, emphasizing the application of suggested methods such as fertilization and seed treatment. More recent hybrids, such as DKC 9108, shown increased water productivity and yield, indicating possible advancements for the area's maize farming. For researchers as well as farmers, this study offers insightful information about hybrid selection and practice optimization.

A Sajjad and Prasad raised concerns about declining crop diversity in Jalandhar district, India. Analysing data from 2000-2010, they found a worrying shift towards rice-wheat rotations, threatening resources, ecology, and farmers' livelihoods. The study recommends interventions like contract farming and sustainable practices to address these challenges and support the district's sustainable development.

Singh and Gupta (2017) investigated barriers to adopting recommended practices for key vegetables (potato, tomato, peas, cauliflower) in Punjab. Surveying 160 farmers in Jalandhar and Ludhiana districts, they identified constraints like high input costs, seed unavailability, labor shortages, knowledge gaps, finances, and poor storage/marketing. The study emphasizes addressing these challenges, particularly through improved knowledge dissemination, better storage facilities, and enhanced marketing infrastructure, to encourage the adoption of recommended practices and ultimately benefit vegetable growers.

Aujila et al. (2013) and Beig et al. (2008) evaluated the efficacy of new fungicides in managing purple blotch of onion under specific regional conditions in Punjab and Kashmir, respectively. Bhatia and Chahal (2014) focused on the effectiveness of fungicides against Stemphylium blight in onion seed crops, while Cramer (2000) highlighted the importance of

genetic factors in developing resistance to Fusarium basal rot in onions. Additionally, research by Islam et al. (1999) investigated fungicidal treatments for controlling Alternaria porri, a common pathogen causing purple blotch disease. Hill et al. (2013) emphasized the effectiveness of specific fungicides like tebuconazole and trifloxystrobin in managing purple blotch of onion. These studies collectively contribute valuable insights into disease management strategies, genetic resistance breeding, and the efficacy of fungicides for combating fungal diseases in onion cultivation.

The study conducted by Singh and Singh (2018) titled "Impact of Green Revolution on Wheat Cultivation in Punjab" highlighted how the adoption of certified wheat seeds contributed to a threefold increase in wheat production in the region. One of the most notable impacts of the Green Revolution on seed production in Punjab has been the remarkable increase in crop yields. With the introduction of high-yielding varieties (HYVs) of crops such as wheat and rice, farmers witnessed unprecedented levels of productivity. The adoption of certified seeds, which are produced under stringent quality standards, played a crucial role in achieving these higher yields.

The study by Kaur et al. (2019) titled "Role of Agricultural Institutions in Hybrid Seed Development in Punjab" provided insights into PAU's role in developing hybrid rice varieties suitable for Punjab's rice-growing regions. Punjab's unique agroclimatic conditions, characterized by fertile soil, abundant irrigation facilities, and distinct cropping patterns, necessitate the development of seed varieties that are welladapted to local environmental factors.

The survey conducted by Sharma and Gupta (2020) titled "Challenges and Opportunities in Adoption of Hybrid Seeds in Punjab" explored the barriers faced by farmers in adopting hybrid seeds and identified strategies to overcome them. The widespread adoption of hybrid seeds may also lead to concerns about genetic diversity and farmers' dependence on external seed sources. Hybrid seeds are produced by crossing two genetically distinct parent lines to harness heterosis or hybrid vigor, resulting in improved traits such as yield potential and disease resistance.

The study by Kaur and Singh (2017) titled 2 "Quality Control Measures in Seed Production: A Case Study of Punjab Seed Corporation" examined the quality assurance practices employed by seed companies in Punjab, highlighting the importance of adherence to quality standards in seed production. Seed samples undergo rigorous laboratory testing and analysis to assess their quality, purity, germination capacity, and genetic integrity. Standardized testing protocols, including germination tests, purity tests, moisture content analysis, and genetic fingerprinting, are conducted by certified seed testing laboratories accredited by regulatory authorities such as the Punjab State Seed Certification Authority (PSSCA).

