Chapter One
Chapter - One

Introduction And Research Design

The history of agricultural progress coincided with the history of new crops and varieties brought under cultivation. The process passed through some significant stages;

i. The cultivation of indigenous but useful plants and those brought from foreign countries.

ii. Selection of superior types from cultivated plants.

In due course many useful selections were made and there was a gradual but steady progress in crop improvements. However new vistas were opened up with the advent of sciences of genetics and plant breeding. This enabled man to manipulate the genetic composition of varieties to his advantage. The scientists have been making available new and better varieties of seeds to the farmers through well known techniques of selection, hybridization and poly ploidisation.

Genetic variability provides the raw materials for continuous advances in biological productivity\(^1\). A series of improvements in yield potential was rendered possible in rice through the use of new genetic material\(^2\).


Genetic resources have become immeasurably more important with the advent of biotechnology. Biotechnology alone would account for 50 to 60 percent of the global economy in the next three decades.

The farmers in developing countries have three major sources of seeds:

i. Seed purchased from seed industry

ii. Seed obtained from other farmers and

iii. Seed retained from previous years' grain crop.

More than 85 percent of the seed used in India is produced by the farmer himself. The farmers in agriculturally developed state of Punjab use self retained seed to the extent of about 80 percent in the case of wheat, 62 percent in the case of paddy, 55 percent in case of cotton (A) 59 percent in case of rape seed and mustard and 91 percent in case of potato.

Fellow farmers constitute the next important source of seeds. The quality of seed obtained from this source is assuring because farmers often resort to barter exchange system. Further seeds obtained from fellow farmers did not involve any transport cost and they do not insist on immediate cash payment.

---

3 Sahai Suman: Patenting of Genetic Resources. The case of Developing Countries, Indian Farming Vol 43(7) 1993 PT-12.
The seeds obtained from the seed industry account for a meager share in the total seeds supply to farmers on account of high price of certified seeds and their non availability in terms of proper place and time. It is also maintained by the farmers that there is no significant yield differences between certified and self retained seeds of various crops. This view has been responsible for the large majority of Indian farmers continuing to use self retained seeds. Indian seed industry is basically a cereal based industry. There is also the other aspect that there is very slow degeneration in the quality of seed in the case of self pollinated crops like wheat paddy etc.

Seeds Research and Development Programme. Indian Council of Agricultural Research is the apex organization for sponsoring coordination and promoting plant breeding research in India. There are 27 Agricultural Universities with strong base of agricultural research including plant breeding and genetics. There are 20 national research centers and 70 All-India Coordinated Research/ Improvement Projects. It is mentioned that 2078 high yielding varieties of different crops had been released/ notified in India by the end of 1993 under section 5 of the seeds Act 1966. Thus the public research institutes/ organizations have been playing a crucial role in India in terms of seed development and distribution.

ICAR has set up National Bureau of Plant Genetic Research in New Delhi in 1976 in view of the importance of plant genetic resources in crop improvement and the urgent need for the collection and conservation of
genetic diversity for current use and for the posterity. The Bureau has been establishing growing linkages with crop based Institutes, National Research Centres and Agricultural Universities. The National Bureau of Plant Genetic Research has 12 regional station based centers/ research farms providing access to most representative agro-climatic regions of the country for collection evaluation, conservation and distribution of plant genetic resources.

**Crop Improvement Programmes – India’s Achievements**

India’s achievements in crop improvement programmes have been impressive. They have been acknowledged not only in India but in many of the developed and developing countries. This is evidenced by cultivation of some of our high yielding varieties and hybrids at the global level. India’s short duration and high sucrose varieties of sugar cane are in cultivation in more than 25 countries of the world \(^5\). India has the distinction of developing the first cotton and pear millet hybrids in the world. Development of regular bearing hybrids in mango high yielding varieties of coconut, cashew nuts, areca nut and grapes are some of the classical examples of research achievements in horticulture and plantation crops. India has developed a strong foundation of research on plants and genes.

**Seed Sales–Global and Indian Perspective**

Sale of improved seeds is highly concentrated in the western industrialized countries

A major share of the trade is in the hands of 26 multinational seed companies out of which five each are from USA, and Netherlands, seven from Japan, two each from Switzerland, Germany and Japan and three from England.\textsuperscript{6} Important seeds exported from USA to developing countries are hybrid corn and sorghum, fodder crop seeds, seeds of soyabean and vegetables. Exports of seeds from Europe consist of almost 50 percent of vegetable seeds. It is estimated\textsuperscript{7} that the exports of seeds of basic food crops (rice, wheat and pulses) from the industrialized countries are still very low, less than two percent of the total seed exports to developing countries.

