STUDY REPORT

ON

PRODUCTION AND MARKETING OF VEGETABLE SEEDS IN N.W.F.P.

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PRODUCTION AND MARKETING OF VEGETABLE SEEDS IN N W F P (PAKISTAN)

I Introduction

N.W.F.P. has fortunately been bestowed with rich natural resources and well-suited agro-ecological zones, having wide range of diversity of climatic conditions. This situation is ideal for commercial production of almost all types of farm crops, fruits and vegetables. The soils and sub-soils are generally deep and rich, the irrigation system is vast and certainly the best in the World.

The farmers, by and large, are hard-working, toiling for long hours day and night and are devoted to their inherited farming work since generations. They have long experience, rich folk- knowledge and traditional expertise.

The greatest asset is that the farmers have developed progressive attitudes in their farm work during the past decade. They have become willing and keen to accept change, and change for better economic life. An average farmer, in general, is gaining awareness and interest in adoption of agricultural innovations and improved farm technology with the objectives of higher crop-yields, higher income and higher prosperity of the farm-family.

The N.W.F.P small farmers after achieving profitable yields from small farm-enterprises have led them towards diffusion of important inputs like fertilizers, efficient farm machinery & improved seeds of high yielding varieties. They are adopting high value crops-fruits and vegetables and especially off-season (early and late) vegetable cultivars at an accelerated rate.

It is well-stated that the average farmer has reached the stage of aspiration explosion. Undoubtedly this development attitudes of the farmer has great potentials for higher farm-productivity of high value vegetable varieties with high cropping intensity and by use of latest quality vegetable seeds.

II Scope and significance of Vegetable Growing In N.W.F.P

Production of vegetables in N.W.F.P as an economic enterprise has high significance, special attributes and great potentials in view of the following contributing factors :-

1) Vegetables have undoubtedly higher nutritional qualities in human diet. Most of the vegetables especially leafy type and carrots are rich source of vitamins, minerals and also specific vegetables supply good quality of protiens.

The daily per capita consumption of total vegetables (leafy, starchy, roots and others) decreased to 76 grams during the year 1976-77 as compared to 95 grams in 1965-66. However, green leafy vegetables alone provided 18.4 percent of the total iron intake in the average national diet and alongwith other vegetables have contributed 38.3 percent to Vitamin A consumption.

It is intersting to record that per capita consumption of total vegetables in Northern Areas of Pakistan (NWFP) (1980) has been reported as high as 214 grams per day.

2) Vegetable crops are ideally suitable for small farm holdings and offer better employment opportunities for the increasing population.

There is an increasing population pressure at annual growth rate of over 3.0 percent in Pakistan. The land holdings are decreasing in every generation causing sub-division of land to un-economic size of smaller farm-units.

In addition, three soil diseases of water logging, salinity and erosion are continuously threatening the production and yields of farm crops.
(see illustration 1).

In consequence, the choice and functional solution is following higher cropping intensity-practices of high-cost/ value especailly vegetables, which have greater production - potential on the annual basis per land unit (two season - vegetables).

3. There is higher level of nutrition and demand for variety of better quality of foods by use of vegetables with increasing educational level and exposure of the public to better sources of information on food and nutrituion through mass media.

4. It can be generalized that vegetables have higher yields and higher cash value especially on small farms as compared to other farm crops in a season or cropping year. Companion, relay cropping, inter-cropping in fruit gardens and mixed or multiple cropping are well-accepted improved practices which are followed by progressive farmers.

5. Vegetable production is both capital-and labour-intensive enterprise. Important factors of economics of vegetable growing involving high costs need to be recognised i.e. higher cost of labour, seeds, fertilizers, plant protection, harvesting, transportation and marketing.

6. Greater scope lies in securing higher yields by cultivation of choice quality off-season specialized vegetables. Selection and use of best quality seeds of suitable varieties in the specific tract or zone is the major contributing factor, **with particular reference to [illegible] situation.**

7. Higher vegetable yields of superior quality is feasible and determined by the principles of demand and supply with increased local consumption.

It is true especially in view of too high and unbearable increase in price and shortage of meat during the past few years.

8. Vegetable growing offers greater scope and feasibility for export of specific specialized varieties to the Middle East Countries. Pakistan Government has formulated a plan for development of specailized vegetable crops with export - oriented Policy in the 7th 5 Year Plan (1988-93). N.W.F.P can play vital role to achieve this high objective and target.

9. Successful cultivation of vegetables is directly related to ensured regular supply of irrigation water at short intervals of about one to two weeks depending upon the zone, climate, soil and irrigation requirements of different vegetables. Irrigation water can be supplemented by tube-wells, wells, or other suitable source like canal.

10. Vegetable enterprise requires specialized technical skills, practical experience and expertise in adoption of improved practices and supervized cultural operations. In addition, efficient, and adaptable farm machinery, implements and tools are essential pre--requisites.

The vegetable growers are advised to learn skills and practices from the Horticultural Stations as well as from other experienced progressive growers in the area. Well-organized vocational and technical training of the small educated progressive farmers need to be put into Action Plans.

11. Higher significant factor in successful and profitable vegetable production enterprise is the marketing aspect. .. This comprises of harvesting, handling, packing, type of farm-to-market roads, transportation system and cost, nearest viable market, price fluctuation and, above all, numerous marketing mal-practices and deterimental role of the middle men.

II. Estimate Area and Production of Vegetables in N.W.F.P.

Comparative data relating to Area and Production of all Vegetables excluding potato in N.W.F.P during the past 10 to 15 years - 1970-75 to 1984-85 are presented in Table 2. By review of the data, it is evident that the total area under vegetables in N.W.F.P has considerably increased from 15.3 thousand hectares in the years 70-75 to 21,4 thousand hectares in the year 84 - 85. However, the releative increase in area of vegetables in N.W.F.P as compared to Baluchistan province has been slo from only 6.4 thousand hectares to 20.9 thousand hectares respectively during the period of 70 - 75 and 84-85 in Baluchistan province.

Similarly, total production of vegetables in N.W.F.P. during the years 70 - 75 is reported as 225.2 thousand tonnes with minor increase to 334.7 thousand tonnes during the year 84-85. On the other hand, vegetable production in Baluchistan has increased by nearly 7 times from 42.. thousand tonnes to 306 thousand tonnes during the years 70-75 and 84-85 respectively.

The above data clearly prove two fundamental points of significance for potential increase in vegetable seed production in N.W.F.P and for taking dynamic policy-decision. It is evident that---

- agro-ecological situation alongwith irrigation resources are more favourable in N.W.F.P as compared to Baluchistan province conditions.
- as such, there are greater potentials for vegetable seed production in N.W.F.P not only to meet the increasing demands of N.W.F.P , but also will lead to added surplus vegetable seeds for supply to other provinces of Pakistan. Consequently, this will help in reduction of vegetable-seed imports with greater self-reliance on local vegetable seeds, and thus savings in hard-earned foreign exchange.

Further data and detailed information of area and production of vegetables during the years 83 -84, 86-87, and projections for the years 1999 - 2000 are presented in tables. 2-A, 3,4, and 4-A.

A summary of the relevant data is given as follows. This vividly explains high significance of vegetable production for domestic consumption and projections for export to the Middle East and Gul States.