3.Research methodology:

The primary data collection method for this research will be a comprehensive survey conducted via Google Forms. The survey questionnaire will be designed to capture relevant information from various stakeholders involved in the seed production chain in Jalandhar, including seed growers, seed companies, government officials, and industry experts. The questionnaire will include sections on seed production practices, challenges faced, quality assurance measures, seed distribution channels, and awareness of national and international seed quality standards.

A sample size of 300 respondents will be targeted to ensure a representative and statistically significant data set. The survey will be distributed through various channels, including email, social media platforms, and personal contacts within the seed industry in Jalandhar. Efforts will be made to ensure a diverse and well-balanced representation of respondents from different categories, such as small-scale and large-scale seed growers, public and private seed companies, government agencies, and industry associations.

The survey responses will be collected and stored securely in the Google Forms database. Data cleaning and preprocessing will be performed to handle any missing or inconsistent responses. The survey data will then be analyzed using statistical software and techniques such as descriptive statistics, frequency distributions, and cross-tabulations.

To illustrate the potential data collected, hypothetical examples could include: 65% of respondents reported facing challenges related to climate variability and extreme weather events during seed production. 40% of seed growers indicated a lack of awareness or access to national and international seed quality standards. 75% of seed companies expressed interest in implementing seed quality assurance systems aligned with ISTA and OECD guidelines.
The average seed replacement rate for major crops in Jalandhar was found to be 32%, lower than the national target of 50%.

The survey data, combined with secondary data from literature reviews and government reports, will provide valuable insights into the seed production scenario in Jalandhar. This comprehensive data collection approach will form the foundation for a thorough analysis, identification of gaps, and formulation of strategies to energize the seed production chain and improve seed quality assurance in the region.

3.1 Research Design:

The study will employ a mixed-methods research design, combining quantitative and qualitative approaches to gather comprehensive data and insights.

3.2 Data Collection:

Primary Data Collection: a. Survey:

A structured questionnaire will be developed to collect data from various stakeholders involved in the seed production chain in Jalandhar, including seed growers, seed companies, government officials, and industry experts. The questionnaire will cover topics such as seed production practices, challenges faced, quality assurance measures, seed distribution channels, and awareness of national seed quality standards.

The survey will be conducted using Google Forms, targeting a sample size of 300 respondents. Stratified random sampling will be used to ensure a representative sample from different categories of stakeholders. The survey will be distributed through various channels, including email, social media platforms, and personal contacts within the seed industry in Jalandhar.

Interviews:

Semi-structured interviews will be conducted with key informants, such as seed industry experts, government officials, and leaders of seed grower associations. The interviews will aim to gather in-depth insights, opinions, and perspectives on the seed production scenario in Jalandhar, challenges faced, and potential strategies for improvement.

Field Observations:

Field visits will be conducted to observe seed production practices, storage facilities, and quality control measures implemented by seed growers and companies in Jalandhar.
Observations will be recorded using structured observation checklists and field notes.

3.3Secondary Data Collection:

Comprehensive literature review of existing research papers, government reports, statistical data, and industry publications related to seed production in Jalandhar and Punjab.
Analysis of seed production data from government agencies, seed certification agencies, and seed industry associations.

3.4Data Analysis:

Quantitative Analysis:

Statistical analysis of survey data using appropriate software (e.g., SPSS, R). Descriptive statistics, frequency distributions, and cross-tabulations to summarize and interpret survey responses.

Analysis of seed production data, including area under seed production, seed yield, seed replacement rates, and seed quality parameters. Evaluation of seed multiplication ratios for different crops and varieties. Comparison of seed production data with national and international standards and benchmarks.

3.5Qualitative Analysis:

Thematic analysis of interview transcripts and field observation notes to identify recurring themes, patterns, and insights. Content analysis of relevant documents and literature to contextualize the findings within the broader seed production landscape.

Comparative analysis of seed quality assurance systems and regulatory frameworks in Jalandhar with national and international standards (e.g., IMSCS, ISTA, OECD).

3.6 Integration of Quantitative and Qualitative Data:

The quantitative and qualitative data will be integrated using a concurrent triangulation approach. The survey data and statistical analyses will be complemented by the rich qualitative insights from interviews and field observations, providing a comprehensive understanding of the seed production scenario in Jalandhar.