Indian seed industry is cereal based with a turnover of about Rs.2500 crores comprising mainly wheat and paddy seeds. Total certified /quality seed distributed in India was 73.27 lakh quintals in 1996-97 of which share of wheat seed was about 32 percent, paddy about 23 percent, other cereals 9 percent, pulses 6 percent oil seeds 17 percent, cotton 4 percent and potato seed 9 percent. It is significant to know that the multinational seed companies have little interest in these crops due to large volume and low value.

\textsuperscript{6} Sidhu.M.S: Oppcit p 141
Seeds Requirements in India

The gap between seeds requirement and supply in India is quite substantial and the Seed Multiplication Ratio (SMR) was low. The SMR is only 1:4 for potato in comparison to 1:100 for rapeseed and mustard, 1:80 for paddy, 1:50 for cotton and 1:70 for wheat. The SMR of potato was the lowest and the gap was 91.77, 92.86 and 92.73 percent during 1995-96, 1996-97 and 1997-98 respectively. Similarly for wheat which has a low SMR the gap was 64.16, 66.38 and 67.48 percent during these three years respectively.

The SMR was very high for rapeseed and mustard where the gap was 21.10, 6.42, 19.49 percent during 1995-96, 1996-97 and 1997-98 respectively. The gap was about 58 percent in 1995-96, around 49 percent in 1996-97 and nearly 45 percent in 1997-98 respectively for paddy. The gap for cotton was about 48,38 and 43 percent during the three respective years. The high gap between the requirement of certified/quality seeds and its distribution in the country is a matter that requires serious attention. The public and private seed agencies lack adequate facilities/infrastructure in this regard.

The entry of MNCs in the Indian seed industry will provide healthy competition. The farmers will get adequate supply of certified seeds to give a boost to the agricultural production in the 21st century.
Need For The Study.

The present study has been selected for an in depth analysis of the growth perspectives and prospects for the seed industry in general and in the Haveri district in particular. It is obvious that India has abundant plant breeding skills. Coupled with the agro-ecological diversity and the ingenuity of the farmers, it will be possible to develop a vibrant seed industry that not only meets domestic demand but also makes India a player in the world seed trade. It is estimated that Indian agricultural production can increase by 15 percent to 20 percent if high quality seeds are more widely available. Besides India can then capture 25 percent of the world seed market 8.

The seed industry in India is beset with certain problems both in production and marketing. A major problem in this field relates to the absence of a system for investment in plant breeding. Consequently investment in the seed industry is confined to hybrid seeds, high yielding varieties of ornamental and horticultural plants. Private investment needs to be attracted towards cereal crops. The supply of high yielding quality seeds is the most crucial prerequisite for promoting a vibrant agricultural economy.

The seeds market is beset with problems of delayed payment to seed farmers by the seed companies. The delay is much larger than the private

---

buyers (commission agents) of other agricultural commodities. It is learnt that delay in payment for the sales of seeds by the farmers to the seed companies extends up to an year or even longer. This would cause lot of hardship to authorized seed growers of the concerned seed companies. Another marketing problem faced by the seed manufacturers is the substantial quantity of seeds rejected by the companies at the time of grading. This too would put the seeds growers to a substantial amount of loss. The seeds companies have been following unilateral policy of deciding the price of the seeds purchased from the seeds growers without involving the latter in the process of pricing. These and other marketing problems of hybrid seeds in the study areas led to the selection of the topic for the present study.

**Statement of the Research Problem**

In view of the issues involved and the significant role of hybrid seeds farming in the study area the choice of the present study "Hybrid seeds Production and Marketing A Case Study of Haveri District" has been made by the researcher.

**Scope and Objectives of the Study**

The present study covers a wide spectrum of issues involved in the production and marketing of high yielding hybrid seeds in the study area. The two interrelated aspects of production and marketing of seeds have been performed by the farmers and the concerned seeds companies. Hence a comprehensive study of the problems and prospects of the seeds production
and marketing at both the levels farmers and seed companies has been attempted here. The study has been conducted with the following specific objectives.

1. To analyze the various aspects of production of seeds by the farmers covering the areas of nature and pattern of production.

2. To assess the financial and manpower involvement by the farmers in the production of seeds.

3. To estimate production costs and productivity of the seeds farming at the farmers level.

4. To appraise the financial, training and technical facilities provided by the seeds companies to the farmers.

5. To make quantitative assessment of seeds production during the 5 year period from 1995-96 to 1999-2000 and to examine the infrastructure facilities and the government incentives extended to the seed farmers.

6. To make an appraisal of the various marketing mix and marketing infrastructure for the marketing of seeds by the farmers and the seed companies.