Year	Area (Million ha)	Production (Million tons)
1983-84	0.2	3.1
1985-86-87	0.15 (excluding condiments)	3.65
1999-2000	4.5	8.0

It is evident that due emphasis needs to be placed on higher production of vegetables for increased local consumption in N.W.F.P. and meeting the export targets.

Present per capita vegetable consumption is only about 100 grams in the country while the minimum daily requirements of vegetables for a Pakistani nation needs to be increased to 300 to 350 grams per capita.

By a review of relevant data in the above tables it is evident that export stock of vegetables lagged behind by - 0.04 million tons during the Benchmark year (1987-88). However, the recommended projected productions indicate 8.00 million tons with special provision of 0.24 million tons as export stock

These are promising projections requiring dynamic Government Policy and implementation Action Plans by the provincial Agricultural Departments for achieving the targets.

At this point it is appropriate to give a brief review of vegetable production since last 30 years. Production of vegetables has remained almost static during the years 1960s for a number of reasons e.g. lack of quality seeds, lack of production technology, lack of specialized vegetable farms and narrow choice of improved cultivars. In additions, higher priority and emphasis were given on gaining self-sufficiency in wheat and other cereal production.

Estimated total area and production of vegetables in Pakistan (West Pakistan only) during the years 1957-58 were reported as .009 million hectares only (.222 million acres) and 1.965 million tons.*

However, since the year 1970, vegetable production has been growing at an average increased rate of 3.4 percent annually.

Estimated Area and Production of Vegetable - Comparative data of NWFP (inclusive of Northern Areas of high altitude like Gilgit, Kalam) and Pakistan.

Year	NWFP Pakistan	Area (Million ha)	Production (Million ha)
1983-84	NWFP	0.04	0.62
	Pakistan	0.20	3.10
1985-87	NWFP	0.03	0.73
	Pakistan	0.15@	3.65
1999-2000	NWFP	0.90	1.60
	Pakistan	4.50	8.00

Note :-Estimation of Area and Production of Vegetables in NWFP has been made on the basis of approximately 20 percent in comparison to estimated data of Pakistan.

@ exclusive of area under condiments.

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* Dr. Ali Asghar Khan and Mian Hidayat Ullah A Guide Book of Agronomy and Horticulture, Carvan Book House, Lahore. March 1962.

Summary

Comparative data for NWFP and Pakistan are indeed convincing for potential increase in the area and production of vegetables in the province from the present level of 20 to 24 percent to as high as 30 to 35 percent.

In view of the suitable agro-ecological conditions with cool dry weather desirable clear day-length, and potentials of development of irrigation resources, it is economically feasible for higher production of specialized higher cash - value and off-season vegetables in NWFP. The above ideal conditions are especially prevalent in the Northern Areas of Pakistan e.g. Gilgit, Skardu and Kalam etc.

IV Important Recommended Varieties

Comprehensive list of important recommended vegetable varieties with cultivar - characteristics and average yield potential (in tons per hectare) is presented. However, the economic feasibility and adaptation of a particular variety will have specific significance and economic success - potential in suitable agro-ecological conditions of N.W.F.P.

Special consideration needs to be given to each recommended variety for its economically successful performance in the high altitude tracts in NWFP and Northern Areas of Pakistan.

The source of these recommendations is the Horticultural Section, National Agricultural Research Centre, Islamabad.

V Essentials of Vegetable Seed Production

In addition to various agronomical and biological factors, there are two basic reasons of low average yield of vegetables per land-unit. These are :-

(i). Lack of high yielding varieties specially suited to different ecological zones and cropping seasons in the N.W.F.P

(ii). Non-existance of a scientific system for production of choice quality vegetable seeds of high value cultivars.

It is obvious that imported hybird vegetable seeds are too expensive being out of the purchasing power of the small farmers. Further, imported seeds deteriorate in hybird vigour yield as well as quality potentials in the successive years.

It is true that producing of quality seeds is one of the most difficult and complex task, which requires special skills, expertise and supervised professional experience. A viable vegetable seed production programme should aim at the following objectives.

(i). To maintain genetic purity and characteristics of the the specified registered vegetable variety.

(ii). To avoid mixture of foreign material at all stages.

(iii). To ensure keeping the seeds free from attack of serious pests and diseases.

(iv). To maintain and upkeep proper seed - vigour and viability.

Following essential points should be kept in view in the vegetable seed production programme :-

(i) Ensure the purity of the variety. Some local varieties like cabbage, couliflower, onion, tomato etc. need purification through successive selections. A variety will degenerate and lose its purity through mechanical admixture of off-types material, cross-pollination mutation or segregation of the parential material.

(ii) Systematic research work is essential to develop special varieties suited to various agro-climatic soil and irrigation conditions resistance to pests and diseases as well as the consumers demand and taste, in Horticultural Research Stations of N.W.F.P, with special mention of Tranab Farms.

(iii) Packages of improved seed production technology need to be developed for commercial production of selected varieties.

(iv) Provision for system of registration and release of the improved cultivars as the government policy is an essential pre-requisite.

(v) Maintenance of self-pollinated vegetable varieties like pea, bean, lettuce, tomato etc. is comparatively easier than the cross - pollinated cultivars.

Pedigrce and Mass selection are practised for monitoring genetic purity of a variety.

vi) It is essential to have through knowledge of the related crops in order to avoid corss-pollination.

Following crops are highly cross-pollinated.

Cabbage	Spinach
Cauliflower (some varieties)	Onion
Carrot	Cucurbits
Radish	Knolkohl
Turnip	Broccoli
Mustard	Brussel
Beet	sprouts

The crossability in case of some important vegetable crops is reported as under :-

- Turnip and Chinese cabbage freely cross.
- In cole crops all crops of oleacera group i.e. cabbage, cauliflower, kohlrabi, brussel sprouts, broccoli, freely cross with each other.
- In case of crops of mustard families crossing takes place.
- Muskmelon and longmelon crossing takes place freely.

Following methods are used by exercising full care for maintaining varietal purity of cross-pollinated crops.

- Mass selection method
- Mass pedigree method

(vii) It is essential to keep proper isolation distances between the cross-pollinated crops. Ensure to maintain a minimum distance of 1000 to 1600 meters in cross-pollinated varieties.

(viii) In self-pollinated vegetable varieties, the seed multiplication observed is 1:15. On the other hand in case of cross-pollinated cultivars seed-multiplication is 1:1000. One or maximum two stages of multiplication after basic seed is advisable. See table 9

(ix) Harvesting, drying, processing, storage and distribution of the vegetable seeds should be done with all possible care and skill at the appropriate stage and time.

(x) Vegetable seed processing plants should be established on moderate scale in the main seed production areas of the provinces, especially in the Northern Areas with cool dry climatic conditions.

(xi) Support price or subsidy for the quality vegetable seeds should be essentially provided by the Government as the built-in Policy to serve an incentive for the Seed Producers.

(xii) The field horticultural staff, technicians and progressive farmers should be provided with functional training programmes in the modern techniques of vegetable seed production, plant protection, harvesting, processing, storage and distribution.

xiii. All possible facilities, services, support and guidance in system and improved practices of marketing should be organised for the benefit of the vegetable seed producers of N.W.F.P.

VI. Study Methodology

The Study is mainly based on long professional experience and expertise of the Consultant in the field of Horticulture - Fruit and vegetable Culture at the national and international levels.

In addition, professional discussions have been held with the directly concerned national and provincial horticultural experts, scientists, subject specialists, and experienced Extension personnel in N.W.F.P. The list of the personnel is presented on pages 13 & 14.