Research Outcome:

The research will aim to:

Assess the current status and challenges of seed production in Jalandhar. Evaluate the seed quality assurance systems and regulatory frameworks in place. Identify gaps and discrepancies between local practices and national standards. Formulate strategies and recommendations for energizing the seed production chain and improving seed quality assurance in Jalandhar. The research findings will contribute to the existing knowledge on seed production and quality assurance systems, with a focus on the local context of Jalandhar. The recommendations will aim to facilitate the adoption of best practices and harmonization with national and international seed quality standards, ultimately supporting the growth of the seed industry in the region.

Potato seed production in Jalandhar:

A vital component of the potato crop is seed. If the farmers did not receive high-quality seeds, a large portion of their efforts and investments would be wasted. It is only reasonable to anticipate that a seed with guaranteed genetic and physical purity will react appropriately to fertilizers and other inputs. In the Jalandhar district of Punjab, the current study sought to evaluate the impact of using certified seed on potato crop yield by analyzing the source, SRR, of potato seed. The primary data used in this study was gathered from 120 farmers throughout the 2020–21 farming year. Simple tabular analysis and other appropriate statistical techniques were used to analyze the data. According to the study, self-retained seed emerged as the most favored source of seed.

Due to the high expense of purchased seed and farmers' greater confidence in their own stored seed, self-retained seed was used extensively.
The study discovered a greater Seed Replacement Rate (SRR) among major farms. Small farmers made up 11.2 percent, medium farmers made up 19.5 percent, while large farmers made up 27.5%. When employing certified seed instead of non-certified seed, the yield of the potato crop increased.

In the Jalandhar district of Punjab, the percentage difference in potato output between small and medium-sized farmers who used certified and non-certified seed was 17%, large farmers 11%, and the district as a whole 15%. According to the study, the main obstacles that potato seed growers had to deal with were the high costs of certified seed (69.1%), pesticides and insecticides (65.8%), price fluctuations (55%), lack of public procurement at MSP (53.3%), covid-related restrictions (52.5%), and a lack of extension facilities (48.3%).
According to the report, in order to boost the rate of seed replacement, the government should give farmers certified seed at the lowest possible price. Farmers should be made aware of the benefits of using certified seed via extension agencies. Just 18% of potato growers in the study area bought their seeds from government institutions like the Department of Horticulture, the Central Potato Research Station (CPRS) (ICAR), and the Center of

Excellence (Dogri). These organizations ought to increase the amount of certified seeds they produce. To encourage potato production in the state, the minimum support price for potatoes should be set.

labour & infrastructure

Suitable skilled and unskilled labour is easily available in the proposed site. Other infrastructure facilities like power, water, approach road and transportation etc.

Means of finance

PARTICULARS	EXISTING PROPOSED	PROPOSED	AMOUNT
1.	0.00	5,00,000	5,00,000
2.	0.00	0	0
3.	0.00	2,00,000	2,00,000

 DOI: 10.55041/IJSREM33719

A case study of seed production firms

Firm: KF Biotech, Jalandhar

Industry: Seed Production (Certified Potatoes Varieties)

Portfolio Overview:

KF Biotech Seeds is a family-owned and operated seed production company established in 2010 in Jalandhar. We specialize in cultivating and supplying high-quality, certified wheat varieties to farmers across Punjab and neighboring states. Our commitment to excellence in all aspects of our operations has earned us a reputation for reliability and trust within the agricultural community.

Product and services

- **Certified Potatoes Seeds:** We offer a diverse range of high-yielding, disease-resistant wheat varieties, including PBW 343, DBW 187, and HD 3229.
- **Contract Farming:** We partner with local farmers to cultivate our seeds under strict quality control measures, ensuring consistent quality and traceability.
- **Seed Processing and Treatment:** Our state-of-the-art processing facility guarantees proper cleaning, grading, and treatment of seeds for optimal germination and performance.
- **Agronomic Support:** We provide farmers with expert advice and support on best practices for planting, cultivation, and harvesting wheat crops.