7. To examine the important marketing functions of assembling, grading, branding, weighting, packing and transporting both at the farmers and at the companies level.
8. To analyze the pricing and the marketing costs and marketing problems at different levels.

9. To study the channel of distribution, financing of the marketing operations and other related marketing aspects germane to the research topic.

**Hypotheses of the study**

The following hypotheses have been assured for the present research study.

1. Availability of suitable climate and skilled labour are mainly responsible for qualitative production of hybrid seeds.

2. The price of seeds offered to the seeds farmers is not commensurate with increase cost of input.

3. Delayed in the payment to the farmers by seeds companies is due to over supply of hybrid in the market.

4. The training and technical assistance to farmer has ensured quality standards and production efficiency.

**Methodology of Data Collection**

The study is an empirical investigation of seeds farming and marketing in the district of Haveri. The area covers five talukas of the district viz. Haveri, Ranebennur, Hangal, Hirekerur and Bydagi. Where the seeds farming is carried on an extensive scale. The primary data is collected from 100 seed farmers spread over the selected 5 talukas. The farmers are selected at...
random and 20 farmers are chosen from each taluka giving due weightage to
the farms of different sizes and the selected farmers are duly categorized
under big, medium and small farmers.

The selecting of the talukas, villages and the farmers has been
indicated in the following table.

Table No. 1.1 Selection of Talukas, Villages and Farmers

<table>
<thead>
<tr>
<th>S.No</th>
<th>Talukas</th>
<th>No of Villages</th>
<th>No of Farmers In Each village</th>
<th>Total No of Farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Haveri</td>
<td>5</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Ranebennur</td>
<td>5</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>Hirekerur</td>
<td>5</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>Byadagi</td>
<td>5</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>5</td>
<td>Hangal</td>
<td>5</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>25</td>
<td>20</td>
<td>100</td>
</tr>
</tbody>
</table>

Table No. 1.2 Names of the Selected Villages

<table>
<thead>
<tr>
<th>Talukas</th>
<th>Names of Villages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haveri</td>
<td>Karagi, Devgiri, Kallapur, Hirelingadahalli, Kurubgonda</td>
</tr>
<tr>
<td>Ranebennur</td>
<td>Sunkalbidri, Hediyal, Guddadbenalli, Belakeri, Joisaraharalhalli</td>
</tr>
<tr>
<td>Hirekerur</td>
<td>Kunchur, Hosalli, Buradikatti, Makri, Lingaddevarkoppa</td>
</tr>
<tr>
<td>Byadagi</td>
<td>Kadarmandalagi, Sidenur, Bannimatti, Masanagi</td>
</tr>
<tr>
<td>Hangal</td>
<td>Akkialur, Adur, Alakpatti, Kudal, Tilavalli</td>
</tr>
<tr>
<td>Total</td>
<td>25 Villages</td>
</tr>
</tbody>
</table>

The data is collected through two types of pre-tested questionnaire
schedules one for the seed farmers and the other for the seed companies
sponsoring the concerned seeds farms. The data has been collected
personally from the farmers through personal interviews and the answers
have been recorded by necessary counter checking to ascertain the factual information needed for the study. The information is collected in a property structured performa to enable the researcher for further scientific processing and tabulation in order to derive appropriate inferences.

The information from the seed companies has also been obtained through specially prepared questionnaire and also through personal discussions with the officials of the seed companies. Secondary data has been collected from the publications on the seeds farming and marketing. The published literature was obtained from the government offices, University of Agricultural Sciences Dharwad and from the offices of the seeds companies. The other sources from whom the secondary data has been collected are:

1. District Agricultural Office Haveri.

2. District Horticultural Office Haveri

3. Office of Assistant Directors of Agriculture at Haveri, Ranebennur, Hangal, Hirekerur and Bydagi.

4. Office of Tahasildar at Haveri, Ranebennur, Hangal, Hirekerur and Bydagi.

5. District Statistical Office Haveri

6. Karnataka State Seed Certification Agency Office Haveri and Ranebennur

7. Karnataka State Seeds Corporation Ltd Ranebennur

8. Agricultural Research Station Hanumanamatti
The data collected from the primary and secondary sources has been processed and tabulated in scientifically prepared tables. The interpretation of the data has been accomplished using the simple qualitative statistical techniques and the necessary inferences have been drawn accordingly. Graphical representations based on the statistical data have been provided to focus on some of the important trends and economic parameters. The data has been interpreted and inferences have been drawn with relevant theoretical explanations wherever necessary.
Review of Literature

A good number of published research works on the subject are available. However some selected research works have been reviewed here.