Reference has been made to relevant literature, books, journals, documents, and publications in the subject of Horitucluture, with special mention of Vegetable Production, e.g. Report of the National Commission on Agriculture, 7th Five Year Plan, and Report of Agricultural Statistics of Pakistan, 85 . However, publications on the subject of Vegetable Seed Production and Marketing in N.W.F.P are lacking.

Sample list of Vegetable Seed Firms, Research Institutions and Fruit and Vegetable Development Board, N.W.F.P is given on page 15 . Further exploration of the Seed Merchants in N.W.F.P needs to be made not only in Peshawar, but also in the Northern Areas of the province, and Azad Tribal Areas.

PROFESSIONAL DISCUSSIONS

1. Dr. Daud Ahmed Khan,
   Consultant (Horticulture),
   Pakistan Agricultural Research Council,
   Islamabad.

2. Dr. Mohammad Ashraf,
   Coordinator (Vegetables),
   National Agricultural Research Centre,
   Islamabad.

3. Dr. Sardar Mohammad Moghul,
   Potato Coordinator,
   National Agricultural Research Centre,
   Islamabad.

4. Mr. Nur Mohammad Malkana,
   Senior Scientific Officer (Vegetables),
   National Agricultural Research Centre,
   Islamabad.

5. Dr. Altaf Hussain,
   Director, Vegetable Research Institute,
   Ayub Agricultural Research Institutue,
   Faisalabad.

6. Dr. Mohammad Hussain Ch.,
   Director, Horticultural Research Institute,
   Ayub Agricultural Research Institute,
   Faisalabad.

7. Malik Mohammad Afzal,
   Director General of Agricultural
   Extension, Punjab,
   Lahore.

8. Mr. Ghulam Abbas Jalvi,
   Director of Agricultural Extension
   Barani Project,
   Rawalpindi.

9. Sh. Abdul Latif,
   Assistant Professor (Plant Protection),
   Allama Iqbal Open University,
   Islamabad.

10. Dr. Abdul Hafeez,
    Director (Retd.) FAO,
    Near East Regional Project on
    Field Food Crops,
    Islamabad.

11. Dr. A. Rahim Ch.,
    Chairman,
    Farm Guide Council of Pakistan,
    Lahore.

12. Mr. Ghulam Abbas Jalvi,
Director of Agricultural Extension
Barani Project,
Rawalpindi.

13. Sh. Abdul Latif,
Assistant Professor (Plant Protection),
Allama Iqbal Open University,
Islamabad.

14. Dr. Abdul Hafeez,
Director (Retd.) FAO,
Near East Regional Project on
Field Food Crops,
Islamabad.

15. Dr. A. Rahim Ch.,
Chairman,
Farm Guide Council of Pakistam,
Lahore.

Vegetable Seed Firms, Merchants, Horticultural Research Institutes, and Farms.

1. Haji Mian Nazu & Mohammad Yousaf Khan, Vegetable Market.

2. Some Firms and Private Parties - Vegetable Seed Importers, Distributors and Suppliers in Azad Tribal Areas of NWFP

3. Fruit and Vegetable Development Board. Government Agency having Planned Programme of Vegetable Production as one of its activities.

4. **Horticulture Research Station, Tarnab, Peshawar.**

VII. PROBLEMS OF VEGETABLE SEED PRODUCTION IN N.W.F.P

Important aspects of potentials and some salient problems of vegetable seed production have been described in Chapters II and V respectively.

It is relevant to further explain the major seed production problems supported by data at this point of discussion.

High quality seed is well-recognised as the most vital factor for improvement of quality and increase in yield of vegetable crops. Unfortunately, this essential and more significant aspect of vegetable production has been either ignored or did not received due attention in the Policy of horticultural development in Pakistan.

A summary of the serious problems of vegetable seed production is presented as under:-

1. Lack of Commercial Organization

It is of high concern that presently there are no significant commercial organisations, Institutes or Divisions both in the public and private sectors, which are responsible for producing good quality seed of at least some vegetable varieties., in N.W.F.P

However, Vegetable Research Institute in Punjab, Fruit and Vegetable Development Board in NWFP are also multiplying or have formulated development programmes for vegetable seed production on a limited scale.

It is encouraging that Vegetable Research Institute, Ayub Agricultural Research Institute, Faisalabad has done good service by producing and annual sale of improved quality seeds valued at Rs.02 to 0.25 million rupees, which can serve as a model for N.W.F.P

This is a remarkable progress and achievement with increased quantity of seed multiplication and sale of vegetable seeds amounting to Rs.0.4 million during the year 1987. The improved vegetable seed kits enough for sowing of small home gardens are sold to the public, especially uder the Green Belt Project [illegible].

Maximum quality of vegetable seeds have been produced under the public sector in Baluchistan province in view of departmental activities and suitable climatic conditions.

2. Dependence on Imported Vegetable Seeds

It is alarming to note with grave concern that only approximately 4 to 5 percent of the vegetable seeds have been produced locally, while 95 to 96 percent of the total quantity of vegetable seeds are annually imported. This is, indeed, heavy loss and unbearable burden on the foreign currency needs of the country.

3. Vegetable Seeds Produced V/s Required

Data of annual demand and supply of presumably improved quality vegetable seeds are presented in table. 5,6,7, & 8.

A summary of the seeds produced and imported indicating the annual supply and demand of vegetable seeds is presented as follows:-

Item	Quantity tons Annaul Basis	Percent
Total demand (requirement as at present)	2220	100
Locally produced	83.8	3.8
Improted	2,136	96.2
Total projected Demand(requirement)	2,312	100
Locally produced/Imported	2,220	96.02

By review of the above data, it is clearly indicated that N.M.R.P/ Paki has been totally dependent upon the import of nearly all of its vegetable seeds - demand while the local vegetable seed multiplication has remained at minimum negligible level.

This evaluation of the situation poses a great challenge of highest economic national importance to the Agri. Policy makers, Horticultural Specialists, Vegetable Experts and progressive famers. The interested educated and experienced vegetable growers need to be motivated and properly trained in the skill and technology of vegetable seed multiplication under both crash and phased programmes.

4. Lack of Progressive Farmers Adopting Vegetable Seed Multiplication

It is rather discouraging that niether progressive farmers nor vegetable growers have adopted vegetable seed multiplication as an economic enterprise on commercial scale. On the other hand good number of Indian educated, intelligent and trained have taken-up production of selected vegetable seeds on large scale; e.g. lady finger, bitted gourd and onion. They have been successful in this specialised system of farming, with higher economic benefits In fact, these Indian farmers have produced good quality vegetable seeds not only for home supply but also for export to other countries like Pakistan.

5. Lack of Professional Training, Skills and Technical know-how

It is well-accepted that vegetable seed multiplication is difficult complex and tecnical work. This especially true in the case of cross-pollinated vegetable crops. Present situation in N.W.F.P. in this regard is discouraging. Most of the vegetable growers taking-up seed-multiplication lack professional training skills and technology. In fact, they are practising the activity on a limited scale as secondary or subsidiary function by their traditional methods by using in-efficient technology and often performing defective and unskilled operations. The result is obviously un-economic returns for the participating farmers. This problem is more serious in the distant underdeveloped rural areas. The problem becomes worse in Northern Areas and N.W.F.P where literacy level is lowest at only 13 percent as against low national literacy percent of over 26. For reference see Illustration 2 and Table 1 .

