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Farmers' Perceptions regarding Production and Marketing of Quality Seed in Madhya Pradesh

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AGRO- ECONOMIC RESEARCH CENTRE
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PREFACE

*The present study entitled "**Farmers' Perceptions regarding Production and Marketing of Quality Seed in Madhya Pradesh**" has been assigned by the Directorate of Economics and Statistics Ministry of Agriculture Government of India to this centre in the year 2021-22.*

The study comprises 120 selected quality seed producers of Wheat, Gram and Soybean of Hoshangabad, Dewas and Ujjain Districts, respectively. The study revealed that the quality seed producer were found to preferred production of seed over grain as they obtained more than an additional Rs. 1.00 income over the additional investment of Rs. 1.00, which was found to be more in wheat (Rs.8.81) as compared to gram (Rs 1.17) and soybean (Rs.1.51). The quality seed production of wheat was found to be more profitable as compared to gram and soybean as quality seed producers obtained maximum return per Rs. Investment in case of wheat (3.19) as compared to gram (2.03) and soybean (1.22).

On behalf of the Centre, I express deep sense of gratitude to Prof. P.K.Bisen, Hon'ble Vice-Chancellor and Chairman, Advisory Body of AERC, Jabalpur, Dr. (Smt). Pramodita Satish, Adviser, AER Division, Ministry of Agriculture and Farmers' Welfare, Govt. of India, New Delhi, Dr. D. Khare, Dean, Faculty of Agriculture, Dr. G.K.Kottu, Director Research Services, Dr. D.K. Shukla, Director Extension Services and Dr. Sharad Tiwari, Dean, College of Agriculture, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur for providing the valuable guidance and all facilities during various stages in successful completion of this study of high importance.

The present study was conducted by Dr. H. O. Sharma, Dr. Deepak Rathi and Dr. H. K. Niranjan of this centre. The field investigation, tabulation, analysis, interpretation and drafting of the report were performed by them. I wish to express my deep sense of gratitude to team members namely; Dr. R. P. Pandey, Mr. S. S. Thakur, Mr. R. S. Bareliya, Mr. P. K. Patidar & Mr. Akhilesh Kuril for their untiring efforts in bringing this innovative study to its perfect shape.

I express sincere thanks to all the seed societies chairman/directors of Hoshangabad, Dewas and Ujjain districts respectively and their a member of staff for providing not only secondary data but also extending great assistance in collection of primary data from the seed producer members.

I hope the findings and suggestions made in the study would be useful to policy makers of the State and Govt. of India.

Date : 11.04.2022 **(Hari Om Sharma)**
Place: Jabalpur **Prof. & Director**

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* GSP=Grain Seed Production and QSP= Quality Seed Production

EXECUTIVE SUMMARY

Seed is the most basic, critical and vital input for the sustainable growth in agricultural production. It is estimated that the direct contribution of quality seed alone to the total production is about 15-20% depending upon the crop and it can be further raised up to 45% with efficient management of other inputs. Every farmer should able to access healthy seeds which are genetically pure, with high seed vigour and good germination percentage. Timely availability of good quality seeds at reasonable price ensures good yield and profit to the farmers. The seeds plays a vital role in agriculture and acts as a carrier of the genetic potential of varieties. Quality seed production which follows efficient certification procedures plays a major role in the increase of food production of our country. The national seed requirement is taken care of through formal seed system (FSS) and informal seed system (ISS). Formal seed system is characterized by large scale production of seed of officially released varieties with strict quality assurance mechanism. This system is well organized and systematic, usually starts with development of different types of varieties/hybrids. The principles in the FSS are to maintain varietal identity, purity and to produce seed of optimal physical, physiological and sanitary quality (Reddy et al. 2007). Formal seed system is managed by Government body (Government Institutions, State Government Farms, University farms & KVKs) and registered seed growers (NGOs, Private Companies) whereas ISS is managed by farmers and sometimes private seed growers.

The M.P. Seed certification agency issues tags on the seeds which met the standards of seed certification prescribed in the Indian Minimum Seeds Certification Standards. These tags are stitched on the gunny bags of Standard sizes in which seeds are packed. The standard sizes of packing are 30 kgs, 40 kgs, 100 kgs etc. The gunny bags are procured from private institutions, through tendering process. The lot number, variety stage etc details are printed on the bags & tags are stiched. The final tagged & bagged seed is distributed to the farmers of M.P. at a rate which is decided by the State Government. The seeds are distributed through various cooperative societies and centres of MP Rajya Beej Evam Farm Vikash Nigam like LAMPS, PACS, Co-operative societies, DMO, DDAs, Cash Sale etc. Similarly, seed storage is

needed to store the seed during the period from receipt of seed at the plant till it is supplied to the dealer / farmer for sale. In the past three years Nigam has undertaken massive infrastructure development especially in storage facilities like building new godowns. The Nigam produces about 3 lakh quintals of Foundation & Certified seeds in two season i.e. Kharif & Rabi. The Beej Nigam has 54 processing centers located at different district across the State. Seed processing plants are equipped with new grading machines needed for successful cleaning & grading operations.

Objectives of the Study

1. To analyze organizational and functional structure of Seed Societies and its effectiveness in operations and governance.
2. To analyze profitability of seed production over grain production of selected crops.
3. To analyze farmers perception of quality seed production and identify various constraints related to efficient production and marketing of quality seed production.

Hoshangabad, Dewas and Ujjain district have been selected purposively as per maximum seed distributed under wheat, gram and soybean through MP Rajya Beej Evam Farm Vikash Nigam respectively across district of Madhya Pradesh. A list of all the seed distribution societies in the selected districts was prepared and top two seed distribute on societies in each district were selected for collection of data. Further, a list of producer members of each selected seed society was prepared and a sample of 20 beneficiaries from each society was selected randomly through proportionate random sampling method. Thus, the total size of sample constitute 20x2 (in each society) x3 (selected districts) =120 respondents of Madhya Pradesh. The secondary data were collected from the website of http://mpssfdc.mp.gov.in of MP Rajya Beej Evam Farm Vikash Nigam, Bhopal and selected seed distribution societies located at different selected district of Madhya Pradesh.The Likert scale (1932) was used to analyse the data. It provides five possible answers to a statement or question that allows respondents to indicate their positive-to-negative strength of agreement or strength of feeling regarding the question or statement. A type of psychometric response scale in which responders specify their level of

agreement to a statement typically in five points: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree.

Conclusions

The following conclusions emerged from the finding of the study:-

- The majority of Quality Seed Producers (QSPs) were found to be educated above high school (92.5%) belongs to general and OBC caste categories (97.5%) and all of them involved in primary as well as secondary occupation. Half of the family members were found to be engaged in farming.
- The total land of QSPs was found to be under cultivation out of which more than 75 per cent was under irrigation with cropping intensity of approximately 200 per cent with higher being of in case of QSPs of wheat (246.88%) followed by gram (200.00%) and soybean 193.00%)
- The breeder and foundation seed of wheat, gram and soybean were found to be distributed to quality seed producers by SPCSs. (i) GW 322, GW 451, HI 1634 and Tejas HI 8759 of latest developed varieties of wheat was found to be distributed to 52.5, 40, 2.5 & 15 per cent of producer members by the SPCSs. An average producer of wheat was found to consume 17.55, 12.35, 2.00 & 5.83 kg breeder seed of these varieties, respectively for cultivation of quality seed production of wheat at his farm. (ii) RVG 202 was found to be a latest developed variety of gram distributed amongst all the gram growers by the SPCSs for production of quality seed of gram in the area under study. An average gram producer was found to consume 3.42 kg breeder seed of RVG 202 in his farm. (iii) In case of soybean breeder seed of RVS 104, JS-20-29 & JS-95-60 as well as foundation seed of JS-95-60, RVS-2011-04, JS-20-34 & JS-93-05 of latest developed varieties were found to be distributed amongst the producer members. The 2.5 per cent of breeder seed of each variety was found to be distributed among the producer members for quality seed production of soybean. As regards to foundation seed, the maximum seed was found to be distributed of variety JS-95-60 (70%) followed by JS-20-34 (12.5%), RVS-2011-04 (10%) & JS-93-05 (5%) by the

SPCSs. The quantity of these varieties distributed to seed producer was found to be raged between 1.20 (JS-20-29) to 6.83 (RVS-2011-04) kg per soybean seed producer.

- The cultivation of quality seed production was found to be profitable business over grain production as quality seed producers obtained more than Rs. 1.00 income over the additional investment of Rs. 1.00, which was found to be more in case of wheat (Rs.8.81) as compared to soybean (Rs.1.51) and gram (Rs 1.17). Although, the cost incurred in seed, labour (human & machine) and plant protection chemicals was found to be more in quality seed production as compared to grain as the quality seed production is costly affair as the purity and vigour is require to be maintained by the producers.
- The cultivation of quality seed production of wheat was found to be more profitable as compared to gram and soybean as quality seed producers obtained maximum per Rs. Return over the investment of Rs. 1.00. which was found more in case of wheat (3.19) as compared to gram (2.03) and soybean (1.22).
- The cost of production in quality seed production was found to be more in case of seed as compared to grain by 50.62, 17.43 and 22.22 per cent in case of wheat, gram and soybean, respectively.
- The majority of quality seed producers use to adopt all the advance technologies viz. timely sowing (>80%), line sowing (>90%), maintained plant geometry (row to row-plant to plant distance and depth of sowing) (>75%), seed treatment and fungicide (>87.5%) and rouging & weeding (>72.5%) in cultivation of wheat, gram and soybean.
- The majority of quality seed producers also used to maintain moisture contain at the time of harvesting and storage (>70%), while isolation distance, testing of seed germination were found to be adopted by more than 40 and 22 per cent quality seed producers, respectively. The seed lot of more than 93 per cent quality seed producers was never found to be rejected by the Seed Certification Agency.
- The supervision is being carried out by the elected members of SPCSs and seed certification officers at sowing, flowering, maturity and harvesting stage of the crops. The majority of quality seed producer reported that supervision was done very

frequently at the time of flowering and maturity as compared to sowing and harvesting stage of cultivation of crops.

- The more than 90 per cent respondents strongly aggree with opinion that the cultivate the quality seed over the grain as it provides high price, high yield, easily availability of seed of latest improoved varieties for the current and next year, easily availability of critical inputs as per requirement from the SPCSs, seed of latest improoved varities at the time of sowing at free of cost, ease in marketing of produce, latest technological knowledge of the crops for which seed programme is taken as well as other crops is easily accessable and payment of produce on time by the SPCSs. Apart from this the majority of respondents also reported that thay can also have an additional benefits along with the seed programme such as soil health is maintained, technological knowlwdge of growing of different crops is gained drudgery is reduced with the help of various machine and equipment provided by the societies.
- The majority of the respondents reported that unavailability of seed testing report on time i.e. before sowing (100%), insufficient quantity of seed as per requirement (98%), unavailability of desired type (Breeder/Foundation) of improved HYVs of seeds (95%), unavailability of desired improved HYVs (92%), unavailability of subsidy for quality seed production (87%), refusal of undersize seed and return to producers after selling to the SPCSs (78%), low germination as reported in the bag (77%), unavailability of skilled labours at the time of peak operational periods (75%), lack of awareness of isolation distance maintained for quality seed production (71%) and mechanical impurity existed in production of quality seed (65%).
- Lack of coordination between SPCSs and state seed supply institutions (83%), unavailability of subsidy for quality seed production from last 3 years (83%), complicated process for formation of society (more documentation, renewal of society every year, time consuming etc.) (67%), boundation of sale of seed with in the district (67%), breach of promise by Agricultural Department on holding of seed in the society (67%), delay in payment of seed procured by Department of Agriculture (67%), breach of promise by Primary Agriculture Marketing Society on used to

return quality seed to SPCSs, if not sold by them (50%) and if market price is more than procurement price, producers bound to sold the quality seed in open market (33%) were found to be the major constraints faced by the SPCSs in procurement and marketing of quality seed production.

Policy Prescription

Looking to the conclusions of the study, it seems that there is lack of coordination between seed producing institutions (SAU, KVK, ZARS, RARS, Agricultural Department farms etc) and SPCSs due to which the desired type of seed (Breeder, Foundation and Certified) and HYVs of crops are not available in sufficient quantity as per requirement of the member farmers. At the same time very precious input i.e. seed was found to be sold in the open market as the price of different type of seed are not fixed by the State Government. Some time when the price of grain was more than the market price of seed, it was found that the producer sold out seed as a grain in the open market. Inspite of investing in research for the good cultivars, it is not being distributed amongst the farmers those who are in need. The distribution efficiency is also found to be lacking and technology is not being penetrate vertically as well as horizontally due to which the diffusion of technology lagging behind without exploiting its fullest potential level.

Therefore, it become imperative to bring radical changes for bringing harmony in production, procurement and distribution of quality seed across all the stake holders with ensuring proper diffusion of technology at minimum possible time. The policy initiative which are emerge from the conclusions of the study are as follow:-

I. The web portal on production, procurement and distribution of seed involving all the stakeholders is required to be launched in the State, which covers all the informations of seed, varieties, quantity available, sources, price, type and availability of seeds along with ensuring door step delivery.

II. It was found during the investigation that at the time of procurement the price of different type of seeds (Foundation-I, Foundation-II, Certified-I, Certified –II etc) of different varieties of crops remain almost same. There is no discrimination across

various types of seed. Hence, it is required to fix price of different type of seed by the State Government before sowing of the crops.