M.S. Sidhu

The study on "Impact of World Trade Organization on the Indian Seed Industry" by Prof. M.S. Sidhu is a brilliant work on the history and growth of seed industry in India and the impact of WTO on the same. He has rightly observed that through the well-known techniques of selection, hybridization and poly ploidisation the scientists have made available new and better varieties to the farmers. The author has mentioned that genetic variability provides the raw material for continuous advances in biological productivity. Mr. Sidhu has opined that more than 85 percent of the seed used in India is produced by the farmer himself. He opines that even under WTO regime Indian farmers continue to use self retained seeds.

The author has observed that India has developed a strong foundation of research on plants and genes. Analyzing the gap between requirement and supply of seeds the study has revealed that the gap is more where Seed Multiplication Ratio was low. He therefore observes that the entry of MNCs in the Indian seed industry will provide healthy competition and farmers will

---

get adequate supply of certified seeds to give a boost to the agricultural production in the 21st century.

Ganesan A.V 10

Discussing the significance of high yielding and hybrid seeds in his proper "Sowing seeds of Pragmatism". Mr. Ganesan has highlighted the possible impact of using quality seeds on Indian agriculture. He has observed that India has abundant plant breeding skills. He opines that coupled with the agro ecological diversity and the ingenuity of the farmers it will be possible to develop a vibrant seed industry that not only meets domestic demand but also makes India a player in the world seed trade. Mr. Ganeshan has predicated that India's agricultural production can increase by 15 percent to 20 percent if high quality seeds are more widely available. Besides India can then capture 25 percent of the world seed market.

Randhawa N.S 11

The author in his study on "Seed Programmes in India" has highly complimented India's progress in crop improvement programmes. He has rightly observed that our crop improvement programmes have been acknowledged not only in India but in many of the developed and developing

countries. He has mentioned cultivation of some of our high yielding varieties and hybrids at the global level. He has noted in his paper that our short duration and high sucrose varieties of sugarcane are in cultivation in more than 25 countries of the world.

K.K. Sigh, Mehmood Khan and M.S. Shekhawat

The authors have affirmed in their paper "Green Revolution-How Green Is?" that a new strategy was developed in the mid-60s whose main components are greater intensity of cropping, increasing use of agricultural inputs like high yielding varieties of seeds, water, fertilizers, pesticides and credit. They have mentioned that several institutions have been set up to ensure timely and adequate supply of inputs. A network of extension programmes has brought science and technology closer to the farmers. The tempo of agricultural production has been maintained because of the special drives that are launched to ensure timely and adequate supply of seeds and other inputs.

The new strategy according to the authors has been in the form of a package programme woven around high yielding varieties (HYV) and other inputs such as adequate irrigation, chemical, fertilizers, plant protection chemicals, mechanization of agriculture,

supply of electricity, credit and marketing facilities on cooperative basis and a system of superior prices and buffer stocking.

As part of green revolution the diffusion of HYV became fully operational in the country during 1965-66 in which about 17000 hectare of land was brought under HYV especially in the Plain and the Kaveri Delta.

The authors have however observed that HYVs have had a discriminatory impact and they are intensive in their use of input materials, especially irrigation, fertilizers and markets. They further observed that owing to these constraints, within a geo climatic setting, the large farmers and early adopters have been substantially benefited from the new seeds while the small and marginal farmers have been left behind.

Dr.A.Seetharam 13

Discussing the genetic potentials of the coarse cereals in his paper on "Waiting for Incentives" Dr.Seetharam has observed that the absence of technology transfer has limited the full exploitation of potentials available in the technology in this sector of agriculture. He opines that the present level of productivity of around 900 kg/ha of jowar, 700 kg/ha of bajra, 1500 kg/ha of maize, 1300 kg/ha of ragi and 450 kg/ha of small millets is only a third of the available genetic potential.

The components of improved technology consist of non-monetary inputs—optimum sowing time, plant stand, timely weeding and cultural management, low cost inputs—seeds of High Yielding Varieties, hybrids and high cost inputs—manures and pesticides. The author has maintained that coarse cereal growing farmers by and large have adopted only the non-monetary inputs and partly the adoption of HYVs/hybrids. The gains that have been made till now in productivity is the reflection of adoption of the above. The next quantum jump in productivity can be expected only through the adoption of cash inputs, besides better crop management greater coverage under HYVs and hybrids and balanced nutrition. Barring maize and jowar the coverage under HYVs in other crops is less than 30 percent. The author has pointed out that a large number of high yielding varieties/hybrids are available to all coarse cereal crops for selection according to season/situation. Recently a couple of superior hybrids suitable for cultivation in Kharif and rabi seasons have been evolved and released in jowar. Dr. Seetharam has mentioned that the development and release of early maturing hybrids and composites of bajra has imported the necessary stability to vast bajra growing tracts of Rajasthan. The release of more than 60 maize hybrids and composites at the national and state levels has brought in spectacular success in enhancing national production.
The main thrust of the paper "Vegetable Production in India - Need for a Total system Approach" by Sant Kumar and others is on improving the productivity and quality of vegetables. The authors have emphasized the following aspects:

i. Improvement and Development of infrastructure and processing facilities

ii. Increasing the production of hybrid seeds and good traditional varieties of seeds.