6. Mal-Practices of Collection and Extraction of Inferior Quality Seeds

It is reported that in some cases vegetable seed producers and suppliers follow mal-practices of collection of seeds usually from the last picking or end of crop harvest left over inferior quality seeds. In some instances an illiterate labourer will collect rotten or thrown-away vegetable-seed-bearing part/fruit

from the vegetable markets or very frequently from city streets. They roughly extract and sell this type of product which by no standard cannot be classified as good vegetable seeds. It is obviously clear that the question of specified variety characteristi germination-potential, growth-vigour, yield and quality and above all, reasonable income can never be imagined or assured by following this type of mal-practice.

7. Lack of Economic Incentives to Vegetable Seed Growers of N.W.F.P

As discussed before, there are a number of sound reasons for non-adoption of vegetable seed multiplication as an economic farming enterprise, in N.W.F.P

One significant variable is lack of any good economic incentive to the vegetable growers and seed producers. It is agreed that most of these growers are at the mercy of the Seed Merchants. Since, the farmers are finally offered uneconomic and low prices by the vegetable seed shop keepers, therefore, the growers are obliged to undergo financial losses and distress.

There are many cases, in which a Seed Merchant or Seed Shop keeper would in the first instance give an un-written and informal contract to small seed producers to grow good quality seeds under the agreement to purchase the seed produce at fixed reasonable price. But, once the farmers produced vegetable seeds, and brought their hard- grown seeds, they were offered lower price. This clearly resulted in breach of mutual agreement and trust and total loss to the seed- growers. This mal-practice has caused many related problems, for example, seed shortage, high retail sale price, and at the cost of the vegetable growers. This leads to setting in of vicious circle of loss to the producers, who stop producing of seeds, short supply of reasonably good quality, high sale price of vegetable seeds charged by the seed merchants and shop keepers, and this also at the cost of the growers in turn in the end.

VIII. Seed Marketing Problems and Mal- Practices

Obviously, problems of Seed Marketing and Mal-Practices and Seed - production are inter-linked, inter-dependent, and mutually integrated. Important marketing problems have been duly incorporate and included with discussion of Seed-production problems in the previous Chapter. VII, of the Report. However, a summary of other outstanding related Marketing problems and Mal-practices is presented with added emphasis as follows.-

1. Liberal Government Policy of Seed Imports.

The Government after having noted the grave situation arising due to short supply of good-quality vegetable seeds has enforced Liberal Import Policy since last decade or so. Under this Policy any Importer or Investor has been allowed to import vegetable seeds from foreign countries with no checks on such essential criteria as quality, quantity, origin and source of supply, reputation and credibility of the exporting companies, or the country.

This Liberal Import Policy further does not place any restrictions nor conditions on the pre-qualifications, related buisness- and professional experience or the motives of the Pakistani Seed Importers.

Main bojective of this Liberal Import Policy was obviously to safeguard genuine interests and overall welfare of the vegetable growers in the country.

But it is rather disappointing to report that a number of Importers and Investors mainly from Karachi area have been grossly mis-using this Policy. The motives of these undesirable Importers are to secure maximum profits by employing unlawful methods and unfair means, being totally against the national interests in general, and genuine Seed Importers in particular.

2. Greed Motive of some Importers

As explained above, such Importers and Investors with greed motive have been heavily investing capital in vegetable seed import buisness. They, by and large, lack professional knowledge and also ignore or violate the essential criteria

e.g. quality, demand and supply factor of vegetable seeds and above all, the reputation of the Seed Exporting Companies.

3. Over-Imports of Cheap Inferior-quality Seeds

In some instances, such Investors have over--imported larger quantities of inferior vegetable seeds of unsuitable varieties regardless of their appropriate sowing and maturity periods under specific agro-ecological conditions prevelant in N.W.F.P..

Some Importers have been importing vegetable seeds at cheaper rates from defaulting Comapnies, which do not have good reputation nor proper credibility in the Export markets..

We can well-imagine and objectively assess vast damaging and ill effects on the genuine Seed Importerss on one hand, and the yields and quality of the vegetable produce on the other hand. This has been naturally determimental to the genuine interest, optimum income and welfare of the Vegetable Growers as well as the consumers, alike.

Some Examples of Mal-practice are relevant at this point of discussion.-

i. Best quality Royal Sluis variety of Holland is often not supplied by the Exporting comapnies, since it costs upto Rs. 100 for packets of 400 grams of original variety seed.

ii. Mino early long white Japanese variety of Radish will cost Rs. 55 to 60. But, by using mal-practice of imitation-packing, resembling the genuine packing) of inferior- quality seed-packet of almost the same design and same weight will cost half the price at Rs. 30 to 40 per packet.

4. Mal- Pratice of Imitation-packing

The mal-practice of imitation -packing by import of comparatively inferior -quality vegetable seeds at cheaper rates is better explained by the following examples ans statements of Price Analysis of genuine seeds v/s imitation-packed inferior- quality seeds as follows.-

Vegetable seed - variety	Price of genuine-seed packing-400 grams	Price of imitation packing-400 grams
Sugar baby- Niagra - USA	Rs. 5	Rs. 25-30 - Nice Grow- Thialnad

Vegetable seed - Variety	Price of genuine seed -packing-400 gms.		Price of imitation-packing - 400 gms.
Radish	Rs. 50	---- -	Rs. 15
Tomato	Rs. 100	----	Rs. 30 to 40
Turnips	Rs. 45 to 50	----	Rs. 17 to 18

5. Other Problems of Lack of Professional Knowledge and Skills

It has been observed that non-professional and non-technical importers and Traders have imported vegetable seeds by following some glaring ommissions and lack of technical know-how, and above-all marketing intelligence as well as expertise in this buisness. A number of relevant supporting statements in this respect are presented.--

i. vegetable seeds are imported with no care nor any consideration of specific suitable cultivar in specialised zones.

ii. due consideration of the authenticity and economic adaptability of imported seeds under local agro-ecological conditions in the specific situation in N.W.F.P is usually ignored.

iii. decrease in profit percentage in vegetable seed buisness from about 100 % to un-economic level of only 5 to 10 percent.

It is held that the problem of decreased and un-economic percent of profit has been recently created by over-imports of seeds, and use of many mal-practices by non-professional Investors and Importers, especially in Karachi area.

6. Defective Packing and Poor Storage of Vegetable Seeds

It is seen that no consideration of the optimum period of storage of imported vegetable seeds nor proper sowing time, maturity and harvesting seasons of the specific varieties , and neither sequential order of maturity is given by the Importers. Further, in N.W.F.P like other areas of Pakistan are packed, handled and stored by old, traditional and non-scientific methods. Vegetable seeds are, by and large, carelessly handled, and are either packed in old gunny bags, or loose-packed in open baskets. The seeds are usually stored in hot, dark, non-ventilated, and somewhat moist rooms and stores. It is rather discouraging that the care, and consideration of proper cool, dry and hygeinic well-ventilated stores are neglected. The seed-stores are open to infestation of improperly stored seeds and attack of rodents and birds. Defective methods of packing, handling, and storage of vegetable seeds cause decrease in seed-life, lower germination - potential, and high rate of seed-damage.

7. Non- Uniformity of Income-tax Assessment. Brief description of non-uniform Income tax assessment is relevant at this point .