III. Looking to the breach of promises by the Department of Agriculture and Primary Agriculture Marketing Society with SPCSs there is a problem in distribution of seed. Therefore some legal framework should require to be developed to ensure existence of these societies for the development of agriculture and farming communities.

IV. Although subsidy was found to be provided for production of quality seed but not available in time hence, the subsidy on quality seed to the farmer as well as SPCS should be ensured at the time of procurement with signing legal documents between the Societies and Department of Agriculture.

V. It is also found during the observation that the seed quality testing is performed by two agencies i. e. i-Seed certification agencies and ii-Department of Agriculture. However, seed quality testing report from the Department of Agriculture is generally made available after sowing of the crops which create hindrance in the quality seed production. Therefore, the report of seed quality testing should be made available before sowing of crops.

VI. The seed are very precious input which require on continuous basis. Therefore the payment of seed procured by the Agriculture Department from the SPCSs is required to be done on priority basis in time.

VII. The credit should be made available at low rate of interest for creation of infrastructure facilities (Grading, Packaging, Warehousing etc.) and to strengthen the SPCSs for their long term viability.

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CHAPTER-I

INTRODUCTION

1.1 Background

Seed is the first input of agricultural production on which the performance and efficacy of other inputs depend. Good quality of seeds can contribute upto 30% increase in productivity (Hasanuzzaman2015). "Good seed harvests good crop", a good seed means a seed lot that adheres to all the parameters of minimum seed standard; this seed is generally termed as quality seed. A good quality seed should be pure, full and uniform in size, free from weeds, insect, disease and other inert matters and more over it should be viable (>80% germination). Timely availability of good quality seed as per the requirement plays a major role in the higher grain production of a nation. In India, 75% small and marginal farmers are lagging behind in agriculture due to unavailability of resources or inputs including seed. Therefore, a strong and vibrant seed production and supply system is indispensable for food security of the country and accelerating growth in agriculture. Seed is the highest prioritized input in agriculture, on which agriculture sustains. Over past 70 years, improvement in seed system was targeted to secure the seed quality, accessibility and availability.

Seed is the most basic, critical and vital input for the sustainable growth in agricultural production. It is estimated that the direct contribution of quality seed alone to the total production is about 15-20% depending upon the crop and it can be further raised up to 45% with efficient management of other inputs. Every farmer should able to access healthy seeds which are genetically pure, with high seed vigour and good germination percentage. Timely availability of good quality seeds at reasonable price ensures good yield and profit to the farmers. The seeds plays a vital role in agriculture and acts as a carrier of the genetic potential of varieties. Quality seed production which follows efficient certification procedures plays a major role in the increase of food production of our country.

In the current scenario, the demand for good quality certified seeds far exceed the availability in the market. Seed Sector in India is of two types namely formal and informal.

Informal sector is the one where farmers produce seeds without following certification procedures and exchange it amongst themselves. The formal type of seed sector follows seed certification procedures and standards to produce a particular variety of seed.

The important development relating to seed sector in the country are highlighted below in the table 1.1

Table 1. 1: Important development related to seed sector in the India

Year	Event	Objective/s
1952	A standing experts committee on seeds was appointed by Indian Council of Agricultural Research (ICAR).	The committee formulated a programme structure to strengthen the seed production & distribution system under, which Central Govt. provided financial assistance to the states.
1956-57	State Seed Farm Project was initiated	Different states started producing foundation seeds in State Seed Farms.
1957-1965	All-India Coordinated Project for maize, wheat, pearl millets and barley	This involved production of foundation and certified seeds.
1959	An agricultural production team, by Dr. Johnson was formed	To bring uniform standards of seed certification, seed laws and establishment of Seed Testing Lab for each State.
	Planning Commission appointed a Seed Multiplication Team	To review the various aspects of seed programmes
1960	ICAR set up a Committee	To suggest ways for developing a strong seed production programme. The Committee recommended for establishment of Central & State agencies for the production of foundation seed and an independent seed certification agencies to safe-guard the quality seed. The same committee also recommended for enactment of National Seed Act and formation of agencies for enforcement of seed act.
1963	ICAR constituted a committee	National Seeds Corporation was established and Indian Seed Act was enacted in 1966
1964	A rapid varietal release systems for improved variety	The State Variety Release Committees (SVRC) was established

Indian Seed Industry is one of the biggest seed market in the world and it involves various institutions and organizations like Government institutions, Public sector

organizations, Research and academic laboratories and Institutions and Private Sector. Ministry of Agriculture and the Department of Seed Certification, Indian Council of Agricultural Research (ICAR), State Agricultural Universities (SAU), National Seeds Corporation (NSC), State Farm Corporation of India (SFCI), 15 State Seed Corporations (SSCs), 22 State Seed Certification Centers and 104 notified Seed Testing Laboratories are major players in the seed industry. Nearly 150 large private seed companies nationwide are involved in seed production.

In 1966-67 the seed production programme for wheat and maize was started and after a year (1967-68) rice crop was also included. After a huge review and recommendation, on 2nd October 1969 Indian Seed Act has been in force in India. Indian Seed Act, 1966 is an act to provide measures for regulating the quality of certain seeds for sale and for matters connected therewith. Some highlights of this act are (i) constitution of Central Seed Committee by Govt. of India to advice Central and State Governments regarding the Act., (ii) establishment of Central Seed Laboratory, (iii) establishment of State Seed Lab for seed quality analysis, (iv) provision of notification of varieties by Govt. of India, (v) minimum limits of germination and purity of seeds and compulsory label fixing, (vi) notified seed standard fixed, (vii) identifiable as seed of the variety it claims, (viii) must have minimum prescribed purity & germination, (ix) seed container must bear labels containing correct particulars of the seed, (x) establishment of Seed Certification Agency, (xi) establishment of Central Seed Certification Board to advise the Govt. of India and State Govt. on all matters relating to certification, (xii) appointment of Seed Analyst for seed analysis in State Seed Laboratory, (xiii) appointment of Seed Inspector to collect seed samples of notified kind being offered and (xiv) forfeiture of property (seeds) belonging to any person convicted under this act due to contravention of the procedures under this act. Further, first turning point in shaping an organized seed industry was through National Seed Project (NSP) Phase-I (1977-78) which initiated the establishment of State Farms Corporation of India (SFCI), 4 State Seeds Development Corporations (SSDCs) and Breeder Seed Production (BSP) units. In the Phase-II of NSP (1985)13 additional SSDCs and 19 state seed certification agencies were established for quality seed production. After 10 years (1988-89) a New Seed Development

Policy was formulated which gave access to the private individuals with strong R&D base for product development.

To achieve the food grain demand in future, it was felt that the Seed Replacement Rate (SRR) of various crops needs to be enhanced. This would require a major increase in the production of quality seeds with the involvement of both public and private sector. To safeguard the interests of Indian farmers and agro-biodiversity conservation, and to guard the exploitation of farmers by unscrupulous elements, the National Seed Policy (2002), a regulatory system, was formed. Later for regulating the production, distribution, quality of seeds for sale, import, export and to facilitate production and supply of seeds of quality and for matters connected therewith or incidental thereto, a seed bill (2004) was proposed. The government has proposed new amendments to the bill in April 2010 and November 2010, accepting most of the recommendations given by the Standing Committee. Few highlights of the Seed Bill (2004) are (i) all varieties of seeds for sale have to be registered, (ii) the seeds are required to meet minimum standards, (iii) transgenic varieties only be registered after clearance certificate as per the Environment (Protection) Act, 1986, (iv) exemption of farmers from the requirement of compulsory registration (v) farmers are allowed to sow, exchange or sell their own seed and planting material without any formalities required by registered seeds but, farmers cannot sell seed under a brand name, and (vi) provision for claim of compensation in case a registered variety of seed fails to perform to expected standards.

The national seed requirement is taken care of through formal seed system (FSS) and informal seed system (ISS). Formal seed system is characterized by large scale production of seed of officially released varieties with strict quality assurance mechanism. This system is well organized and systematic, usually starts with development of different types of varieties/hybrids. The principles in the FSS are to maintain varietal identity, purity and to produce seed of optimal physical, physiological and sanitary quality (Reddy et al. 2007). Formal seed system is managed by Government body (Government Institutions, State Government Farms, University farms & KVKs) and registered seed growers (NGOs, Private Companies) whereas ISS is managed by farmers and sometimes private seed growers.

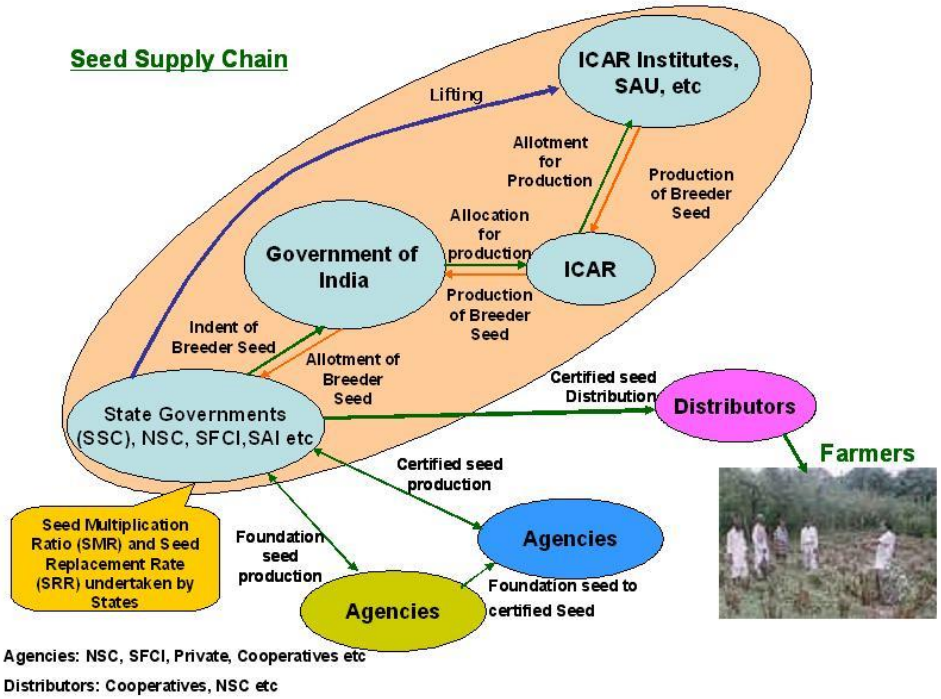

Fig. 1 1: Seed supply chain in quality seed production process

The policy gave access to Indian farmers of the best of seed and planting material available anywhere on the world. The policy stimulated appreciable investments by private individuals, Indian Corporate and MNCs in the Indian seed sector with strong R&D base for product development in each of the seed companies with more emphasis on high value hybrids of cereals and vegetables and hi-tech products such as Bt. Cotton. As a result, farmer has a wide product choice and seed industry today is set to work with a 'farmer centric' approach and is market driven. However, there is an urgent need for the State Seed Corporations also to transform themselves in tune with the industry in terms of infrastructure, technologies, approach and the management culture to be able to survive in the competitive market and to enhance their contribution in the national endeavour of increasing food production to attain food & nutritional security.

The M.P. Seed certification agency issues tags on the seeds which met the standards of seed certification prescribed in the Indian Minimum Seeds Certification Standards. These tags are stitched on the gunny bags of Standard sizes in which seeds are packed. The standard sizes of packing are 30 kgs, 40 kgs, 100 kgs etc. The gunny bags are procured from private institutions, through tendering process. The lot number, variety stage etc details are printed

on the bags & tags are stiched. The final tagged & bagged seed is distributed to the farmers of M.P. at a rate which is decided by the State Government. The seeds are distributed through various cooperative societies and centres of MP Rajya Beej Evam Farm Vikash Nigam like LAMPS, PACS, Co-operative societies, DMO, DDAs, Cash Sale etc. Similarly, seed storage is needed to store the seed during the period from receipt of seed at the plant till it is supplied to the dealer / farmer for sale. In the past three years Nigam has undertaken massive infrastructure development especially in storage facilities like building new godowns.