iii. Setting up of warehouses with cold storage facilities to preserve the material during glut seasons.

iv. Strengthening refrigerated facilities and

v. Providing of quick, efficient and cost effective transport systems.

The authors have further suggested for fixing floor prices for at least important vegetables for assuring remunerative returns for their investments.

---

Anindya Bhukta

The author has mentioned that the Uruguay Round Agreement (URA) has brought agriculture under the intellectual property rights of the WTO. The URA states that "parties shall provide for the protection of plant varieties by an effective sui generis system or by any combination thereof." An International Convention for the protection of New Varieties of Plants (UPOV) was adopted in 1960. All the developed countries have taken membership. The implications of this Convention of seed farming and trade on developed and developing countries have been highlighted by Anindya Bhukta in his study "Indian Agriculture Under WTO Regime". The author maintains that joining UPOV would be more disastrous to the farmers' right because the system is heading towards outright patents. Under UPOV Plant Breeders' Right is granted (PBR). PBRs do not entail ownership over the selling and marketing of a specific variety. Under an amendment in 1978 the UPOV placed some restrictions on the protected seed while providing two exemptions to PBRs-viz Farmers exemption and Research exemption. Under the former the farmers retain part of their harvest for subsequent planting as seed while the second one permits the breeders to use a protected variety in subsequent breeding experiments.

---

The author therefore opines that a patent protection to the intellectual properties in the agricultural sector is not desirable to a developing country like India where agriculture is not a commercial venture to the farmers, rather it is a livelihood for them. India has now a Protection of Plant Varieties and Farmers' Right Act to protect plant varieties and farmers' rights.

Harindra Kishor Misra

In his analysis of "Impact of WTO On Indian Economy" Mr. Misra holds the opinion that protection by patents in agriculture threatens to deprive farmers of their rights to produce, reproduce, modify, and sell seeds. He has pointed out that in India, farmer-to-farmer sales meet nearly 60 percent of the total annual seed requirement. He has contended that the international convention for the protection of New Varieties of Plants (UPOV) gives the breeder monopoly rights over his variety via his seed trade and breeders. The farmers' exceptions give farmers the right to save their own seeds. However, the amendment of UPOV in 1991 has taken away these exemptions. The farmer pays royalties to the patent holder. The Indian Patent Act 1970 does not recognize any form of intellectual property rights in the area of biodiversity.

The paper "Input Use Efficiency in Indian Agriculture: A Study of Vegetables and Oil Seeds" by Balerao and others is devoted to a study of the input use efficiency of seeds, fertilizers, insecticides, human labour and irrigation. The authors have made use of Cobb-Douglas production function fitted to the data obtained from four unpublished PhD thesis for nine vegetables, rain fed and irrigated ground nut and mixed and pure mustard. The efficiency of input use is studied by estimating marginal value productivity marginal cost ratios. The results indicate negative values for all the crops except mustard and over use or misuse of seed, fertilizer and irrigation for some of the vegetables. MVP-MC ratios which are mostly greater than unity in vegetables and irrigated groundnut for most of the inputs indicate their efficient use and less than unity for some of the vegetables, rain fed groundnut and pure mustard indicate less than optimum use. There is need for policies favouring concentration on timely and adequate supply of all these inputs including technical know how at reasonable cost.

K.Sain

The study is an analysis of "Relative Efficiency of Input Use Cultivation of some Food Crops and Commercial crops". The author has examined net returns per unit of cost and responses of yields to the use of inputs in the cultivation of some principal crops in India. The author has also studied returns per unit of cost and responsiveness of yield to addition of inputs for some predominantly commercial crops. Finally the relative contribution of some major farm inputs to production of farm output is examined. Estimates of total revenue, total cost, return-cost ratio and rates of return reveal higher profitability in the cultivation of commercial crops like potato, poppy seed and ground nut than in the cultivation of predominantly food crops like local amen paddy (winter), High Yielding Variety Paddy (summer) and wheat. Per hectare yield of commercial crops were better than those of the foods to the use of inputs. The author has observed "Substantially positive and higher marginal productivities of innovative of farm inputs of the mechanical, chemical and biological groups, than the same for their traditional counterparts warrant more allocation, or reallocation of the farm economy through superior input use efficiency and larger farm output of higher quality per unit of money invested in farming".