Item	City/ Province	Income tax and other charges
Income tax	Lahore, Punjab	30 to 40 percent
	Karachi, Sindh	5 to 7 percent only
	Quetta, Baluchistan	10 percent
	NWFP, especially Azad Tribal Areas	Income tax free zone
Igra tax	Uniform for all cities/ provinces	3 to 5 percent
Surcharge	Uniform for all cities/ provinces	5 percent

It is evidently clear from the above comparative statement that high and wide range of Income tax assessment upto 30 to 40 percent in Lahore has been reported at the discretion and sweet will of the individual Income Tax Officers, against the nominal, low, or no tax in Karachi and Azad Tribal Areas of N.W.F respectively

This non-uniformity in Income tax assessment has led to disappointment, deparate decrease in Import buisness of genuine most experienced Vegetable Seed Importers . In few cases, this policy has resulted in failure of the Importing firms

This single factor of non-uniform Income tax assessment has in many instances resulted in mal- practices of mixing of inferior- quality seeds with choice- quality seeds as well as imitation-packing of inferior-quality imported seeds.

It is estimated that due to this disparity in tax assessment alone, seed- imports in Lahore have drastically decreased from 80 to 85 percent to lowest level of 5 to 10 percent only.

IX. RECOMMENDATIONS

In the previous discussions, with special reference to the pralems of vegetable seed production and marketing, following Recommendations are made for Policy-decisions and developing Action- Plans. The main objectives are to enhance commercial vegetable production- yields on scientific lines both for home consumtion and for export markets; to maintain and further improve the purity of vegetable seeds, ensuring quality of the produce of the desired standard; and toimprove the marketing system aiming at solving major marketing problems.

1. Policy-decisions

The Government should fomulate and enforce policy of maximum quantity of vegetable seeds of all such vegetable varieties, which are possible withim N.W.F.P.

2. Enforcement of Seed Laws

Federal and Provincial Seed Certification and Registeration Agencies should be established and be assigned the important responsibility to inspect vegetable seed crops at regular intervals, and be authorizedto certify health status, seed purity and viability according to prescribed standards. The technical horticultural staff should first draw representative seed-samples for further evaluation for strict enforcement of the Laws. The seed-quality standards can also be set-up through Conventions and by achieving good credibility among the farmers.

3. Implementation of Action-Plans

Policy-decisions and Action-Plans need tobe formulated and implemented with clearly specified objectives of phased local seed-multiplication of at least some suitable vegetable crops in maximum possible quantity. The objectives and targets should be set for enhancing local seed production from present low level of only 4 percent to 25 to 50 percent under immediate short-term Action-Plan. Further increase of local seed

multiplication upto 30 to 35 perc ible to achieve under the long-term Plan of Action under suitable local agro-ecological zones of N.W.F.P . It seems feasible to set and achieve the above optimum seed-multiplication targets within the 7th Five Year Plan period - 1988 to 93 by following-up dynamic policy and great challenge.

The related Agencies are to coordinate under built-in and continuing Policy-formulation and Decisions for meeting the above-stated objectives; the examples of the Cooperating Agencies are; Pakistan Agricultural Research Council, Agricultural Price Commission, and National Commission on Agriculture, Government of Pakistan.

4. Seed Processing Plants

Seed Processing Plants should be set-up in the main Seed Multiplication Areas and Zones, with regard to variety- and Ecological-specific requirements and potentials of seed- production in N.W.F.P.

5. Seed-Multiplication Farms

i. Semi-commercial Vegetable Seed Demonstration Farms should be established at the provincial, regional, and zonal levels. These Pilot Demonstration Seed Multiplication Farms may extend over an area of 25 to 100 acres, depending upon the specific local situatio These proposed vegetable seed multiplication Units should be managed by the Horticultural Departments and Sections or Sub-Stations either alone or in collaboration with Public Seed Corporations at the provincial, divisional, district or some other suitable levels. It is suggested that these Farms should also serve as Training/ Demonstration Centers, which are to be well-equipped with upto date technology, technical staff, and efficient farm machinery on-site.

ii. In addition, Private Seed multiplication Farms should be encouraged at areas of 25 to 50 acres. Selected interested, progressive, educated farmers and vegetable growers should be supported and guided to produce seeds of high quality on commecrial scale by utilizing latest technology and improved skills.

6. Price-Support and Subsidy

As discussed before, vegetable seed- production is a technical difficult, and complex agricultural enterprise. This profession involves high risks of seed-crop-failure, imbalance in supply and demand, fluctuations of seed-prices in the wholesale and retail markets, especially due to unhealthy competition with the imported seeds.

These factors have been adversely affecting the economic condition of the seed producers leading to their discouragement or adondoning this specialised farming profession. The obvious result is further shortage of locally produced vegetable seeds within N.W.F.P. . In summary, the national economic importance and dire necessity of local vegetable seed production need to be well-recognised by the Government of N.W.F.P.

It is recommended that farmers taking up this specialised farming should be given due encouragment, by ensuring support-price and subsidy for the quality seeds. This built-in government policy will help in economic returns and guarantee of reasonable level of success in this complex and technical business.

7. Off-season - Early and Late season -varieties choice-quality

Systematic Action-programmes need to be planned and implemented for local production of off-season - early and late choice variety specific to specialised Zones. Simultaneously, this objective can only be achieved by local seed multiplication of approved off-season cultivars and to reduce import of vegetable seeds, as well as to ensure the import of off-season varieties by meeting the criterion of off-season vegetables.

8. Regulation of Seed- Import of Superior- quality

There are numerous serious problems concerning import of inferior-quality seeds from companies and countries having doubtful credibility at cheaper rate. Above all, criminal mal- practice of vegetable seed mixing and imitation- packing by some firms with sole aim of earning undue profits under greed by using unfair means.

In order to find functional solution of this most serious mal-practice, it has been strongly held by the Consultant and related Experts that bulk Import of vegetable seeds should be ensured. Packing of the imported seeds should be packed in locally-made containers and packs. It needs to ensured that imports are contracted with only genuine, reliable and honest firms enjoining good standing and reputation in buisness. The above proposed procedure should essentially be chacked and monitored by technical staff of local Agricultural Marketing Departments. The provincial Agricultural Marketing Departments need to be strengthened and reorganised. The Marketing staff should be assinged such essential functions as regulation, handling, distribution and sale of imported as well as locally produced and properly packed under genuine labels.

9. Rate of Profit

As stated earlier, systematic Action-programmes need to be implemented in order to regulate the import, supply, and distribution of vegetable seeds in line with the principle of supply and demand in the local markets at reasonable price. This will have multi-dimensional healthy effects on vegetable crops production, supply, consumption, and vegetable seed-marketing. Due safeguards are to be provided to the genuine Seed Importers, Seed Merchants, Traders, and Dealers by ensuring optimum sale rates for the good quality local and imported seeds

This will help to regulate optimum enhanced rate of profit at 20 to 25 percent from the present low level of 2 to 10 percent only. During the past 15 years the profit charged by the Importer and Dealers used to be maximum of 100 percent, especially of the imported seeds. which also amounts to mal-practice of serious nature.

10. Uniform Policy of Income-tax Assessment

As explained before, the genuine Importers, Traders and Dealers are facing serious problem of diversified and varied rates of Income tax, being assessed by different Income Tax Officers in different cities, and province , at their individual discretion.