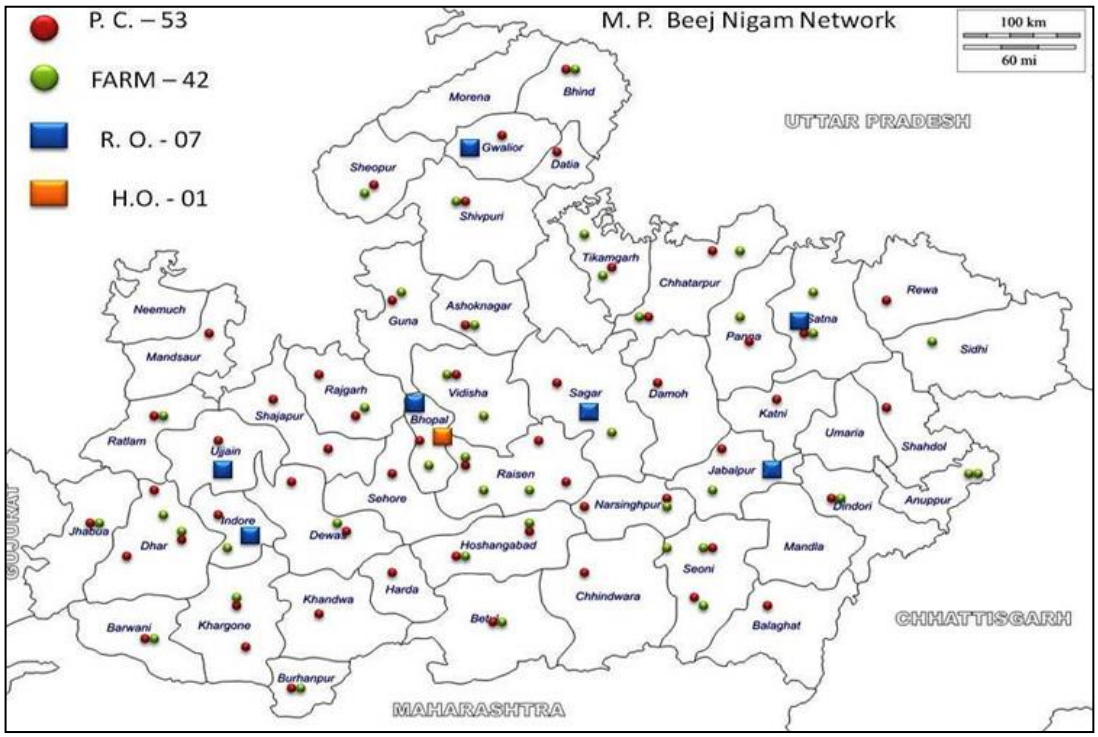

Fig. 1 2: Network area of Madhya Pradesh Beej Nigam

The Nigam produces about 3 lakh quintals of Foundation & Certified seeds in two season i.e. Kharif & Rabi. The Beej Nigam has 54 processing centers located at different district across the State. Seed processing plants are equipped with new grading machines needed for successful cleaning & grading operations.

According to the latest report entitled, "Seed Industry in India: Market Trends, Structure, Growth, Key Players and Forecast 2018-2023", the Indian seeds market reached a value of US$ 3.6 Billion in 2017, exhibiting a CAGR of around 17% during 2010-2017. The scarcity of quality seed, its timely unavailability, non-availability of quality seed of adopted varieties, high seed price and role of the middle-man in seed distribution were the challenges

in the process of seed availability of adopted improved varieties. Seed is the basic and most critical input for sustainable agriculture. The response of all other inputs depends on quality of seeds to a large extent. The farmers used to take seed programme from seed certification agencies of the specified crop varieties prevalent in their respective areas to fulfil the gap between the demand and supply of quality seed of different crop varieties. The seed certification agencies used to certify the seed produced by the farmers through certification process.

1.2 Objectives of the Study

a) To analyze organizational and functional structure of Seed Societies and its effectiveness in operations and governance.

b) To analyze profitability of seed production over grain production of selected crops.

c) To analyze farmers perception of quality seed production and identify various constraints related to efficient production and marketing of quality seed production.

1.3 Research Methodology

Hoshangabad, Dewas and Ujjain district have been selected purposively as per maximum seed distributed under wheat (55%), gram (23%) and soybean (10%) through MP Rajya Beej Evam Farm Vikash Nigam respectively across district of Madhya Pradesh. A list of all the seed distribution societies in the selected districts was prepared and top two seed distribute on societies in each district were selected for collection of data. Further, a list of producer members of each selected seed society was prepared and a sample of 20 beneficiaries from each society was selected randomly through proportionate random sampling method. Thus, the total size of sample constitute 20x2 (in each society) x3 (selected districts) =120 respondents of Madhya Pradesh.

Fig. 1 3: Selected District for the Study

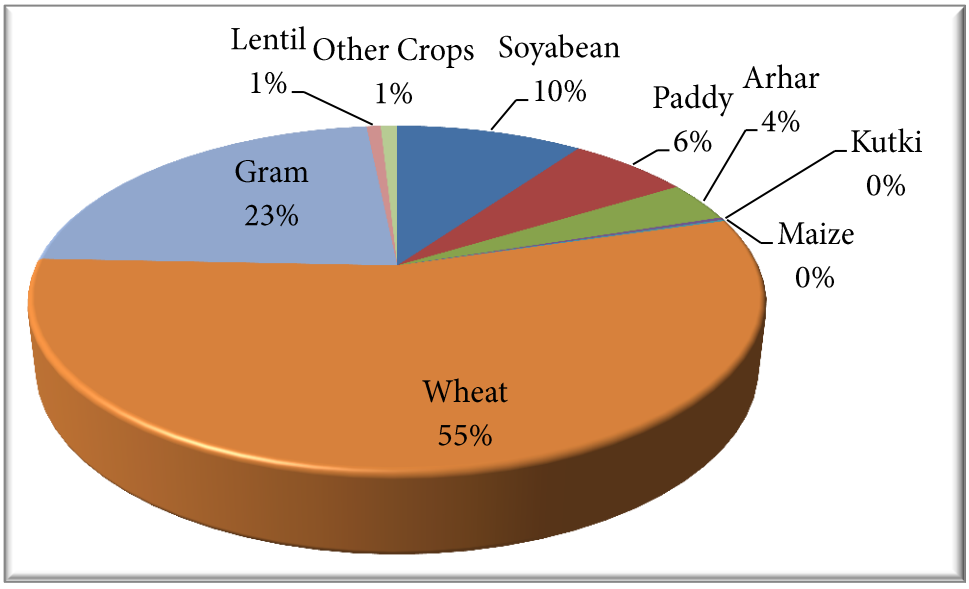

Fig. 1 4: Distribution of quality seed of crops through MP Rajya Beej Evam Farm Vikash Nigam (2021)

Table 1. 2: Distribution of quality seed through Madhya Pradesh Seed Certification Agency

S. No.	Crop	Qty in Qtl (2021)	%age to Grand Total
1	**Soyabean**	**9827**	**9.88**
2	Paddy	6384	6.42
3	Arhar	3737	3.76
6	Kutki	235	0.24
7	Maize	145	0.15
8	Other Crops	98	0.1
Total Kharif		**20426**	**20.54**
1	**Wheat**	**54895**	**55.2**
2	**Gram**	**22601**	**22.73**
3	Lentil	744	0.75
4	Other Crops	774	0.78
Total Rabi		**79014**	**79.46**
Grand Total		**99440**	**100**

Source: http://mpssfdc.mp.gov.in/Modules/Web/performance.aspx

Table 1. 3: Selected producer members from each selected district

Name of District	Name of Societies	No. of Villages covered	HHs
Ujjain	Sairam Beej Utpadak Sahkari Sanstha	4	19 (47.5)
	Shri sawriya Kishan Beej Utpadak Sahkari Sanstha	7	21 (52.5)
Total		**11**	**40 (100)**
Hoshangabad	Narmada Beej Utpadak Sahakari Samiti, Babai	15	22 (55)
	Shri Krishna Beej Utpadak samitee	9	18 (45)
Total		**24**	**40 (100)**
Dewas	Harnawada Beej Samitee	3	21 (52.5)
	Shanti Beej Utpadak Sahkari Sanstha	7	19 (47.5)
Total		**10**	**40 (100)**
Grand Total		**45**	**120 (100)**

Both primary and secondary data were collected for the study. The primary data were collected from the beneficiaries related to the agriculture year 2021-22. The primary data

were collected through the producer members with the help of pre-tested interview scheduled.

Fig. 1.5: Collection of Primary data by the investigators in Hoshangabad Location

Fig. 1.6: Collection of Primary data by the investigators in Ujjain Location

Fig. 1.7 Collection of Primary data by the investigators in Dewas Location

This interview schedule contained all the information related to the objective of the study viz. socio economic parameters i.e. demographic features, land use pattern,

cropping pattern, soil types, land holdings, Seed distribution channel, price of seed, irrigation potential, farm machinery, profitability and marketing pattern etc. while secondary data were collected from the website of http://mpssfdc.mp.gov.in of MP Rajya Beej Evam Farm Vikash Nigam, Bhopal and selected seed distribution societies located at different selected district of Madhya Pradesh. The software was developed on SutveyCTO online platform through Computer-Assisted Personal Interviewing (CAPI), Dobility India Ltd, Ahmadabad (Gujarat) used for collection, classification, tabulation and analyse of data. The Likert scale (1932) was used to analyse the data. It provides five possible answers to a statement or question that allows respondents to indicate their positive-to-negative strength of agreement or strength of feeling regarding the question or statement. A type of psychometric response scale in which responders specify their level of agreement to a statement typically in five points: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree.

1.4 Limitation of the Study

The study doesn't claim its completeness in all aspects and certainly had some limitations. The data related to the objectives of the study were collected from the selected seed producer members related to the societies. The information provided by them is based on interview and they don't keep any record of their farming practices. Therefore, the information provided by them is entirely based on their recall memory thus, there is possibility of certain biasness enter in the study.

1.5 Organization of the Study

The study comprises five chapters, chapter I include introduction, objectives, methodology & limitations. Chapter II deals with organization structure of selected seed producers cooperative societies. Profitability and farmer preferences towards quality seed production has been discussed in detail in chapter III. Summary, Conclusion and Policy Implication have been dealt in chapter IV followed by References.

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CHAPTER-II

ORGANIZATION STRUCTURE OF SEED PRODUCERS COOPERATIVE SOCIETIES

In this chapter, information regarding organization and governing body, number of farmers involved in seed production, convergence of seed producing cooperative societies with other institutions, seed supply and distribution from these cooperative societies is discussed in detail.

2.1 Organizational and Governing Body

Amongst various selected Seed Producer Cooperative Societies (SPCS) of wheat, gram and soybean, Narmada Beej Utpadak Sahkari Samiti, Babai, Hoshangabad & OM beej Pacodh Utpadak Evam Kroya Vikracy sahkari Samiti, Seoni – Malwa , Hoshangabad were related to wheat producers and registered during the year 2002 and 2008, respectively with initial membership of 11 and covering 1 and 6 villages in its vicinity. At present the membership was found to be increased to 50 and 21 respectively (Table 2.1).

Table 2. 1: Organization and Governing structure of the society

S. No.	Name of Society	Year of registration	Number of members' initial year	Number of members' current year	Number of villages covered
1	Narmada Beej Utpadak Sahkari Samiti, Babai, Hoshangabad	2002	11	50	1
2	OM beej Pacodh Utpadak Evam Kroya Vikracy sahkari Samiti, Seoni – Malwa , Hoshangabad	2008	11	21	6
3	Shanti Beej Utpadak Sahkari Samiti, Dewas	2009	21	60	6
4	Harnawada Beej Utpadak evm Krishi Vikash Sahakari Sanstha Maryadit, Harnawada, Dewas	2003	166	140	30
5	Shri Sanwliya Kisan Beej Utpadak sahkari Sanstha Maryadit, Mahidpur, Ujjain	2019	21	21	2
6	Sairam Beej Utpadak Sahkari Samiti, Badnagar Ujjain	2003	11	97	8

Shanti Beej Utpadak Sahkari Samiti, Dewas & Harnawada Beej Utpadak Evam Krishi Vikash Sahakari Sanstha Maryadit, Harnawada, Dewas were found to be related to gram producers and registered during the year 2009 and 2003, respectively with initial membership of 21 & 166 and covering 6 and 30 villages in its vicinity. At present the membership was

found to be increased to 60 in case of Shanti Beej Utpadak Sahkari Samiti, Dewas and 140 in case of Harnawada Beej Utpadak evm Krishi Vikash Sahakari Sanstha Maryadit, Harnawada, Dewas.

Shri Sanwliya Kisan Beej Utpadak sahkari Sanstha Maryadit, Mahidpur, Ujjain & Sairam Beej Utpadak Sahkari Samiti, Badnagar Ujjain were related to soybean producers and registered during the year 2019 and 2003 with initial membership of 21 & 11 and covering 2 to 8 villages, respectively in its vicinity. At present the membership was found to be increase in case of Sairam Beej Utpadak Sahkari Samiti, Badnagar Ujjain from 11 to 97, while in case of Shri Sanwliya Kisan Beej Utpadak sahkari Sanstha Maryadit, Mahidpur, Ujjain it was found to be remain same (21). In all the selected SPCSs, the membership as well as villages covered was found to be more in case of Harnawada Beej Utpadak evm Krishi Vikash Sahakari Sanstha Maryadit, Harnawada, Dewas. The membership of all the selected SPCSs was found to be increased in the current year as compared to initial year except Harnawada Beej Utpadak evm Krishi Vikash Sahakari Sanstha Maryadit, Harnawada, Dewas.

2.2 Governing body

The governing body of selected SPCSs consist of president, vice-president and producer members. A society was found to have on an average 1 president, 1 vice-president and 7 to 10 governing body producer members.