---

18 K.Sain: Relative Efficiency of Input Use in the Cultivation of Some Food Crops and Commercial Crops. Indian Journal of Agricultural Economics. Ibid p491
A. K. Kosta and M. R. Chandrakar

The authors have made a study of "Profitability of vegetable Crops In Chattisgrah Region of Durg District". The study has revealed that the cropping intensity of small and large vegetable farms was 204 and 176 percent respectively. The small farms allocated more percentage of gross cropped area in rabi and summer, where as the large farms have more cropped area during Kharif. The cost of production per quintal was maximum for lady’s finger and the minimum for ivy-gourd. The labour cost was more in all vegetables except tomato than in other crops. Bottle gourd and cabbage are heavy feeder of nutrients, therefore the percentage of input cost was maximum for fertilizers/manual. Marketing cost was maximum in ivy-gourd (39 percent) and minimum in lady’s finger (19pc). However the total production cost of vegetables on per quintal basis showed reverse trend. The cost benefit ratio was the highest in cabbage and lowest in lady’s finger. The returns from ivy-gourd, cabbage and bitter gourd were comparatively higher than those from other crops on per hectare basis, where as per quintal returns are found to be high in the case of bitter gourd, cucumber, cauliflower and cabbage. The authors have suggested that the percentage of area allocated to the letter group of crops including tomato should be increased and that under brinjal and lady’s finger should be reduced for maximizing the profits.

The authors have identified the following as the main constraints for the development of vegetable crops.

i. Poor quality of seed
ii. Lack of knowledge of scientific farming
iii. Imbalance in the use of fertilizers
iv. Wrong selection of marks of pesticides
v. Scarcity of hired labour
vi. Lack of storage facilities
vii. Absence of regulated markets
viii. Non-availability of adequate credit for acquiring infrastructure in vegetable farms and
ix. Malpractices in the marketing of vegetables.

Padma Ramachandran

Padma Ramachandran has narrated the progress of attempts to produce and distribute good quality seeds in her article "Seed Production-Decentralized System Essential." She has stressed that the primary agricultural cooperative societies can play an important role in achieving the objective. She has provided the institutional infrastructure that has emerged for the growth of seed industry in the country. The author has commended the "seed village approach" initiated in Andhra Pradesh. Padma Ramachandran

20 Padma Ramachandran: Seed Production Decentralized System Essential. The Hindu Survey of Indian Agriculture. 1991
has pleaded for the development of cluster of villages which could help solve
the seed needs of the entire country with concentrated development of areas
for the purpose. She feels that considering each cluster of three-four villages
under the jurisdiction of a society with an area of 500 hectares only 1232
clusters will be needed to produce the total seed required.

The authors' discussion of the new policy thrust of the union
Government towards the seed production processing and distribution has
been quite comprehensive. The views of the author have been quite useful for
the present study.

Dr. Mathura Rai and A.K. Pandey.21

The authors have made a comprehensive survey of growth of Hybrid
vegetables in India. In their paper "Hybrid Vegetables—Meeting Global Trade
Dr. Rai and Dr. Pandey have commended that tremendous progress has
been made in the development of hybrids in tomato, brinjals, chillies, bell
pepper, cabbage, cauliflower, cucumber, musk melon, watermelon, carrot
and onion. The authors maintain that till date 42 vegetables hybrid varieties
have been recommended for cultivation based on multi locational tracts
conducted under All India Co-ordinated Vegetable Improvement project. (AIC
VIP).

21 Dr. Mathura Rai and A. K. Pandey: Hybrid Vegetables—Meeting Global Trade—
The authors have focussed on the grafting technique in vegetable production which has received much attention owing to its importance in successful raising under a biotic and abiotic stresses and other horticultural attributes. They say that watermelon cv sugar baby grafted on hybrid RS 841 (a hybrid between C moschata and C Maxima) had positive effect on plant development and earliness. Grafting of Tomato on resistant root stocks provides an alternative to methyl bromide fumigation for the control of disease such as corky root. The authors have cautioned against the over use of fertilizers in vegetables. They opine that such practice would damage the quality of vegetables.

Export potentials of vegetables has been pointed out by the authors. They contend that the WTO and GATT has opened new opportunities for exporting fresh and processed vegetables. They have suggested that Agricultural and processed Food Products Export Development Authority (APEDA) has identified traditional vegetables including Okra, Bitter guard, Chilly, Onion, Potato, and nontraditional vegetables like Asparagus, Celery, Sweet pepper, Sweet corn, Baby corn, Green peas, French beans, Cucumber, Gherkins and Cherry Tomato having good export potential.