For solving this acute problem, firm policy-decision of uniform income-tax assessment on the imports, and sale of vegetable seeds in all the provinces, and all cities should be enforced. This basic decision will help in removing disparity, and discretionary powers of the individual Income Tax Officers. This action will surely provide due protection and safeguard to manage their seed buisness with confidence.

11. Motivating Educated Rural Youth in Seed Buisness

Selected, interested and educated Rural Youth need to be encouraged, and motivated to adopt production and possibly import of high quality vegetable seeds as a buisness. These selected educated Rural youth should be provided with facilities and servic comprising of well-organised training, technical guidance, latest extension and improved technology, and most important of all, financial support at rupees 50,000 each according the policy of Federal Government Agency of Youth Investment Promotion Society. This Society has a number of Regional Offices in Peshawar. The financial assistance as easy-term loans are advanced to unemployed educated upto Matriculation standard, to nearly 65 to 70 rural youth belonging to the rural areas, and doing farming work on small farms, aiming at self-employment and checking their migration to the cities.

12. Research and Surveys on Marketing Problems and Issues of Vegetable Seeds

As explained before in detail, commercial vegetable farming in N.W.F.P has since been facing most serious and cahllenging problems and issues, especially in the seed marketing domains. These include both home and foreign seed markets. The problems involve great challenges, high level of intelligence, skills, professional experience, indepth foresight, and capital investment In fact, the success of commercial vegetable production for home requirements and for export to foreign markets is largely dependen upon and determined by finding out functional solutions of these choric problems and issues.

Systematic research studies and surveys of the local seed-market- problems should be immediately initiated and planned.

It is further proposed to take up surveys of potential foreign markets for export of fresh vegetables and vegetable Seed Export Companies by qualified and experienced personnel. FAO and UNDP - United Nations Development Programmes should cooperate and sponsor such Research and Survey Studies both on financial and technical aspects on priority basis.

13. Training Programmes

In view of immense significance of vegetable seed multiplication, import, marketing, and supply it is suggested to take a Policy-decision on Organisation of Educational and Training programmes with summary as follows.-

1. Short-duration functional training courses on vegetable seed multiplication as well as on marketing should be organised under sponsorship programmes with proper incentives. Since this is new but highly important extension training activity, therefore, initial sponsorship is essential to attact genuine and interested farmers and rural youth to participate in the courses. An example of similar new subject of floriculture is evident from recent press notice and advertisement.

2. Education and Training Courses by Agricultural University, Peshawar and Training Institutes, and Agricultural Farms

The above Institutions should place first priority and due emphasis for incorporation in teaching courses on the subjects of Vegetable Production and Seed Marketing and Export of fresh vegetables to foreign Markets at competetive quality and rates.

3. Training Courses at Horticultural Research Institutes, and Agricultural Research Extension Demonstration Stations

The above training courses should also be organised by the Fruit and Vegetable Development Board of NWFP and Tarnab as one important function on regular, built-in and priority basis.

4. Mass Media Electronics - Radio and Television, Newspapers, and Allama Iqbal Open University

The training courses and educational functions need to supplemented by the above-named Institutions. These functions should incorporate bringing out popular leaflets, pamphlets, illustrated published materials and practical guidelines in simple language for distribution and supervised use by the

field extension staff at the village level. Agricultural Information Wing o of Agricultural Extension Department is well- equipped in man-power/ techno

14. Seminar and Workshop on Vegetable Seed Multiplication and Marketing.

National Seminar/ Workshop. It is suggested to organise a National Seminar / Workshop on important aspects of vegetable seed production and marketing, with special emphasis on determining functional Recommendations.

The National Seminar / Workshop should be followed-up by organising similar activity and professional discussions at the N.W.F.P-provincial, and possibly at the Regional, or Zonal levels in specialised areas having potentials for commercial production of specific vegetable crops and commercial multiplication of seeds in line with specific agro-ecological conditions, of N.W.F.P

Special consideration should be given to such suitable areas and tracts, like Northern Areas of N.W.F.P e.g. Gilgit, Skardu, Hunza, Swat, and Kalam valleys. These areas and Quetta valley in Baluchistan are ideally well-adapted for commercial growing of cool season vegetables and their seeds.

Participants in the above Seminars and Training Workshops should be invited representing such directly concerned Organisations and Agencies, with listing of proposed personnel as follows.-

1. Horticultural scientists, vegetable experts, and crop breeders from the Province , National Agricultural Research Centre, and International Agencies like FAO, and Pak-Swiss Potato Development Project.
2. Vegetable Seed Merchants, Importers, and Distributors, Suppliers and Shop--keepres. A list of some important representative Firms and Companies can be seen for selection. Examples of well-reputed firms are; Haji Natha and Mohammad Yousaf Khan, Peshawar, and Horticultural Research Station, Tarnab, Peshawar.

It is suggested to identify well-reputed and experienced Vegetable Seed Firms, merchants, and Importers in N.W.F.P.

3. Provincial Vegetable Research Institutes e.g. Tarnab, Peshawar. N.W.F.P Fruit and Vegetable Development Board, Peshawar, and

Experienced and Expert research staff from these Institutions should join in and actively participate in the Seminars and Workshops.

4. Horticultural extension staff and espcially Vegetable Technical workers at the field levels.

5. Progressive farmers; fruit and vegetable growers, with particular reference to specialised small farmers in specific agro-ecological areas and zones.

5. Vegetable Seed Producers, specialised in commercial vegetable seed multiplication work and also Contracting farmers for commercial production of vegetable seeds on behalf of the firms and shop-keepers at mutually agreed rates.

15. Collaboration of FAO with Other Agencies for Production and Marketing of Vegetable Seed Projects.

It is suggested that FAO should actively contribute in activities of Vegetable Seed Production and Marketing by participating and collaborating with directing concerned Agencies and Organisations in their on-going and planned programmes.

Some examples in this regard are presented as under.--

1. Cooperative Programme for Research Productivity Improvement and Marketing of Potato in Pakistan - April, 1987. This Project is jointly sponsored with Pakistan Government contribution of Rs. 8.25 million rupees, and Swiss Government making contribution of Rs. 20.75 million. The Project is progressing successfully under the technical supervision and management of Pakistan Agricultural Research Council, Islamabad. Its major objectives include development of coordinated national system of need of production and supply, and to study for improving system of marketing seed potatoes, marketing and utilization of table potatoes and potato export./ N.W.F.P Agriculture Department should collaborate with the Pak - Swiss Potato Development Project especially with regard to production and marketing aspects.