Table 2. 2: Governing body (Number)

S No.	Number of society	President/ Adhyakshay	Vice-president	Governing body
1	Narmada Beej Utpadak Sahkari Samiti, Babai, Hoshangabad	1	1	10
2	OM beej Pacodh Utpadak Evam Kroya Vikracy sahkari Samiti, Seoni – Malwa , Hoshangabad	1	1	7
3	Shanti Beej Utpadak Sahkari Samiti, Dewas	1	1	7
4	Harnawada Beej Utpadak evm Krishi Vikash Sahakari Sanstha Maryadit, Harnawada, Dewas	1	1	9
5	Shri Sanwliya Kisan Beej Utpadak sahkari Sanstha Maryadit, Mahidpur, Ujjain	1	1	8
6	Sairam Beej Utpadak Sahkari Samiti, Badnagar Ujjain	1	1	9
Average		**1**	**1**	**8**

2.3 Seed Production

The cent per cent registered producers members related to Narmada Beej Utpadak Sahkari Samiti, Babai, Hoshangabad, OM beej Pacodh Utpadak Evam Kroya Vikracy sahkari Samiti, Seoni – Malwa , Hoshangabad, Harnawada Beej Utpadak evm Krishi Vikash Sahakari Sanstha Maryadit, Harnawada, Dewas and Shri Sanwliya Kisan Beej Utpadak sahkari Sanstha Maryadit, Mahidpur, Ujjain SPCSs were found to be involved in seed production, while 40 and 6.19 per cent more producers them registered producer members related to Shanti Beej Utpadak Sahkari Samiti, Dewas and Sairam Beej Utpadak Sahkari Samiti, Badnagar Ujjain were found to be involved in seed production of gram and soybean, respectively (Table 2. 3). In total 7.77 per cent more farmers (416) them registered producer members (386).

Table 2. 3: Farmers involved in seed production

S No.	Number of society	Registered Producer Members	Seed producing farmers
Wheat			
1	Narmada Beej Utpadak Sahkari Samiti, Babai, Hoshangabad	50	50 (100)
2	OM beej Pacodh Utpadak Evam Kroya Vikracy sahkari Samiti, Seoni – Malwa , Hoshangabad	18	18 (100)
Gram			
3	Shanti Beej Utpadak Sahkari Samiti, Dewas	60	84 (140)
4	Harnawada Beej Utpadak evm Krishi Vikash Sahakari Sanstha Maryadit, Harnawada, Dewas	140	140 (100)
Soybean			
5	Shri Sanwliya Kisan Beej Utpadak sahkari Sanstha Maryadit, Mahidpur, Ujjain	21	21 (100)
6	Sairam Beej Utpadak Sahkari Samiti, Badnagar Ujjain	97	103 (106.19)
	Total	**386**	**416 (107.77)**

2.4 Convergence

All the selected SPCSs were found to have convergence with 5 to 7 institutions related to procurement, certification and selling of seed.

Table 2. 4: Convergence

S No.	Number of society	Name of convergence institution	Which type of convergence/benefit
1	Narmada Beej Utpadak Sahkari Samiti, Babai, Hoshangabad	IARI, Farm Indore	Seed Purchased
		JNKVV, Jabalpur	Seed Purchased
		IIWR, Karnal	Seed Purchased
		Anand Institute Gujarat	Seed Purchased
		Seed Certification Office, Hoshnagabad	Seed certification
		Farmer Welfare and Agriculture Development Department, Hoshnagabad	Seed Sold
		PACS, Hoshnagabad	Seed Sold
2	OM beej Pacodh Utpadak Evam Kroya Vikracy sahkari Samiti, Seoni – Malwa , Hoshangabad	IARI, Farm Indore	Seed Purchased
		JNKVV, Jabalpur	Seed Purchased
		SAYDU, Dantewada	Seed Purchased
		Seed Certification Office, Hoshnagabad	Seed certification
		Farmer Welfare and Agriculture Development Department, Hoshnagabad	Seed Sold
3	Shri Sanwliya Kisan Beej Utpadak sahkari Sanstha Maryadit, Mahidpur, Ujjain	IARI, Farm Ujjain	Seed Purchased
		DR, Ujjain	Seed Supply
		Seed Certification Office, Ujjain	Seed certification
		Farmer Welfare and Agriculture Development Department, Ujjain	Seed Sold
		PACS, Ujjain	Seed Sold
4	Sairam Beej Utpadak Sahkari Samiti, Badnagar Ujjain	KVK, Ujjain	Seed Purchased
		Agriculture College, Kota	Seed Purchased
		DR, Ujjain	Seed Supply
		Seed Certification Office, Ujjain	Seed certification
		Farmer Welfare and Agriculture Development Department, Ujjain	Seed Sold
		PACS, Ujjain	Seed Sold
		State Seed Federation, Bhopal	Initiate to farmers for production of foundation and certified seed through Seed society
5	Shanti Beej Utpadak Sahkari Samiti, Dewas	KVK, Dewas	Seed Purchased
		RVSKVV Farm, Ujjain	Seed Purchased
		JNKVV, Jabalpur	Seed Purchased
		IARI Farm, Indore	Seed Purchased
		Seed Certification Office, Ujjain	Seed certification
		Farmer Welfare and Agriculture Development Department, Dewas	Seed Sold
		PACS, Dewas	Seed Sold
6	Harnawada Beej Utpadak evm Krishi Vikash Sahakari Sanstha Maryadit, Harnawada, Dewas	RVSKVV Farm, Ujjain	Seed Purchased
		JNKVV, Jabalpur	Seed Purchased
		IARI Farm, Indore	Seed Purchased
		State Seed Federation, Bhopal	Initiate to farmers for production of foundation and certified seed through Seed society
		Seed Certification Office , Ujjain	Seed certification
		Farmer Welfare and Agriculture Development Department, Dewas	Seed Sold
		PACS, Dewas	Seed Sold

On an average a SPCSs was found to have maximum convergence for purchase of seed only, while the convergence with other institute was found to be with only one institutions i.e. Department of Farmer Welfare and Agriculture Development (Department of Agriculture) for selling of seed.

2.5 Purchase & Distribution of Seed

In total these selected societies were found to purchase and distributed 142.40 q of seeds of wheat, gram & soybean to producer members during the year 2021, in which the share of breeder seed (62.08%) was found to be more than foundation seed.

Table 2. 5: Purchased and distribution type of seed of different crops

S No.	Number of society	Stage of seed	Purchased/mother seed		Sold to farmers (Rs/q)	Margin /q (Rs)
			Quantity (q)	Price (Rs/q)		
Wheat						
1	Narmada Beej Utpadak Sahkari Samiti, Babai, Hoshangabad	Breeder	24.9	6650	6790	140
2	OM Beej Pacodh Utpadak Evam Kroya Vikracy sahkari Samiti, Seoni – Malwa , Hoshangabad	Breeder	31.4	6700	6850	150
Gram						
3	Shri Sanwliya Kisan Beej Utpadak sahkari Sanstha Maryadit, Mahidpur, Ujjain	Breeder	2.4	11625	11875	250
		Foundation	54	5138	5338	200
		Total	56.4	5414	5616	202
4	Sairam Beej Utpadak Sahkari Samiti, Badnagar Ujjain	Breeder	5.3	8500	8800	300
Soybean						
5	Shanti Beej Utpadak Sahkari Samiti, Dewas	Breeder	3.2	12400	12600	200
6	Harnawada Beej Utpadak evm Krishi Vikash Sahakari Sanstha	Breeder	21.2	12400	12700	300
Total						
	Breeder		88.4 (62.08)		223 (Average)	
	Foundation		54 (37.92)		200 (Average)	
	Total		142.4 (100)		-	

(University/ KVK/ Research Centre, MP Rajya beej Evam farm Vikash Nigam)

On an average a society was found to earn profit of Rs. 223/q and Rs. 200/q on breeder and foundation seed, respectively, in distribution of seed to producer member (Table 2.5).

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CHAPTER-III

SOCIO-ECONOMIC PROFILE OF THE HOUSEHOLDS

This chapter deals with socio-economic profile of the selected farmers their operational holdings, cropping pattern, sources of irrigation, farm assets for the respondents of selected crops viz. wheat, gram & soybean in Madhya Pradesh.

3.1 Socio-economic Profile

In socio-economic, social characteristics of selected farmers, including size of family, operational land holdings, sources of irrigation cropping pattern and farm assets have been considered for the study.

3.1.1 Social Characteristics

The social characteristics of selected respondents involved in producing seeds of wheat, gram and soybean with respect to their gender, religion, age, education, caste and occupation is presented in Table 3. 1. The respondent's producing seeds of wheat, gram and soybean were found to be 40 in each case. In case of wheat, all the respondents were found to be of Hindu religion out of which 87.5% were found to be male and 12.5% female. The majority of them were found to belong to age group of 31 to 59 years (95%), while remaining from the age group of 60 or above (5%). The 27.5% were found to be educated up to graduate level and high school (27.5%) followed by higher secondary (25%), above graduate (12.5%) and middle level (7.5%). The majority of them were found to belongs to OBC (80%) and General (20%) category. The primary occupation of all the respondents was found to be agriculture, while 30 and 18 per cent of them also involved in secondary occupation such as agricultural labour and others, respectively.

The cent per cent respondents involved in producing gram were found to be male and belongs to Hindu (92.5%) and other religion (7.5 %). The majority of them were found to belong to the age group of 31 to 59 years (82.5%) followed by above or equal to 60 years (15%) and below or equal 30 years (2.5%). They were found to be educated up to high school (52.5%) followed by higher secondary (22.5%) graduate (17.5%) above graduate (5%) and middle level (2.5%).

Table 3. 1: Social Characteristics of selected farmers (Numbers)

Particulars		Seed producers related to		
		Wheat	Gram	Soybean
Gender				
Male		35 (87.5)	40 (100)	37 (92.5)
Female		5 (12.5)	0 (0)	3 (7.5)
Religion				
Hindu		40 (100)	37 (92.5)	40 (100)
Other		0 (0)	3 (7.5)	0 (0)
Age				
Below or Equal 30		0 (0)	1 (2.5)	4 (10)
Above or Equal 60		2 (5)	6 (15)	9 (22.5)
Equal to 31 to 59		38 (95)	33 (82.5)	27 (67.5)
Education				
Primary		0 (0)	0 (0)	1 (2.5)
Middle		3 (7.5)	1 (2.5)	2 (5)
Higher School		11 (27.5)	21 (52.5)	25 (62.5)
Higher Secondary		10 (25)	9 (22.5)	6 (15)
Graduate		11 (27.5)	7 (17.5)	6 (15)
Above		5 (12.5)	2 (5)	0 (0)
Caste of the Respondents				
General		8 (20)	23 (57.5)	19 (47.5)
OBC		32 (80)	16 (40)	20 (50)
SC		0 (0)	0 (0)	1 (2.5)
ST		0 (0)	1 (2.5)	0 (0)
Occupation				
Primary		40 (100)	40 (100)	40 (100)
Secondary	Agril. labour	12 (30)	32 (80)	6 (15)
	Others (Pandit, Teacher etc.)	28 (70)	8 (20)	29 (72.5)

Figure in parenthesis shows percentage to total respondents (n=40)

The majority of them General (57.5%) followed by OBC (40%) and ST (2.5%) categories. The primary occupation of all the respondents was found to be agriculture. The 28

and 14 per cent of them also earned the income from secondary sources i.e. agricultural labour and others.

The male and female Soybean seed producing respondents were found to be 92.5 and 7.5 per cent respectively. All the respondents were found to be of Hindu religion, out of which 67.5 per cent belongs to the age group of 31 to 59 years followed by above or equal to 60 years (22.5%) and below or equal to 30 years (10%). They were found to be educated up to high school level (62.5%) followed by higher secondary (15%), graduate (15 %), middle level (5%) and up-to primary (2.5%). The majority of them were found to be belong to OBC (50%) followed by general (47.5%) and SC categories (2.5%). The primary occupation of all the respondents was found to be agriculture, while agricultural labourer (15%) and others (72.5%) as secondary occupation.

3.2 Size of Family

The average size of family of the respondents related to seed producers of wheat, gram and soybean and members engaged in crop production is presented in Table 3. 2.

Table 3. 2: Average size of Family related to selected farmers (Number)

Particulars		Seed producers related to		
		Wheat	Gram	Soybean
Family Member	Male	3	2	2
	Female	2	2	2
	Children	2	2	2
Total		**7**	**6**	**6**
Engaged in Crop Production (% to total Family Member)	Male	2	2	2
	Female	1	1	1
	Children	0	0	0
Total		**3**	**3**	**3**

Figure in parenthesis show percentage to total

The average size of family of wheat seed producers was found to be 7, constituting 3 male, 2 female and 2 children, out of which 3 persons (2 male and 1 female) were found to be engaged in crop production. In case of gram and soybean seed producers, the average size of family was found to be 6, constituting 2 male, 2 female and 2 children, out of which half of them (2 male and 1 female) were found to be engaged in crop production.

3.3 Operational Land Holding

The size of land holding, cultivated land, uncultivated land, fallow land, leased-in land and leased-out land across an average wheat, gram and soybean seed producers are presented in Table 3. 3.

Table 3. 3: Land holdings (acre)

Particulars	Seed producers related to		
	Wheat	**Gram**	**Soybean**
Size of Holdings (Owned)	16.81 /100/	15.41 /100/	16.34 /100/
Cultivated Land	16.81 (73.37)	15.00 (100.00)	16.34 (100)
Uncultivated Land	0.00 /0.00/	0.39 /2.53/	0.00 /0.00/
Fallow Land	0.00 /0.00/	0.02 /0.13/	0.00 /0.00/
Lease-in Land	6.10 (26.63)	0.00 (0.00)	0.00 (0.00)
Lease-out Land	0.00 /0.00/	0.00 /0.00/	0.00 /0.00/
Net Operated Area	**22.91 (100.00)**	**15.00 (100.00)**	**16.34 (100.00)**

Figure in bracket shows percentage to net operated area, while figure in slash shows percentage to total owned land

An average wheat producer was found to have 16.81 acres of land and the whole land was under cultivation. The leased-in land was found to be 6.10 acres. An average gram producers was found to have 15.41 acres of land, out of which 97.34% (15 acre) was under cultivation, while 2.53 & 0.13 per cent was found under uncultivated & fallow land. In case of soybean an average seed producer was found to have 16.34 acres of land and whole land was found under cultivation.