Dr. Rai and Dr. Pandey have maintained that the availability of quality seed is sineque non for enhancing the vegetable production in the country. Further the authors assert that the cost of seed is only a tiny fraction of total
cost of inputs involved in growing a vegetable crop providing good quality seeds is one of the most important and easiest means to accelerate the productivity of vegetables in the country.

The authors have stressed the need for developing efficient infrastructure for post harvest operation facilities on large scale and for processing technologies to meet growing requirements. The authors have suggested that there is need to develop pack houses cool chain facilities from place of production till the material reaches to port and exported. Many of the constraints relate to increasing production, improving quality, productivity and expanding state of art and modern infrastructure.

S. J. Patil²²

Dr. Patil in his paper "Improvement of use of Quality Seeds at Farmers Level" has observed that the use of good quality seeds, confined with complimentary inputs viz. fertilizers, irrigation and plant protection chemicals etc has the potential for rapidly and substantially increasing crop production. The use of quality seeds of improved verities has been mainly responsible for the success of green revolution in the developing countries. Dr. Patil however laments that the prices of certified quality seeds are high, the big shortfall in quality seeds and high prices are the factors forcing the poor farmers to use poor quality seeds or their own produce. He proposes

that the availability of quality seeds has to be increased Two to Three times more particularly in respect of self pollinated crops. He has further suggested that more efficient extension strategies for popularizing newly released high yielding varities specific to agroclimatic conditions should be worked out and the farmers should be made known about the production, procurement and storage of quality seeds.

**Mangala Rai**

In her lecture on "Seed and Seed Development for Agricultural Transformation in India", M. Rai has mentioned that inspite of best efforts of both public and private sectors, we only supply about 12 percent of the total seed for sowing each year. Hence large area is still sown with farmers saved seeds and therefore it is imperative to improve the availability of quality seeds to raise the seed replacement rate. The targeted SRR is also very low in case of hybrids, maximum being in pearl millet which is less than 40 percent though the seed replacement rate in case of hybrids should ideally be 100 percent to get maximum yield advantage.

Ms. Rai, says although India is first in the world to develop hybrids in a number of crops yet the area coverage under hybrids is quite low viz. cotton 3.45%, maize 7.90%, sunflower 8.54%, sorgham 17.81% and pearl millet 26.79%.

---

Ms. Rai maintained that majority of farmers are not inclined to purchase quality seeds, since they are not very much aware about its impacts and also because of their socio economic status. Hence the SRR is also very low. Ms. Rai has suggested for diversification of seed production areas in terms of seasons and regions.

Deepak Mullik and M.J. Vasudev Rao.

Mullik and Vasudevrao in their paper *Hybrid Development Present status, future perspectives National and International Scenario* have affirmed that the Indian seed industry has now reached a stage of maturity and competence and is in a position to shape itself to compete at national and international levels. The industry can develop and produce superior high quality seeds of international standards at cost advantages compared to Global competition. A progressive policy and an effective legislation will help the Indian seed industry play its rightful role to capture for the Indian farmer a piece of the emerging global seed trade of Rs. 1800 crore in the next decades. This will ensure that hybrid research and development will be explored to its full potential in future by our seed industry for the benefit of our farmers and our country's agriculture.

---

24 Deepak Mullik and M.J. Vasudevrao - Ibid pp 27 – 32
M. Rangswamy

In his paper "Role of Public and Private Sectors in Hybrid Seed Production" Mr Rangswamy has contended that a strong link should be established from the level of breeder to the ultimate user through a system of net work involving public and private sector seed growers. The public sector should entrust the work of seed multiplication to private sector in areas where it is having constraints. This will help the farmer to reap better yield.


The authors in their paper "Role of Seed certification in quality control" have asserted that seed certification is performing the vital role of regulating seed quality. They maintain that seed certification is a time tested and highly perfected system for accomplishing the task of making available good quality seeds to the farming community. They exhort the seed farmers not to consider seed certification as a hindrance but deem it as a way to ensure quality of seeds marketed by them and to seek the confidence of seed users.

The authors have referred to the practice of seed certification in most of the countries. They say that in India there is every possibility of exploiting the farmers community by supplying sub-standard seeds. Hence it is necessary to enforce a third party certification in quality seed production.

---

25 Mr. Rangswamy Ibid pp 44 – 49
26 A. Rajanna, B. R. Nagabhushana Reddy And S. N. Vasudevan. "Role of Seed Certification in Quality Control" Ibid pp 77 – 86
Vidychandra And Mahadevappa.  