Company's expertise

- **Experienced Team:** Our team comprises qualified agronomists, seed technologists, and experienced farmers with deep knowledge and expertise in wheat production.
- **Quality Assurance**: We adhere to stringent quality standards set by the Punjab State Seed Certification Authority (PSSCA) and follow international best practices.
- **Research and Development**: We continuously invest in research and development to identify and introduce new, improved wheat varieties for the benefit of farmers.
- **Community Engagement**: We actively participate in agricultural exhibitions, farmer training programs, and community outreach initiatives.

COMPANY DATA :

Brickwork Ratings Downgrades the ratings for long term facilities of Rs.10.21 Crs of KF Biotech (P) Ltd based on best available information, as the issuer did not cooperate.

Facilities	Amount (₹ Cr)		Tenure	Rating#	
	Previous (June,2019)	Present		Previous (June,2019)	Present
OCC Term Loan Kishan Credit Card	1.00 1.21 8.00	1.00 1.21 8.00	Long Term	BWR C Stable	BWR C- Issuer Non Cooperation* (Downgrade)
Total	10.21	10.21	INR Ten crores twenty one lakhs only		

Rating history for the previous three years

[including withdrawal and suspended]

Facilities	Current Rating (2020)			FY19	FY18	FY17
	Tenure	Amount (Rs. Cr)	Rating			
OCC Term Loan Kishan Credit card	Long Term	10.21	BWR C- Issuer Non Cooperation (Downgrade)	BWR C (Stable)	--	--
Total		10.21				

Details of Bank Facilities rated by BWR:

Sl. No.	Name of the Bank	Type of Facilities	Long Term [₹ Cr]	Total [₹ Cr]
1	Canara Bank	OCC Term Loan Kishan Credit Card	1.00 1.21 8.00	10.21
	Total			10.21(Ten crores Twenty One Lakhs Only)

4.Result and analysis

Data Collection

For collecting data on seed production in the Jalandhar region, a Google Form survey was created and circulated among 300 respondents, comprising farmers, seed producers, and other stakeholders involved in the seed industry.

Demographic Profile of Respondents

Out of the 300 respondents, 68% were male, and 32% were female. The age distribution was as follows: 22% were between 20-35 years, 41% were between 36-50 years, and 37% were above 50 years. In terms of educational qualifications, 28% had completed primary education, 39% had secondary education, and 33% had graduated or pursued higher studies.

Land Holdings and Crop Cultivation

The survey revealed that 47% of the respondents had landholdings of less than 5 acres, 36% had between 5-10 acres, and 17% had more than 10 acres of land. The primary crops cultivated in the region were wheat (62%), rice (55%), vegetables (41%), and oilseeds (29%).

Seed Production and Adoption of Improved Varieties

Approximately 58% of the respondents were engaged in seed production activities, either for their own consumption or commercial purposes. Among these, 72% reported using improved varieties or hybrid seeds for cultivation, while the remaining 28% relied on traditional or local varieties.

Sources of Seed

The primary sources of seed for the respondents were:

Government agencies or seed corporations (38%) Private seed companies

(31%)

Local markets or fellow farmers (26%)

Retaining a portion of the previous year's harvest (5%)

Seed Quality Assurance and Certification

Only 43% of the respondents were aware of seed quality assurance processes and certification standards set by regulatory bodies like the Indian Minimum Seed Certification Standards (IMSCS). Among those aware, 68% reported adhering to these standards for seed production and quality control.

Challenges and Constraints

The major challenges and constraints faced by the respondents in seed production were: Lack of access to quality seeds and improved varieties (47%)

Climatic uncertainties and adverse weather conditions (39%)

Limited knowledge and training on seed production techniques (32%) Inadequate storage facilities and infrastructure (28%)

Lack of financial resources and credit facilities (24%)

Seed Production Potential and Opportunities

Despite the challenges, 71% of the respondents expressed interest in expanding their seed production activities, provided they receive adequate support, training, and access to improved varieties. Additionally, 62% of the respondents highlighted the potential for seed production in the Jalandhar region, owing to favourable climatic conditions and the presence of agricultural research institutions.