3.4 Sources of Irrigation

The source wise irrigation as per household and area irrigated across an average wheat, gram and soybean seed producers are presented in Table 3. 4. The 90 and 10 per cent wheat producer were found to irrigate their 84.83 and 15.17 per cent area through canal and tube-well respectively, while the majority of gram producers irrigate their operated land through tube-well (47.5%) followed by well (42.5 %) and river/pond (10%). In case of soybean

67.5, 27.5 and 5 per cent respondents used to irrigate their operated area through tube-well, well and canal sources of irrigation respectively. An average wheat, gram and soybean producer was found to irrigated their 74.51, 100 & 86.98 per cent, respectively cultivated area in the area under study.

Table 3. 4: Sources of irrigation

Particulars	As per HH (Numbers)			Area per Farm (Acre)		
	Wheat	Gram	Soybean	Wheat	Gram	Soybean
Well	0 (0)	17 (42.5)	11 (27.5)	0	8.38	15.82
Tube-well	4 (10)	19 (47.5)	27 (67.5)	19	19.47	13.56
Canal	36 (90)	0 (0)	2 (5)	11.81	0	14.25
River/Pond	0 (0)	4 (10)	0 (0)	0	22	0
Total	**40 (100)**	**40 (100)**	**40 (100)**	12.53	15	14.21
Percentage of irrigated land to cultivated land				**74.51**	**100**	**86.98**

3.5 Cropping Pattern

The cropping pattern of wheat, gram and soybean seed producers was analysed and presented in Table 3. 5. It is observed from the data that an average wheat seed producer cultivated his operated land 146.88 per cent more (Cropping Intensity 246.88%) in a year. He was found to be devoted his 40.51, 40.51, & 18.98 per cent operated area in rabi, kharif and zaid seasons, respectively. Soybean & paddy and wheat & gram were found to be major kharif and rabi crops grown in his farm. In summer season he was found to devote his operated land in cultivation of Moong/Urd only. An average gram producer cultivated his operated land 100 per cent more in a year. He devoted his maximum land in kharif (55.07%) as compared to rabi (49.94%) season. Soybean (100%) & wheat (40.35%) & gram (58.98%) were found to be major crops cultivated in kharif and rabi season, respectively. He was also found to cultivate onion & garlic in rabi season as a minor crops.

Table 3. 5: Copping pattern (per HH)

Crops	Seed producers related to		
	Wheat	**Gram**	**Soybean**
Soybean	12.51 (54.61)	15.00 (100)	14.21 (86.99)
Paddy	9.70 (42.33)	0.00 (0.00)	0.00 (0.00)
Urd/Moong	0.50 (2.18)	0.00 (0.00)	1.90 (11.63)
Till	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Others	0.20 (0.87)	0.00 (0.00)	0.23 (1.38)
Total Kharif	**22.91 (40.51)**	**15.00 (50.07)**	**16.34 (52.05)**
Wheat	13.90 (60.67)	6.04 (40.35)	10.45 (69.44)
Gram	9.01 (39.33)	8.82 (58.98)	2.79 (18.52)
Lentil	0.00 (0.00)	0.00 (0.00)	0.15 (1)
Onion	0.00 (0.00)	0.025 (0.17)	0.58 (3.82)
Garlic	0.00 (0.00)	0.08 (0.5)	1.09 (7.23)
Total Rabi	**22.91 (40.51)**	**14.96 (49.94)**	**15.05 (47.95)**
Summer Moong/Urd	10.74 (18.98)	0.00 (0.00)	0.00 (0.00)
Gross Cropped Area	56.56 (100)	29.96 (100)	31.39 (100)
Cropping Intensity (%)	**246.88**	**200**	**193**

The cropping intensity of an average soybean seed producer was found to be 193 per cent, reveals that he was operated 93 per cent more area than his cultivated area in a year. He was found to devote his maximum operated area in kharif (52.05%) followed by rabi (47.95%) season. Soybean (86.99%) followed by moong/urd (11.63%) were found to be main kharif crops, while wheat (69.44%), gram (18.52%), lentil (1.00%), onion (3.82%) & garlic (7.23%) were the major and minor rabi crops grown in his farm.

3.6 Farm Assets

The farm assets across wheat, gram and soybean seed producers are presented in Table 3. 6. On an average wheat, gram and soybean seed producers were found to have farm assets of ₹ 586288/-, ₹ 292253/- & ₹ 913312/-, respectively. On an average in wheat producer farm out of total assets the value of tractor (57.54%) was found to be maximum followed by trolley (13.87%), electric motor (8.08%), seed drill (7.27%), plough (6.78%), grader (2.75%) power sprayer (2.25%) and thresher (0.92%).

Table 3. 6: Farm assets of HHs (Amount Rs./HH)

Particulars	Seed producers related to		
	Wheat	**Gram**	**Soybean**
Tractor	337350 (57.54)	162575 (55.63)	677750 (74.21)
Trolley	81325 (13.87)	35300 (12.08)	60450 (6.62)
Plough	39725 (6.78)	16400 (5.61)	31075 (3.4)
Seed drill	42638 (7.27)	22875 (7.83)	35025 (3.83)
Thresher	5375 (0.92)	5875 (2.01)	48450 (5.3)
Grader	16150 (2.75)	300 (0.1)	713 (0.08)
Power Sprayer	13215 (2.25)	3650 (1.25)	13725 (1.5)
Hand Sprayer	3150 (0.54)	638 (0.22)	758 (0.08)
Electric motor	47360 (8.08)	41425 (14.17)	45125 (4.94)
Diesel Pump	 (0)	2050 (0.7)	0 (0)
Sprinkler Set	0 (0)	0 (0)	113 (0.01)
other	0 (0)	1165 (0.4)	128 (0.01)
Total	**586288 (100)**	**292253 (100)**	**913312 (100)**

The value of tractor (55.63%) was also found to be maximum out of total assets followed by electric motor (14.17%), trolley (12.08%), seed drill (7.83%), plough (5.61%),

thresher (2.01%), power sprayer (1.25%), diesel engine (0.7%), hand sprayer (0.22%) & other (0.4%) in an average gram producer farm. In an average soybean producer farm the value of tractor (74.21%) was found to be maximum followed by trolley (6.62%), grader (5.3%), electric motor (4.94 %) seed drill (3.83%), plough (3.4%), power sprayer (1.5%) hand sprayer (0.08%) and grader (0.08%), sprinkler set (0.01%)and others (0.01%) in total assts.

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CHAPTER-IV

PROFITABILITY & FARMER PREFERENCES TOWARDS QUALITY SEED PRODUCTION

This chapter deals with the inputs used, quality parameter & technological adoption for quality seed production, purchased seed, cost incured in cultivation, profitability of seed production, farmer preferences and constraints faced by producer members in production and marketing of quality seed under selected crops viz. wheat, gram & soybean in Madhya Pradesh.

4.1 Quality Seed Procured

The type of seed and variety procured by the SPCSs for quality seed producers are presented in Table 3. 7. SPCSs were found to introduce seed GW 322, GW 451, HI 1634 and Tejas HI 8759 of latest developed varieties of wheat to their 52.5, 40, 2.5 & 15 per cent of producer members, respectively. An average producer of wheat was found to consume 17.55, 12.35, 2.00 & 5.83 kg breeder seeds of these varieties, respectively for cultivation of wheat for seed production on his farm.

RVG 202 was found to be a latest developed variety of gram distributed amongst all the gram growers by the SPCSs for production of quality seed of gram in the area under study. An average gram producer was found to consume only 3.42 kg breeder seed of RVG 202 in his farm.

In case of soybean breeder seed of varieties RVS 104, JS-20-29 & JS-95-60 as well as foundation seeds of varieties JS-95-60, RVS-2011-04, JS-20-34 & JS-93-05 (latest developed varieties) were found to be distributed amongst the producer members. The 2.5 per cent of breeder seed of each variety was found to be distributed among the producer members. As regards to foundation seed the maximum seed was found to be distributed by the SPCSs of variety JS-95-60 (70%) followed by JS-20-34 (12.5%), RVS-2011-04 (10%) & JS-93-05 (5%). The quantity of these varieties distributed to seed producer was found to be raged between 1.20 (JS-20-29) to 6.83 (RVS-2011-04) per soybean seed producer.

Table 4. 1: Seed purchased by the respondents

Type of Seed	Variety	Total Number of HH	Quantity/ respondent
Wheat			
Breeder	GW 322	21 (52.5)	17.55
	GW 451	16 (40)	12.35
	HI-1634	1 (2.5)	2.00
	Tejas HI-8759	6 (15)	5.83
Gram			
Breeder	RVG 202	40 (100)	3.42
Soybean			
Breeder	RVS104	1 (2.5)	3.00
	JS-2029	1(2.5)	1.20
	JS-9560	1(2.5)	3.20
Foundation	JS 9560	28 (70)	3.45
	RVS-20011-04	4 (10)	6.83
	JS 2034	5 (12.5)	3.70
	JS 9305	2 (5)	4

Figure in parenthesis show percentage to total (40)

4.2 Cost and Return Analysis

The economic analysis of seed over grain production of selected crops viz. wheat, gram and soybean was analyse for the study.

4.2.1 Wheat

The cost incurred and returns obtained in cultivation of wheat seed over grains in a acre of land is presented in Table 3. 8. On an average quality seed producer of wheat was found to invest 10.24 per cent (Rs. 2134/acre) more in cultivation of quality seed production and earned 50.62 per cent more net return as compared to cultivation of wheat as a grain production. He was found to earn Rs. 8.81 additional over an additional investment of Rs. 1.00 in cultivation of quality seed over grain production. His cost of production of producing

a quintal of quality seed (Rs. 1488/q) was found to be Rs. 29.31 per cent more as compared to production of grain (Rs. 1150/q).

An average wheat producer was found to invest 24.21, 25.0, 35.71.16.67 and 14.29 per cent more in seed, plant protection chemicals, herbicide/weedicide, irrigation and human labour days, respectively, while invested less in manure (-29.21%), Urea (-18.88%) and DAP fertilizer (-15.89%) in cultivation of quality seed over grain production (Table 3.8).

Table 4. 2: Cost incurred and return obtained in cultivation of Wheat seed over grain (Rs/acre)

Particulars	Seed Production			Grain Production			% Change Over Grain
	Quantity	Rate	Value	Quantity	Rate	Value	
Total Paid-Out Cost							
Seed (Kg)	35.86	67	2403	47.18	41	1934	24.21
Manure (qtl)	5.8	350	2030	8.2	350	2870	-29.27
fertilizers-Urea (Kg)	63.52	5	330	78.3	5	407	-18.88
DAP/12:32:16 (Kg)	45	32	1430	53.5	32	1700	-15.89
Plant protection chemical (l.)	0.05	630	32	0.04	630	25	25.00
Herbicide/weedicide (l.)	0.38	810	308	0.28	810	227	35.71
Diesel for irrigation (l.)	21	80	1680	18	80	1440	16.67
Electricity	-	2600	2600	-	2600	2600	0.00
Human Labour days	28	300	8400	21	300	6300	33.33
Machinery Hrs	4	850	3400	3.5	850	2975	14.29
Total Cost			22612			20479	10.42
Returns							
Yield q/acre) Main Product	15.2	3700	56240	17.8	1950	34710	62.03
By-Product	21.28	750	15960	24.92	750	18690	-14.61
Gross Income			72200			53400	35.21
Net Income			49588			32921	50.62
Cost of Production			1488			1150	29.31
Per Rupees Return			3.19			2.61	-
Additional Cost over grain	2134						
Additional profit over grain	18800						
Additional net return	16666						
Additional per rupee return	8.81						

Amongst, different components of cost of cultivation (paid out cost) of quality seed production, the highest cost was found to be incurred in human labour (37%) followed by

machine hrs (15%), electricity (12%), seed (11%), manure (9%), irrigation (7%), DAP fertilizer(6%),Urea fertilizer (2%) and hervicide/weedicide (1%) (Fig 3.1).