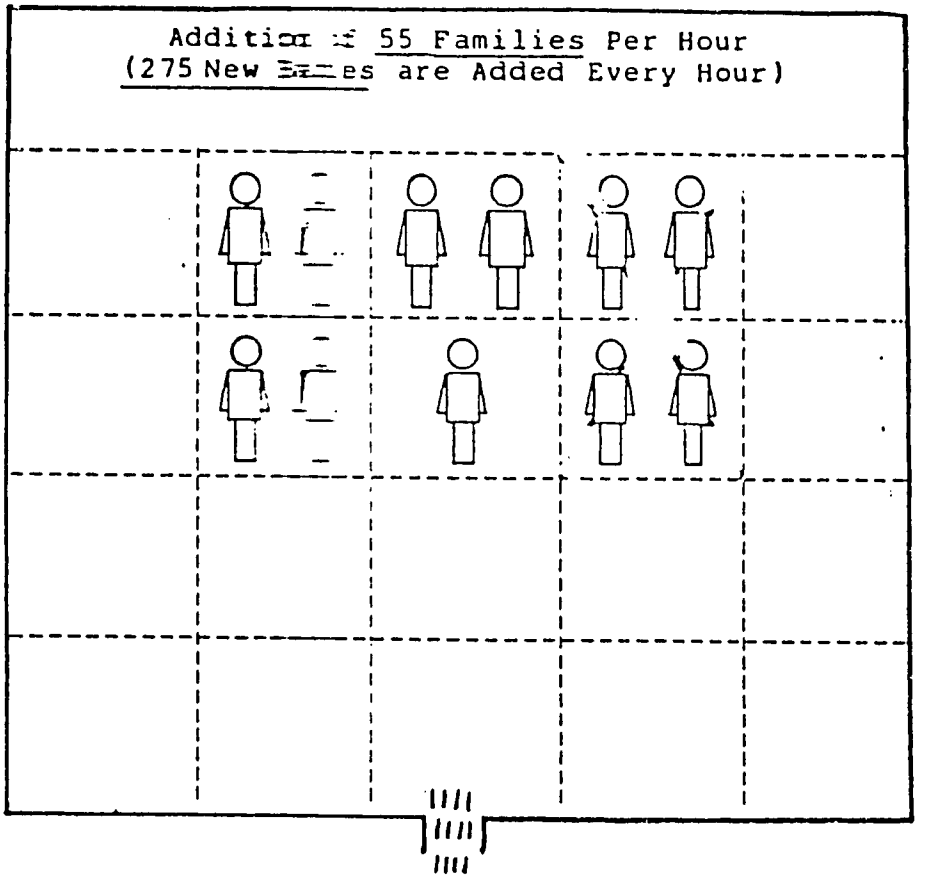
2. Collaboration of FAO with Private Agencies responsible for Seed Production and Marketing Functions

National Farm Guide Council of Pakistan, Lahore is the only private agency dealing in vegetable seed multiplication and distribution, which is headed by highly qualified and experienced Chairman. FAO needs to collaborate with this private organisation especially in production and marketing of vegetable seeds of high quality at the village and individual farmers' levels.

Illustration-I.

AN ANALYSIS OF DIRECT LINK BETWEEN POPULATION PRESSURE ON ARABLE LAND RESOURCES OF PAKISTAN

POPULATION PRESSURE -
(ANNUAL INCREASE @ 3.00%)

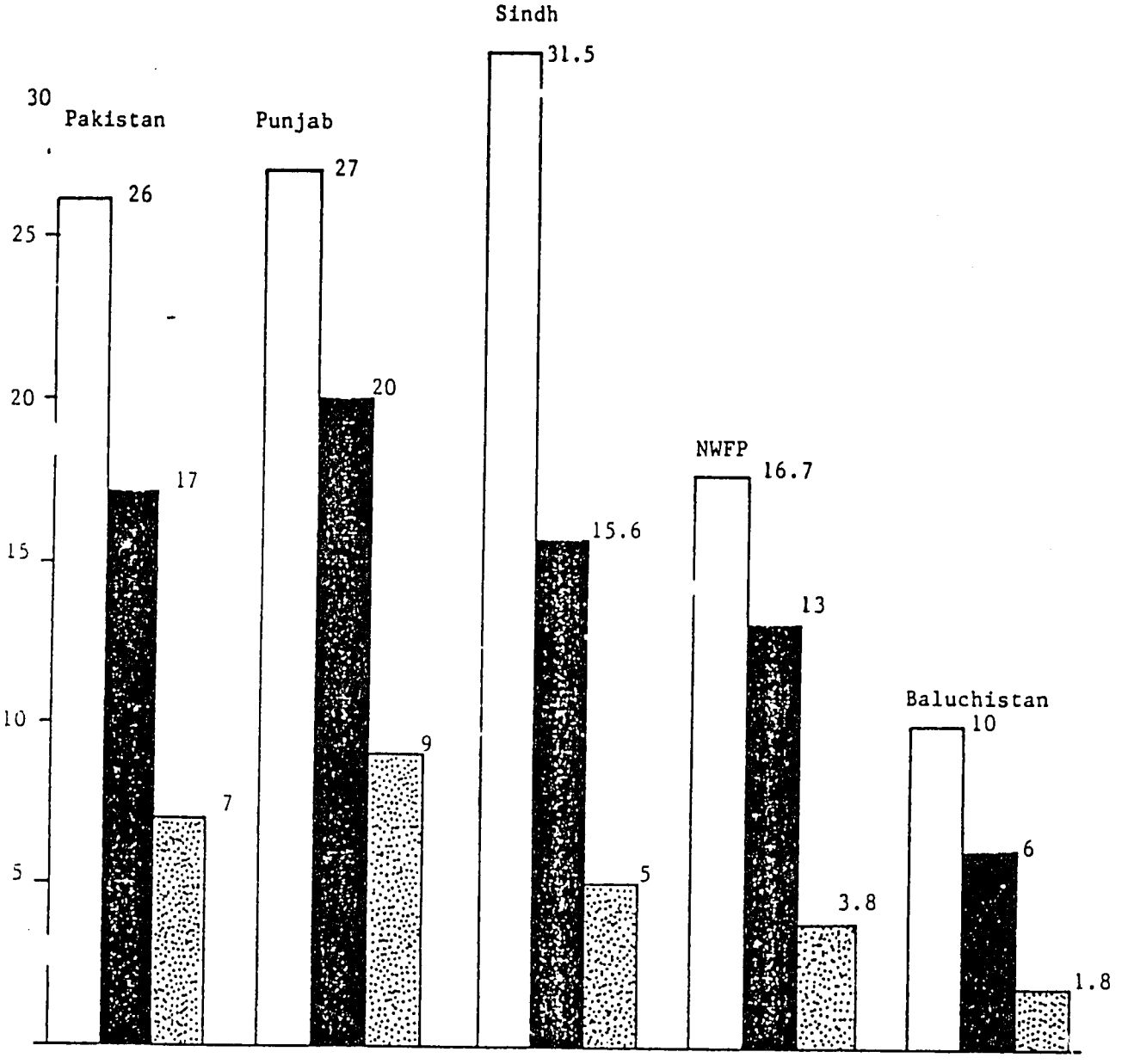


11.5 Acres of Fertile Irrigated Land Per Hour are adversely affected (due to three soil diseases i.e. Water Logging Salinity and Erosion).

This results in decrease of Productivity Potential of Soils.

Note: (11.5 acres are adequate resource for subsistance of an Average family of 6 to 7 members).

Graph- 2



Comparative Literacy level - Pakistan and Provinces

- National and Provincial over-all Literacy rate

- Literacy level in Rural Population (Both Male and Female).