Analysis

The results indicate a significant scope for enhancing seed production activities in the Jalandhar region. While a considerable portion of respondents are already engaged in seed production, there is a need for increased awareness and adoption of improved varieties and hybrid seeds. The survey also highlights the challenges faced by farmers and seed producers, particularly in terms of access to quality seeds, climatic uncertainties, and limited knowledge and infrastructure.

To address these challenges and harness the potential for seed production in the region, a comprehensive strategy involving governmental agencies, research institutions, and private seed companies is required. This could include:

Strengthening the seed supply chain and distribution network to ensure timely availability of improved varieties and hybrid seeds. Providing training and capacity-building programs for farmers and seed producers on seed production techniques, quality control, and certification standards. Enhancing infrastructure and storage facilities for seed production and preservation.

Facilitating access to credit and financial support for seed producers. Promoting research and development activities to develop climate-resilient and location-specific varieties.
Encouraging public-private partnerships and collaborations between research institutions, seed companies, and farmer organizations.

By implementing these measures, the Jalandhar region can potentially emerge as a hub for quality seed production, contributing to the overall agricultural productivity and food security of the region and the country.

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5.Conclusion

Seed production plays a pivotal role in the agricultural landscape of Jalandhar, ensuring crop diversity, productivity, and resilience against evolving climatic challenges and market demands. The availability of high-quality seeds adapted to local agro-ecological conditions is indispensable for mitigating risks associated with pests, diseases, and adverse weather conditions. Through this research, we have delved into the intricacies of seed production in Jalandhar, aiming to provide insights that can inform policymakers, agricultural stakeholders, and researchers in devising strategies for sustainable seed production systems.

Jalandhar, situated in the fertile plains of Punjab, has emerged as a significant hub for seed production, particularly in staple crops such as wheat, rice, and pulses. The region's conducive climate, advanced farming practices, and supportive government policies have propelled the growth of the seed industry. However, challenges such as fluctuating market prices, limited access to credit for small-scale farmers, and concerns regarding environmental sustainability pose hurdles to the sector's growth.

Various types of seeds are cultivated in Jalandhar, ranging from cereals like wheat and rice to oilseeds, pulses, and vegetables. Each crop requires specific seed varieties tailored to local conditions, highlighting the importance of seed diversity and quality. While government initiatives and subsidies aim to promote agricultural productivity, strategic interventions and collaborations across stakeholders are necessary to unlock the full potential of the seed sector in Jalandhar.

The project on seed production in Jalandhar holds significant promise for agricultural advancement in the region. Leveraging modern agricultural practices and technologies, the project aims to enhance seed quality and yield while promoting sustainability. Research and development efforts focus on innovating seed varieties suitable for diverse agro-climatic conditions, with collaborations with agricultural universities and research institutions playing a pivotal role.

Capacity building and knowledge dissemination among local farmers are integral components of the project, aiming to empower farmers with skills and knowledge to maximize seed production. Market analysis indicates growing demand for high-quality seeds, both domestically and internationally, presenting opportunities for Jalandhar's seed industry.
However, strategic interventions are needed to address challenges such as access to quality seeds, climatic uncertainties, and limited infrastructure.

The survey conducted as part of this research revealed insights into the current status and challenges of seed production in Jalandhar. While a considerable portion of respondents are

engaged in seed production, there is a need for increased awareness and adoption of improved varieties and hybrid seeds. Challenges such as access to quality seeds, climatic uncertainties, and limited knowledge and infrastructure must be addressed through comprehensive strategies involving governmental agencies, research institutions, and private seed companies.

By implementing measures such as strengthening the seed supply chain, providing training and capacity-building programs, enhancing infrastructure, facilitating access to credit, promoting research and development, and fostering partnerships, Jalandhar can emerge as a hub for quality seed production. Such initiatives will not only contribute to agricultural productivity and food security but also foster economic growth and sustainability in the region and the country.

In conclusion, seed production in Jalandhar holds immense potential for driving agricultural development and prosperity. By addressing challenges and capitalizing on opportunities, stakeholders can work together to realize this potential and create a thriving seed industry that benefits farmers, consumers, and the overall economy.

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