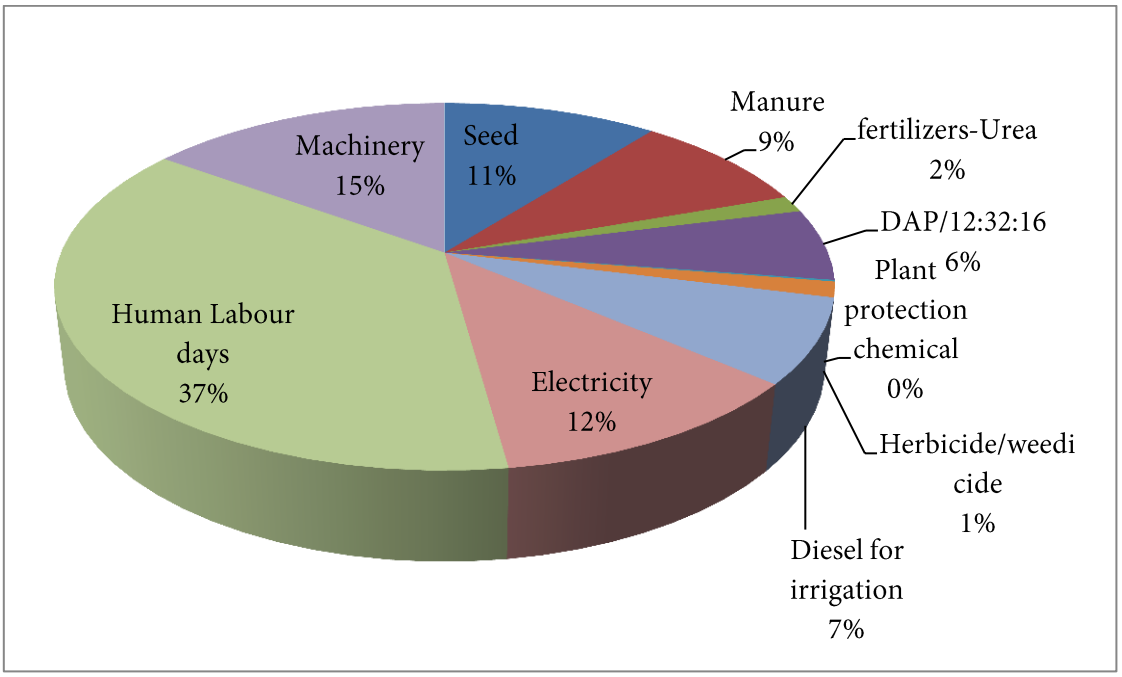

Fig. 4 1: Per cent contribution of different components of cost of cultivation (Quality Seed Production-Wheat-Total Cost of Cultivation Rs. 22612/-)

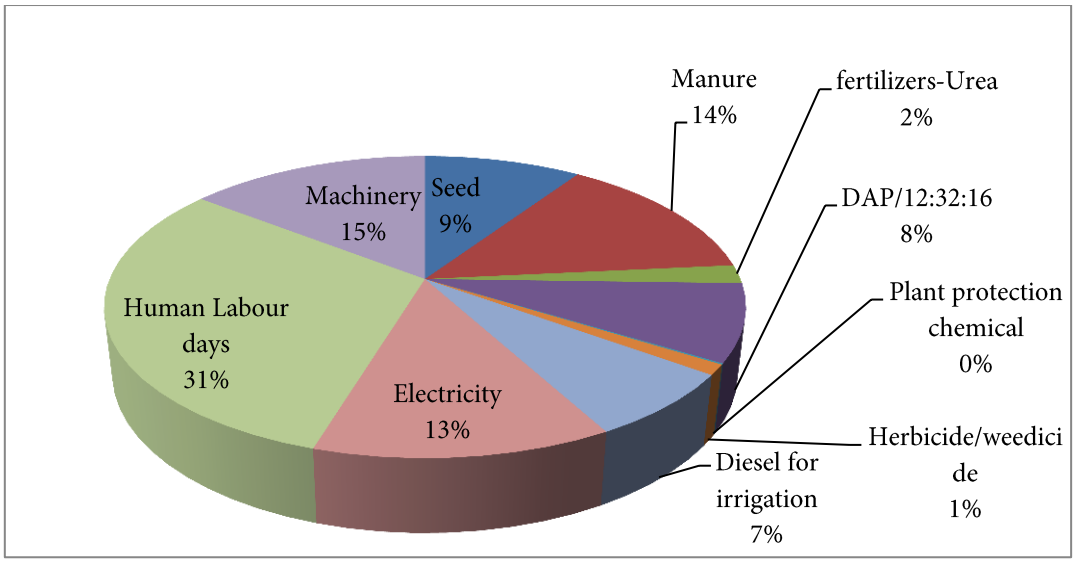

Fig. 4 2: Per cent contribution of different components of cost of cultivation(Grain Production-Wheat-Total Cost of Cultivation Rs. 20479/-)

Amongst, different components of cost of cultivation (paid out cost) of grain production, the highest cost was found to be incurred in human labour (31%) followed by machine hrs (15%), manure (14%), electricity (13%), DAP fertilizer (10%), seed (9%), irrigation (7%), Urea fertilizer (2%) and herwicide/weedicide (1%)(Fig 3.1).

4.2.2 Gram

The cost incurred and returns obtained in cultivation of gram seed over grains in a acre of land is presented in Table 3. 9.

Table 4. 3: Cost incurred and return obtained in cultivation of Gram seed over grain (Rs/acre)

Particulars	Seed Production			Grain Production			% Change Over Grain
	Quantity	Rate	Value	Quantity	Rate	Value	
Total Paid-Out Cost							
Seed (Kg)	21.6	126	2722	26.7	55	1469	85.33
Manure (qtl)	3.8	325	1235	3.1	325	1008	22.58
fertilizers-Urea (Kg)	18.22	5	95	24.13	5	125	-24.49
DAP/12:32:16 (Kg)	42.75	32	1359	63.5	32	2018	-32.68
Plant protection chemical (l.)	0.88	580	510	0.61	580	354	44.26
Herbicide/weedicide (l.)	0.66	740	488	0.57	740	422	15.79
Diesel for irrigation (l.)	4.5	80	360	4	80	320	12.50
Electricity	-	2400	2400	-	2400	2400	0.00
Human Labour days	24	300	7200	21	300	6300	14.29
Machinery Hrs	3.5	850	2975	3	850	2550	16.67
Total Cost			19344			16965	14.02
Returns							
Yield q/acre) Main Product	5.68	5800	32944	5.85	5200	30420	8.30
By-Product	8.52	750	6390	8.19	750	6143	4.03
Gross Income			39334			36563	7.58
Net Income			19990			19598	2.00
Cost of Production			3406			2900	17.43
Per Rupees Return			2.03			2.16	-
Additional Cost over grain	2379						
Additional profit over grain	2772						
Additional net return	393						
Additional per rupee return	1.17						

An average quality seed producer of gram was found to invest 14.02 per cent (Rs. 2379/acre) in cultivation of quality seed production and earned 7.58 per cent more net return as compared to cultivation of gram as a grain production. He was found to earn Rs. 1.17 additional over an additional investment of Rs. 1.00 in cultivation of quality seed over grain production. His cost of production of producing a quintal of quality seed (Rs. 3406/q) was found 17.43 per cent more as compared to production of grain (Rs. 2900/q).

An average gram producer was found to invest 85.33, 22.58, 44.26, 15.79, 12.50, 14.29 and 16.67 per cent more in seed, manure, plant protection chemicals, herbicide/weedicide, irrigation, human labour days and machine hrs respectively, while invested less in Urea (-24.49%) and DAP fertilizer (-32.68%) in cultivation of quality seed over grain production (Table 3. 9).

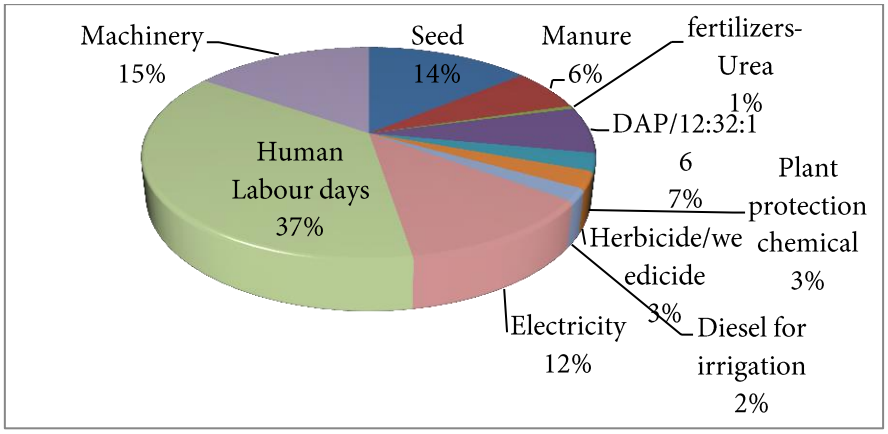

Fig. 4 3: Per cent contribution of different components of cost of cultivation (Quality Seed Production-Gram--Total Paid-Out Cost of Cultivation Rs. 19344/-)

Amongst, different components of cost of cultivation (paid out cost) of quality seed production, the highest cost was found to be incurred in human labour (37%) followed by machine hrs (15%), seed (14%), electricity (12%), manure (6%), irrigation (2%), DAP fertilizer(7%),Urea fertilizer (1%), plant protection chemical (3%) and hervicide/weedicide (3%) (Fig 3.3).

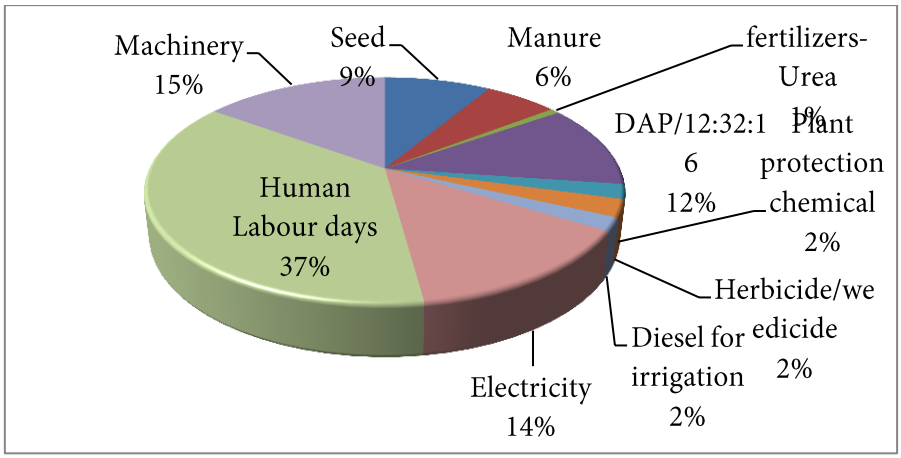

Fig. 4 4: Per cent contribution of different components of cost of cultivation(Grain Production-Gram- Total Paid-Out Cost of Cultivation Rs. 16965/-)

Amongst, different components of cost of cultivation (paid out cost) of grain production, the highest cost was found to be incurred in human labour (37%) followed by machine hrs (15%), electricity (14%), DAP fertilizer(12%), seed (9%), manure (6%), irrigation (2%), Urea fertilizer (1%), plant protection chemical (2%) and hervicide/weedicide (2%)(Fig 3.4).

Table 4. 4: Cost incurred and return obtained in cultivation of Soybean seed over grain (Rs/acre)

Particulars	Seed Production			Grain Production			% Change Over Grain
	Quantity	Rate	Value	Quantity	Rate	Value	
Total Paid-Out Cost							
Seed (Kg)	32.92	51	1679	38.15	42	1602	4.78
Manure (qtl)	4.6	370	1702	2.1	370	777	119.05
fertilizers-Urea (Kg)	21.23	5	110	24.45	5	127	-13.17
DAP/12:32:16 (Kg)	48.13	32	1529	44.88	32	1426	7.24
Plant protection chemical(l.)	1.42	790	1122	1.48	790	1169	-4.05
Herbicide/weedicide (l.)	1.66	1150	1909	1.54	1150	1771	7.79
Electricity	0.00	4700	4700	0.00	4700	4700	0.00
Human Labour days	28	300	8400	21	300	6300	33.33
Machinery Hrs	3.5	850	2975	3	850	2550	16.67
Total Cost			24127			20423	18.14
Returns							
Yield q/acre) Main Product	4.53	5600	25368	4.61	4200	19362	31.02
By-Product	5.436	750	4077	5.993	750	4495	-9.29
Gross Income			29445			23857	23.42
Net Income			5318			3434	54.88
Cost of Production			5326			4430	20.22
Per Rupees Return			1.22			1.17	-
Additional Cost over grain	3704						
Additional profite over grain	5588						
Additional net return	1884						
Additional per rupee return	1.51						

4.3.3 Soybean

An average quality seed producer of soybean was found to invest 18.14 per cent (Rs. 3704/acre) in cultivation of quality seed production and earned 54.88 per cent more net

return as compared to cultivation of soybean as a grain production (Table 3.10). He was found to earn Rs. 1.51 additional over an additional investment Rs. 1.00 in cultivation of quality seed over grain production. His cost of production of producing a quintal of quality seed (Rs. 5326/q) was found to be 20.22 per cent more as compared to production of grain (Rs. 4430/q).

An average soybean producer was found to invest 4.78, 119.05, 7.24, 7.79, 33.33 and 16.67 per cent more in seed, manure, DAP/12:32:16 fertilizer, herbicide/weedicide and human labour days, respectively, while invested less in plant protection chemicals (-4.05%) and Urea fertilizer (-13.17%) in cultivation of quality seed over grain production (Table 3. 10).