The authors in their paper “Hybrid Rice: A Challenge for Seed Industry” have suggested the following steps for supporting the growth of seed production activities in India.

1. Regular Training programmes to industry and seed farmers.
2. Studies on quality and storage of seed to increase the viability.
3. A systematic maintenance of purity of parental lines.
4. A close contact and exchange of private and public seed agencies.
5. Government support to the seed industry.

S. P. Sharma And M. Dadlani.

Examining the “Present and Future Research Thrust on Hybrid Seed Technology,” the authors have made some significant observations. They content that in order to maintain genetic purity of parental lines and hybrids during production appropriate isolation distances have to be standardized. Since hybrid seed is expensive and the farmers need quality assurance precise methods for identification of parental lines and hybrids need to be developed for testing genetic purity of the seeds. The authors further states that equally important is the development of technology for maintaining seed quality through suitable packaging materials and storage condition.

28S. P. Sharma And M. Dadlani.; *Present Status and Future Research Thrust on Hybrid Seed Technology* *Ibid* pp 33 – 39.
V. Sankaran.29

The authors in his paper "Seed quality Control System in India options for change in post WTA ERA I" has suggested some changes relating to seed quality control systems.

1 Compulsory variety registration has to be introduced and so designed as to facilitate and ensure full disclosure of all the details are essential for seed certification and law enforcement.

2 Certification and law enforcement may be delinked from notification and instead linked to registration. This would make every registered variety eligible for certification and bring it under the ambit of law enforcement as against the present state of restricting these quality control measures only to notified varieties.

3 Creation of regular functional control Seed Certification Authority (CSCA) to oversee and verify the technical quality of certification job and the effectiveness of standards and procedures in vogue. This could help in developing scientifically sound certification arrangement throughout the country.

4 Seed crop inspection for certification is manpower intensive. It demands time and mobility. To be effective it has to be quite timely.

5 Norms/yardsticks have to be developed for internal in-house Quality Control standards, systematic and arrangements which any seed Organisation should possess and adopt. Those confirming to the norms could be authorized to use a "Seed Mark" symbol on the lines of Agmark.

6 Atleast four STLs in Four zones have to be geared up to secure membership with ISTA as authorized Labs for issue of ISTA Orange Certificate. This would help promote India's seed exports.

7 The scope of Indian Seed Quality standards and quality evaluation arrangements in STLs have to be enlarged to include seed vigour and expand seed health aspects and Laboratory level genetic purity. Genetic purity verification at Lab level through high tech methods is an important area. Attention to these would have value addition to Indian seed.

**Dr. Kumar Bhatia.**

In his paper on "Seeds Industry Achieving Variety Diversity" Dr. Bhatia has contended that while providing the appropriate climate for the seed industry to utilize avoidable and prospective opportunities, safeguarding the interests of India Farmers, protecting and conserving agro – biodiversity and traditional knowledge are also central concerns. The author says that the role of the seed industry is not only to produce adequate quality of quality seeds

---

but also to achieve varietal diversity to suit various agro climatic zones of the country.

Dr. Bhatia maintains that the scope of Indian seed quality standards on the one hand quality evaluation arrangement in seed Testing Laboratories on the other have to be enlarged to include seed vigour and to expand seed healthy aspects and lab level genetic purity. The author has opined that this would call for standard formulation prescription of procedures, creation of testing facilities and training. He has further mentioned that vigour and health have remained as the less verified quality components so far Genetic purity verification at lab level through high tech methods is also an important area attention to these would have value addition to Indian seed.
Organization of the Study

The present study has been designed to cover the following seven chapters.

Chapter I: The first chapter is devoted to present a brief introduction to the topic of research followed by an explanation of the need for the study, scope and objectives of the study, methodology of data collection and a review of the existing literature on the related aspects of the research topic.

Chapter II: The second chapter deals with the narration of the evaluation and growth of the seed industry in India, Karnataka and the Haveri district.

Chapter III: The third chapter provides production and marketing dimensions of seed companies in the Haveri district covered by the study.

Chapter IV: The main thrust of the fourth chapter relates to general profiles of the respondents seed producing farmers in the Haveri district covered by the study.

Chapter V: The fifth chapter of the research study covers various production dimensions of the production of seeds by the respondent farmers in the study area.

Chapter VI: The sixth chapter is devoted to the discussions and analysis of the marketing dimensions of seeds by the seed farmers and the seed companies operating in the study area.

Chapter VII: The seventh chapter contains a summary of findings, conclusions and suggestions.