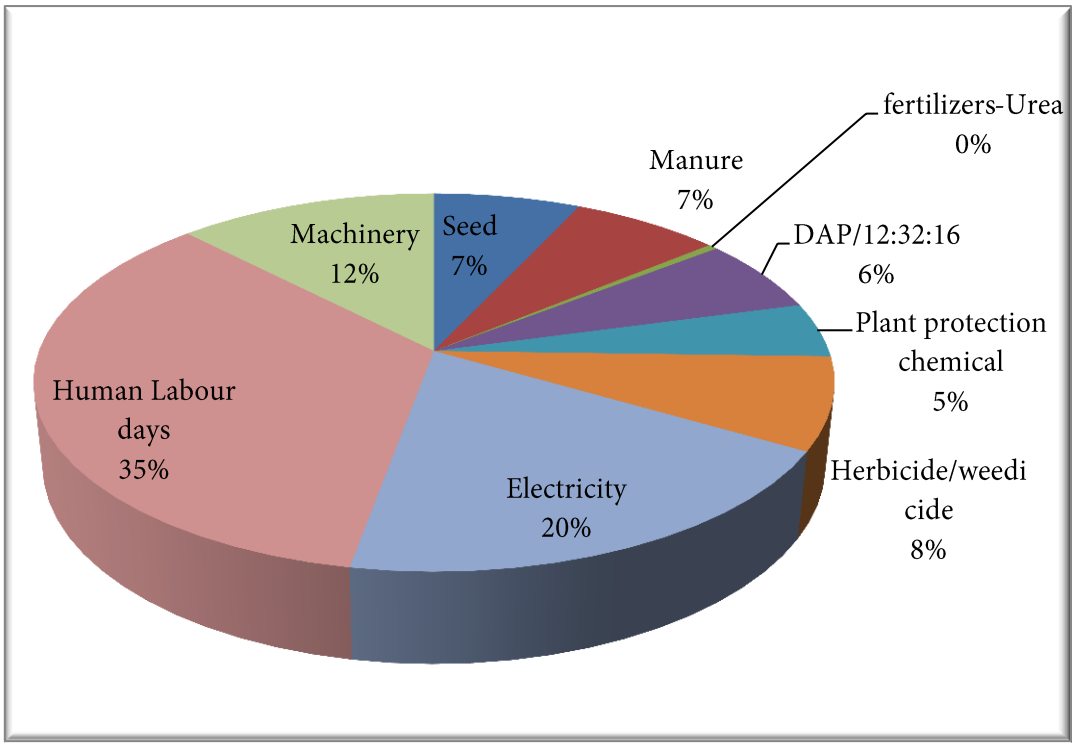

Fig. 4 5: Per cent contribution of different components of cost of cultivation(Quality Seed Production-Soybean- Total Paid-Out Cost of Cultivation Rs. 24127/-)

Amongst, different components of cost of cultivation (paid out cost) of quality seed production, the highest cost was found to be incurred in human labour (35%) followed by machine hrs (12%), electricity (20%), seed (7%), manure (7%), DAP fertilizer(6%), plant protection chemicals (5%) and hervicide/weedicide (8%) (Fig 3.5).

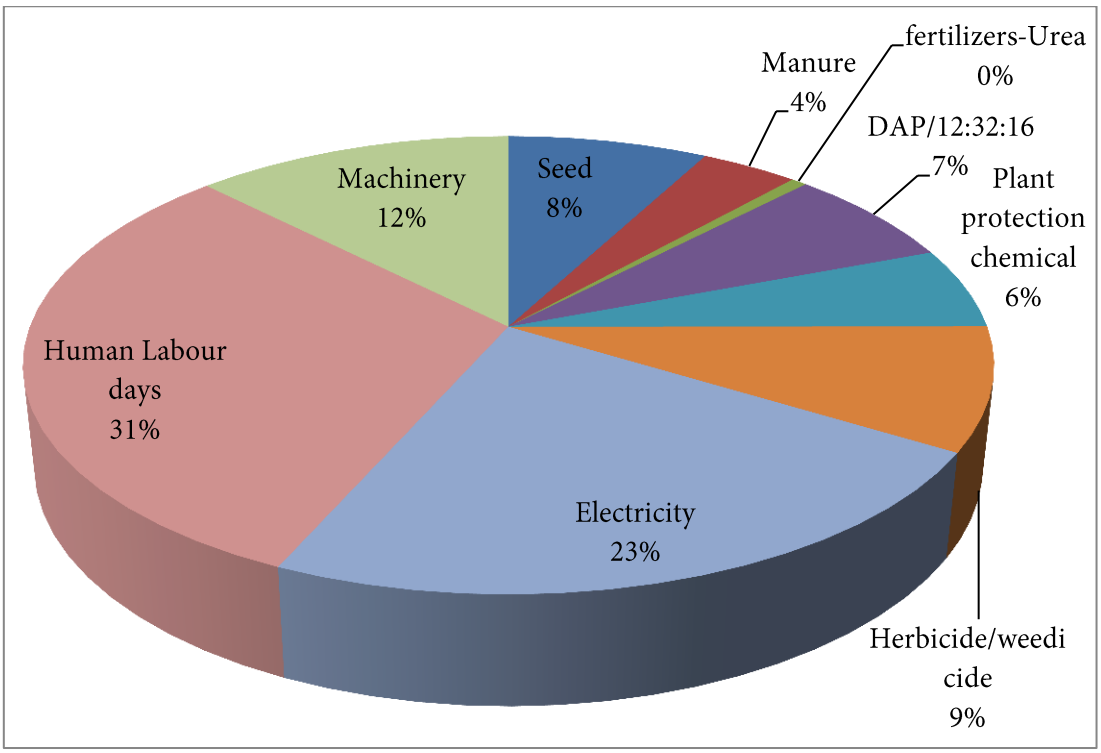

Fig. 4 6 :Per cent contribution of different components of cost of cultivation(Grain Production-Soybean- Total Paid-Out Cost of Cultivation Rs. 20423/-)

Amongst, different components of cost of cultivation (paid out cost) of grain production, the highest cost was found to be incurred in human labour (31%) followed by machine hrs (12%), manure (4%), electricity (23%), DAP fertilizer (7%), seed (8%), plant protection chemicals (6%) and herbicide/weedicide (9%)(Fig 3.6).

4.3 Technological Adoption regarding Quality Seed Production

The technological adoption in quality seed production with respect to sowing time, sowing method, row to row & plant to plant distance, depth of sowing, seed treatment with fungicide, rouging & weeding etc. across wheat, gram and soybean seed producers is presented in Table 3.11. It is observed from the data that cent per cent wheat seed producers used to perform line sowing method of cultivation. The more than 90 per cent wheat growers used to adopt row to row and plant to plant distance, proper sowing of depth, treated their seed with fungicides, perform rouging, weeding and getting subsidies, while 80 per cent perform timely sowing of wheat for cultivation of quality seed production. In case of gram more than 90 per cent of selected gram growers used to perform timely sowing (92.5%) through line sowing method at proper sowing depth and around 90 per cent were found to

follow row to row (87.5%) and plant to plant distance (87.5%) and treat the seeds with fungicides (87.5%). The 72.5 per cent of selected gram grower were found to perform rouging & weeding for cultivation of quality seed production. It is also noticed that only 5 per cent of them were reported to get subsidy for production of quality seed of gram.

Table 4. 5: Technological adoption regarding quality seed (%HHs)

Particulars		Seed producers related to		
		Wheat	Gram	Soybean
Sowing Time	Early Sowing	7 (17.5)	3 (7.5)	5 (12.5)
	Timely Sowing	32 (80)	37 (92.5)	35 (87.5)
	Late Sowing	1 (2.5)	0 (0)	0 (0)
Sowing Method	Ridge Farrow	0 (0)	0 (0)	5 (12.5)
	Ridge Bed	0 (0)	0 (0)	0 (0)
	Line Sowing	40 (100)	40 (100)	35 (87.5)
Row to Row distance		36 (90)	35 (87.5)	30 (75)
Plant to Plant distance		36 (90)	35 (87.5)	30 (75)
Depth of Sowing		36 (90)	38 (95)	30 (75)
Seed Treatment with fungicide		38 (95)	35 (87.5)	39 (97.5)
Rouging and Weeding		38 (95)	29 (72.5)	31 (77.5)
Subsidy on seed		36 (90)	2 (5)	4 (10)

In case of soybean, the majority of respondents were found to be reported that they use seed treatment with fungicides (97.5%), sow the seeds timely (87.5%), adopted line sowing of method (87.5%), rouging & weeding (77.5%). The majority of them were found to follow row to row and plant to plant distances (75%) and maintain proper depth of sowing (75%). It is also noticed that only10 per cent of them were reported to get subsidy for production of quality seed of soybean**.**

4.4 Parameters for quality seed production

The parameters regarding quality seed production being followed by wheat, gram and soybean seed producers are presented in Table 3.12. As for as parameters followed for quality seed production by wheat seed producers are concerned, all of them reported that they used to maintain moisture content at the time of storage and at the time of harvesting (90%). The majority of them were also supplied sample for soil testing (55%) and 63.64 per cent of them received SHC before time of sowing. The 78.57 per cent of respondents who received SHC adopted recommended doses of fertilizer as per SHC. Only 40 & 22.5 per cent of total respondents reported that they maintained isolation distance and performed seed germination test before sowing of seed for cultivation of quality seed production of wheat. Only 5 per cent of respondents related to quality seed producer of wheat that their seed lot was rejected for the next three years.

Table 4. 6: Quality parameter regarding quality seed production (% respondents)

Activities	Wheat	Gram	Soybean
Soil Testing			
Sample Supplied for Testing	22 (55)	10 (25)	31 (77.5)
Received SHC	14 (63.64)	3 (30)	12 (38.71)
Adoption of Recommended Doses of Fertilizers	11 (78.57)	3 (100)	8 (66.67)
Adoption of Processor of quality seed production			
Maintain of Isolation Distance	16 (40)	25 (62.5)	22 (55)
Testing of Seed Germination	9 (22.5)	10 (25)	27 (67.5)
Rejection of seed lot for next 3 year	2 (5)	3 (7.5)	3 (7.5)
Maintain of Moisture Content at the time Harvesting	36 (90)	39 (97.5)	33 (82.5)
Maintain of Moisture Content at the time Storage	36 (90)	28 (70)	37 (92.5)

Figure in parenthesis show percentage to total number of sample respondents (n=40)

In case of gram it was found that the only 25 per cent of respondents were supplied sample for soil testing and 30 per cent of them received SHC before time of sowing. The 100 per cent of respondents who received SHC adopted recommended doses of fertilizer as per SHC. The 97.5 & 70 per cent of respondents related to gram reported that they used to

maintain moisture content at the time of harvesting and at the time of storage, respectively. Only 62.5 & 25 per cent of total respondents reported that they maintained isolation distance and performed seed germination test before sowing of seed for cultivation of quality seed production of gram. Only 7.5 per cent of respondents related to quality seed producer of gram respondents that their seed lot was rejected for the next three years.

In case of soybean it was found that the 77.50 per cent of respondents were supplied sample for soil testing and 38.71 per cent of them received SHC before time of sowing. The 66.67 per cent of respondents who received SHC adopted recommended doses of fertilizer as per SHC. The 82.5 & 92.5 per cent of respondents related to soybean reported that they used to maintain moisture content at the time of harvesting and at the time of storage, respectively. Only 55.00 & 67.5 per cent of total respondents reported that they maintained isolation distance and performed seed germination test before sowing of seed for cultivation of quality seed production of soybean. Only 7.5 per cent of respondents related to quality seed producer of soybean respondents that their seed lot was rejected for the next three years.

4.5 Supervition by different Agencies

The supervision of seed plot of wheat, gram and soybean during sowing flowering maturity and harvesting stage was performed by officers of various agencies, which is presented in Table 3.13. The selected wheat seed producers were reported that the elected SPCSs officials visited at the time of flowering (82.5%) followed by harvesting (62.5%) maturity (25%) and sowing (25%) stages of cultivation of wheat. They were also reported that Assistant Seed Certification Officer (ASCO) was also visited their field at the time of flowering (62.5%) followed by maturity (42.5%) harvesting (37.5%) and sowing (7.5%) stages of cultivation of crops. The selected gram seed producers were reported that the elected SPCSs officials used to visited their field at the time of maturity (97.5%) followed by flowering (90%), harvesting and sowing (20 & 17.5%). The cent per cent respondents related to gram were reported that ASCO was also visited their field at the time of flowering and maturity, while only 5 per cent reported that ASCO visited their field at the time of sowing.

Table 4. 7: Supervition by different agencies officers

Activities	Wheat	Gram	Soybean
By-elected members of SPCSs			
Sowing	10 (25)	7 (17.5)	4 (10)
Flowering	33 (82.5)	36 (90)	38 (95)
Maturity	10 (25)	39 (97.5)	34 (85)
Harvesting	25 (62.5)	8 (20)	5 (12.5)
By-Assistant Seed Certification Officer			
Sowing	3 (7.5)	2 (5)	2 (5)
Flowering	25 (62.5)	40 (100)	39 (97.5)
Maturity	17 (42.5)	40 (100)	38 (95)
Harvesting	15 (37.5)	17 (42.5)	11 (27.5)

The selected soybean seed producers were reported that the elected SPCSs officials used to visited their field at the time of flowering (95%) followed by maturity (85%), harvesting and sowing (10 & 12.5 %). The 97.5 and 95 cent per cent respondents related to gram were reported that ASCO was also visited their field at the time of flowering and maturity, while only 5 per cent reported that ASCO visited their field at the time of sowing stage of cultivation of soybean.

4.6 Farmers' perceptions

The perceptions of seed producer's regarding quality seed production related to wheat, gram and soybean were found to be same with minor variation therefore these are pooled and presented in table 3.14. it is observed from the data that the majority of respondents strongly aggree with opinion to cultivation of quality seed as these provides high price, high yield, easily availability of seed of latest improoved varieties for the current and next year, easily availability of critical input as per requirement by the SPCSs, easy availability of seed of latest on improoved varities at the time of sowing at free of cost, ease in marketing of produce, latest technological knowledge of crops grown for seed production as well as other crops is easily accessable and payment of produce on time by the SPCSs. Apart from this the majority of respondents also reported that they can also have an additional benefits

along with the seed programme such as; soil health is maintained, technological knowlwdge of growing of different crops is gained drudgery is reduced with the help of various machine and equipment provided by the societies.

Table 4. 8: Farmer' perceptions regarding quality seed production (%)

Particulars	Strongly agree	Agree	Indifferent/ Neutral	disagree	Strongly disagree	Average
	1	2	3	4	5	
High Price realization	93.33	6.67	0.00	0.00	0.00	4.93
Easy availability of seed of latest of improved varieties at the time of sowing on free of cost	71.67	18.33	3.33	3.33	3.33	4.52
Availability of latest Improved verities of seed for next season	75.00	13.33	1.67	3.33	6.67	4.47
High yield realization	90.00	8.33	1.67	0.00	0.00	4.88
Latest improved variety of seeds are easily available	81.67	11.67	3.33	1.67	1.67	4.70
Latest technological main as well as other crops is easily available	68.33	25.00	1.67	1.67	3.33	4.53
Inputs for cultivating seed by the society as per requirements are easily available	73.33	21.67	1.67	1.67	1.67	4.63
Soil Health is maintained as per soil Health Card by the Society	63.33	20.00	5.00	6.67	5.00	4.30
Ease in Marketing	70.00	16.67	5.00	5.00	3.33	4.45
Timely Payment of produce (Seed)	66.67	15.00	1.67	8.33	8.33	4.23
Reduce in drudgery due to use of machinery and equipment	68.33	25.00	1.67	1.67	3.33	4.53

The only less than 10 per cent respondents were found to be disagree and strongly disagree across these perception. The mean value of the likert scale was found to between 4.23 to 4.93 proved that the majority of farmers were agree and strongly agree with these perceptions.

4.7 Constraints in adoption of Improoved Seed Production Technology

The constraints in adoption of improved seed production technology by the respondents are presented in Table 3.15. It is clear from the data presented in table that the majority of the respondents reported that unavailability of seed testing report on time i.e. before sowing (100%) followed by insufficient quantity of seed as per requirement (98%), unavailability of desired type (Breeder/Foundation) of improved HYVs of seed (95%), unavailability of desired improved HYVs of seed (92%), unavailability of subsidy for quality seed production (87%), refusal of undersize seed after selling and return to seed producers by

the SPCSs (78%), low germination as reported on the bag (77%), unavailability of skilled labours at the time of peak operational periods (75%), lack of awareness of isolation distance maintained for quality seed production (71%) and mechanical impurity in production of quality seed (65%).

Table 4. 9: Constraints faced by producer members and SPCSs in quality seed production

S.No.	Particulars	%
Related to Producer members		
1	Unavailability of desired type (Breeder/Foundation) of improved HYVs of seed	95
2	Unavailability of desired improved HYVs of seed	92
3	Unavailability of skilled labour at the time of peak operational period	75
4	Insufficient quantity of seed as per requirement	98
5	Unavailability of seed testing report on time i.e. before sowing from Department of Agriculture	100
6	Lack of awareness about isolation distance maintained for quality seed production	71
7	Low germination as compared to reported in the bag	77
8	Mechanical impurity in production of quality seed	65
9	Unavailability of subsidy for quality seed production on time	87
10	Refusal of undersize seed after selling to the SPCSs and return to seed producers	78
Related to SPCSs		
1	Lack of coordination with state seed supply institutions regarding distribution of quality seed	83
2	Complicated process for formation of society (more documentation, renewal of society every year, time consuming etc.)	67
3	Boundation of sale of seed with in the district	67
4	Breach of promise by Agricultural Department on holding of seed in the society	67
5	Unavailability of subsidy for quality seed production from last 3 years	83
6	Breach of promise by Primary Agriculture Marketing Society on used to return quality seed to SPCSs, if not sold by them	50
7	If market price is more than procurement price, producers bound to sold the quality seed in open market	33
8	Delay in payment of seed procured by Department of Agriculture	67

lack of coordination with state seed supply institutions (83%) followed by unavailability of subsidy for quality seed production from last 3 years (83%), complicated process for formation of society (more documentation, renewal of society every year, time consuming etc.) (67%), boundation of sale of seed with in the district (67%), breach of promise by Agricultural Department on holding of seed in the society (67%), delay in payment of seed procured by Department of Agriculture (67%), breach of promise by Primary Agriculture Marketing Society on used to return quality seed to SPCSs, if not sold by them (50%) and if market price is more than procurement price, producers bound to sold the quality seed in open market (33%) were the major constraints of SPCSs in quality seed production.

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CHAPTER-V

CONCLUSIONS AND POLICY IMPLICATIONS

This chapter deals with the conclusions drawn from the findings of the study and suggestions emerged from the conclusions.

5.1 Conclusions

The following conclusions emerged from the finding from the study:-

- The majority of Quality Seed Producers (QSPs) were found to be educated above high school (92.5%) belongs to general and OBC caste categories (97.5%) and all of them involved in primary as well as secondary occupation. Half of the family members were found to be engaged in farming.
- The total land of QSPs was found to be under cultivation out of which more than 75 per cent was under irrigation with cropping intensity of approximately 200 per cent with higher being of in case of QSPs of wheat (246.88%) followed by gram (200.00%) and soybean 193.00%)
- The breeder and foundation seed of wheat, gram and soybean were found to be distributed to quality seed producers by SPCSs. (i) GW 322, GW 451, HI 1634 and Tejas HI 8759 of latest developed varieties of wheat was found to be distributed to 52.5, 40, 2.5 & 15 per cent of producer members by the SPCSs. An average producer of wheat was found to consume 17.55, 12.35, 2.00 & 5.83 kg breeder seed of these varieties, respectively for cultivation of quality seed production of wheat at his farm. (ii) RVG 202 was found to be a latest developed variety of gram distributed amongst all the gram growers by the SPCSs for production of quality seed of gram in the area under study. An average gram producer was found to consume 3.42 kg breeder seed of RVG 202 in his farm. (iii) In case of soybean breeder seed of RVS 104, JS-20-29 & JS-95-60 as well as foundation seed of JS-95-60, RVS-2011-04, JS-20-34 & JS-93-05 of latest developed varieties were found to be distributed amongst the producer members. The 2.5 per cent of breeder seed of each variety was found to be distributed among the producer members for quality seed production of soybean. As regards to foundation seed, the maximum seed was found to be distributed of variety JS-95-60

(70%) followed by JS-20-34 (12.5%), RVS-2011-04 (10%) & JS-93-05 (5%) by the SPCSs. The quantity of these varieties distributed to seed producer was found to be raged between 1.20 (JS-20-29) to 6.83 (RVS-2011-04) kg per soybean seed producer.

- The cultivation of quality seed production was found to be profitable business over grain production as quality seed producers obtained more than Rs. 1.00 income over the additional investment of Rs. 1.00, which was found to be more in case of wheat (Rs.8.81) as compared to soybean (Rs.1.51) and gram (Rs 1.17). Although, the cost incurred in seed, labour (human & machine) and plant protection chemicals was found to be more in quality seed production as compared to grain as the quality seed production is costly affair as the purity and vigour is require to be maintained by the producers.
- The cultivation of quality seed production of wheat was found to be more profitable as compared to gram and soybean as quality seed producers obtained maximum per Rs. Return over the investment of Rs. 1.00. which was found more in case of wheat (3.19) as compared to gram (2.03) and soybean (1.22).
- The cost of production in quality seed production was found to be more in case of seed as compared to grain by 50.62, 17.43 and 22.22 per cent in case of wheat, gram and soybean, respectively.
- The majority of quality seed producers use to adopt all the advance technologies viz. timely sowing (>80%), line sowing (>90%), maintained plant geometry (row to row-plant to plant distance and depth of sowing) (>75%), seed treatment and fungicide (>87.5%) and rouging & weeding (>72.5%) in cultivation of wheat, gram and soybean.
- The majority of quality seed producers also used to maintain moisture contain at the time of harvesting and storage (>70%), while isolation distance, testing of seed germination were found to be adopted by more than 40 and 22 per cent quality seed producers, respectively. The seed lot of more than 93 per cent quality seed producers was never found to be rejected by the Seed Certification Agency.
- The supervision is being carried out by the elected members of SPCSs and seed certification officers at sowing, flowering, maturity and harvesting stage of the crops. The majority of quality seed producer reported that supervision was done very

frequently at the time of flowering and maturity as compared to sowing and harvesting stage of cultivation of crops.

- The more than 90 per cent respondents strongly aggree with opinion that the cultivate the quality seed over the grain as it provides high price, high yield, easily availability of seed of latest improoved varieties for the current and next year, easily availability of critical inputs as per requirement from the SPCSs, seed of latest improoved varities at the time of sowing at free of cost, ease in marketing of produce, latest technological knowledge of the crops for which seed programme is taken as well as other crops is easily accessable and payment of produce on time by the SPCSs. Apart from this the majority of respondents also reported that thay can also have an additional benefits along with the seed programme such as soil health is maintained, technological knowlwdge of growing of different crops is gained drudgery is reduced with the help of various machine and equipment provided by the societies.
- The majority of the respondents reported that unavailability of seed testing report on time i.e. before sowing (100%), insufficient quantity of seed as per requirement (98%), unavailability of desired type (Breeder/Foundation) of improved HYVs of seeds (95%), unavailability of desired improved HYVs (92%), unavailability of subsidy for quality seed production (87%), refusal of undersize seed and return to producers after selling to the SPCSs (78%), low germination as reported in the bag (77%), unavailability of skilled labours at the time of peak operational periods (75%), lack of awareness of isolation distance maintained for quality seed production (71%) and mechanical impurity existed in production of quality seed (65%).
- Lack of coordination between SPCSs and state seed supply institutions (83%), unavailability of subsidy for quality seed production from last 3 years (83%), complicated process for formation of society (more documentation, renewal of society every year, time consuming etc.) (67%), boundation of sale of seed with in the district (67%), breach of promise by Agricultural Department on holding of seed in the society (67%), delay in payment of seed procured by Department of Agriculture (67%), breach of promise by Primary Agriculture Marketing Society on used to return quality seed to SPCSs, if not sold by them (50%) and if market price is more

than procurement price, producers bound to sold the quality seed in open market (33%) were found to be the major constraints faced by the SPCSs in procurement and marketing of quality seed production.

5.2 Policy Implications

Looking to the conclusions of the study, it seems that there is lack of coordination between seed producing institutions (SAU, KVK, ZARS, RARS, Agricultural Department farms etc) and SPCSs due to which the desired type of seed (Breeder, Foundation and Certified) and HYVs of crops are not available in sufficient quantity as per requirement of the member farmers. At the same time very precious input i.e. seed was found to be sold in the open market as the price of different type of seed are not fixed by the State Government. Some time when the price of grain was more than the market price of seed, it was found that the producer sold out seed as a grain in the open market. Inspite of investing in research for the good cultivars, it is not being distributed amongst the farmers those who are in need. The distribution efficiency is also found to be lacking and technology is not being penetrate vertically as well as horizontally due to which the diffusion of technology lagging behind without exploiting its fullest potential level.

Therefore, it become imperative to bring radical changes for bringing harmony in production, procurement and distribution of quality seed across all the stake holders with ensuring proper diffusion of technology at minimum possible time. The policy initiative which are emerge from the conclusions of the study are as follow:-

I. The web portal on production, procurement and distribution of seed involving all the stakeholders is required to be launched in the State, which covers all the informations of seed, varieties, quantity available, sources, price, type and availability of seeds along with ensuring door step delivery.

II. It was found during the investigation that at the time of procurement the price of different type of seeds (Foundation-I, Foundation-II, Certified-I, Certified –II etc) of different varieties of crops remain almost same. There is no discrimination across various types of seed. Hence, it is required to fix price of different type of seed by the State Government before sowing of the crops.

III. Looking to the breach of promises by the Department of Agriculture and Primary Agriculture Marketing Society with SPCSs there is a problem in distribution of seed. Therefore some legal framework should require to be developed to ensure existence of these societies for the development of agriculture and farming communities.

IV. Although subsidy was found to be provided for production of quality seed but not available in time hence, the subsidy on quality seed to the farmer as well as SPCS should be ensured at the time of procurement with signing legal documents between the Societies and Department of Agriculture.

V. It is also found during the observation that the seed quality testing is performed by two agencies i. e. i-Seed certification agencies and ii-Department of Agriculture. However, seed quality testing report from the Department of Agriculture is generally made available after sowing of the crops which create hindrance in the quality seed production. Therefore, the report of seed quality testing should be made available before sowing of crops.

VI. The seed are very precious input which require on continuous basis. Therefore the payment of seed procured by the Agriculture Department from the SPCSs is required to be done on priority basis in time.

VII. The credit should be made available at low rate of interest for creation of infrastructure facilities (Grading, Packaging, Warehousing etc.) and to strengthen the SPCSs for their long term viability.

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