- Literacy level in Rural Women

Table. 1. – GROWTH, DENSITY AND DISTRIBUTION OF POPULATION

Province	Area (Sq.K.ms)	Population (In Thousand)		Population Density		Urban Population (Percentage)		Annual Growth Rate (Percentage)	Household Size	
		1972	1981	1972	1981	1972	1981	1972–81	1972	1981
PAKISTAN	796,095 (100)	65,309 (100)	84,253 (100)	82	106	25.4	28.3	3.1	6.4	6.7
N.W.F.P.	74,521 (9.4)	8,388 (12.8)	11,061 (13.1)	113	148	14.3	15.0	3.3	6.1	6.8
FATA	27,220 (3.4)	2,491 (3.8)	2,199 (2.6)	92	81	0.5	–	(–) 1.5	–	8.3
PUNJAB	205,344 (25.8)	37,610 (57.6)	47,292 (56.1)	183	230	24.4	27.5	2.7	6.4	6.4
SIND	140,914 (17.7)	14,156 (21.7)	19,029 (22.6)	100	135	40.4	43.3	3.6	6.2	7.0
BALUCHISTAN	347,190 (43.6)	2,429 (3.7)	4,332 (5.1)	7	12	16.5	15.6	7.1	6.3	7.3
ISLAMABAD	906 (0.1)	225 (0.4)	340 (0.4)	259	376	32.6	60.0	4.5	5.5	5.7

IMPORTANT RECOMMENDED VEGETABLES VARIETIES
AND THEIR CHARACTERISTICS

S.No	Name of Crop	Cultivar	Plant/Fruit character	Average Yield Potential(Tons per hecta
(1)	(2)	(3)	(4)	(5)
1.	Watermelon	Sugar Baby	Early, matures fruit in 90 to 100 days in spring crop and 65 to 70 days in fall crop. Fruit is round(4.5 Kgs), dark green in colour, pulp red, T.S.S. is nearly 10 %, can withstand transportation and storage.	17.00-20.00
2.	Muskmelon.	Honey Dew.	It is a popular American Cultivar, as to my knowledge, it needs mild climate. Does not respond well to extreme heat and drought. Fruit colour light green to pale, flesh light green and slightly harder than our cultivars, better shelf life, T.S.S.-12 to 15 %. If it acclamatizes in Pakistan, it can eliminate our local cultivars. Average fruit weight is 1½ to 2 Kgs.	
		T-96	It is an early maturing variety with yellowish skin of the fruit having green stripes on it. Its fruit is of medium size, orange flesh, T.S.S. is 11-12 % and yields lower than Chichawatni but is better for transportation.	13.00
		Chichawatni	Late variety with green and light yellow mottles. Flesh is white & soft with a T.S.S. of 10-11 %. Fruit size is larger and yields higher. Ripe fruit cannot withstand transportation, hence it must be harvested at half-slip stage.	15.00
	Ladyfinger (Okra)	Pusa Green (Faisalabad Selection)	Small fruited, good yielding variety with dark green, spineless fruits. Fetches better price in the market because of its colour.	10.00-11.00
		T-13	Early and prolific. Fruit is light green in colour without spines, and is slightly bigger than Pusa Green.	8.00-10.00
	Sponge guard (Tori)	Ghia Tori (Green Tori)	Eaten as vegetable at immature condition. Fruit is smooth with black & white smooth shining seeds.	12.00-15.00
		(Ball Tori)	Club shaped fruit with numerous ribbed dark seeds	

.....2.....

(1)	(2)	(3)	(4)	(5)
5.	Bottle gourd	Faisalabad No.17	Long fruited, heavy yielding variety with 23-25 cm. long fruits which are also thick.	15.00-17.00
		Desi	Medium sized round fruited cultivar.	12.00-15.00
6.	Wax Gourd (Petha)	Local	Usually used for sweets when the fruits are fully matured. When immature, its colour is green with small hairs on it. At maturity a bluish waxy layer is formed on the surface of the fruit.	17.00-20.00
7.	Brinjal	Long local (Sarhandi)	High yielding variety with long purple fruits. Best suited for Feb/March sowing.	10.00-12.00
		Round Purple (Multani)	Round purple fruits, best suited for July to October planting.	9.00-10.00
8.	Turnip	Purple Top	For early crop, seed can be produced in the Punjab but for late crops seed is imported. Upper portion of the root is purple white. The lower half is white.	20.00-22.00
		Golden Ball	Yellow coloured turnip, best suited for early crop.	17.00-20.00
9.	Carrot	T-29	Red coloured, heavy yielding variety with good taste.	20.00-25.00
		Faisalabad No.1	It is also red coloured heavy yielding variety.	20.00-25.00
10.	Tomato	Roma	A dwarf, high yielding variety with oval shaped and yellowish fruits. Very few seeds in the fruit, good for transportation, most popular among growers and consumers, better shelf life.	12.00-15.00
		Faisalabad No.1	Medium sized plant with small, round fruits in clusters. Fruit from the pedicle and is green, while rest of it is red	10.00-12.00

Contd.....P/3

(1)	(2)	(3)	(4)	(5)
11.	Potatoes	✓Desiree	Late variety with beautiful red, oval tubers with few eyes. Flesh is light yellowish. Tall foliage with reddish green leaves which are less affected by early and late blight.	18.00-20.00
		✓Cardinal	Late variety with light red skin, Plant is vigorous and tall. Tubers are big, long with few eyes which are not deep. During spring it gives better results than other varieties, frost tolerant.	18.00-20.00
		Patrones	A late potato cultivar with creamy whitish shallow eyed tubers, heavy yielder during autumn but not so well in spring or hilly crop. Better chipping quality, hence fetches better price in the market.	15.00-18.00
		Multa	A fast germinating cultivar with taller foliage. Tubers white oblong with more eyes. More susceptible to late blight and fusarium wilt.	14.00-17.00
		Ultimus	An early cultivar having red oblong tubers with deeper eyes. It is susceptible to internal brown spot disorder if harvested late in spring.	14.00-17.00
		Laal-e-Paisal	An early variety with taller foliage, tolerant to virus diseases as it shows slower degeneration. Tubers are bigger round red skinned with deeper eyes and yellow flesh, high yielder and possesses better cooking qualities.	20.00-22.00
12.	Spinach	~~Desi~~	It grows successfully in warm season. Leaves are big and thick. It is high yielding. Seeds are round.	14.00-17.00
		Kandiari	Leaves are soft, serrated and delicious in cooking. Seeds are thorny. It is low yielder and also does not fair well in summer.	9.00-12.00
13.	Cauliflower	Faisalabad Early No.1	Earliest; sown in May/June, transplanted in July & harvested in Septmber/October.	7.00-10.00

Contd.....P/4

(1)	(2)	(3)	(4)	(5)
		Faisalabad Early No. 2	Nursery planted in July, transplanted in August, harvested in November, Flowers are medium sized.	10.00-12.00
		Mid season Cauliflower	Nursery planted in August, transplanted in September. Ready for harvesting in December. Flower size is fairly large, white and compact.	15.00-17.00
		Late (Chiniot)	Nursery planted in Septmber, transplanted in October, ready for harvesting in January. Flower size is the largest compact and white.	17.00-22.00
		Snow Drift	Vary late, Sown in October/Nov. transplanted in Nov/Dec. harvested in Feb/March. Solid, medium sized white curds.	15.00-18.00
14	Cabbage	Gold Acre	Early maturing.	15.00-17.00
		Large Drum Head	Late maturing.	15.00-17.00
15.	Sweet Potato	White Star	White coloured, high yielding variety.	18.00-20.00
		Puerto Rico	Lemon coloured, high in Vit. A. On boiling tastes sweet.	18.00-20.00
16.	Peas	Metero	Earliest, dwarf with dark green pods 8-9 cm. long and 5-6 grains/pod. Round and green seeds.	5.00- 8.00
		Green Feast	[illegible] Medium matured with 8-9 cm. long pods and 6-7 grains/pod. Seeds are wrinkled and yellow.	[illegible]
17.	Radish	Desi Sufaid	Long white with green near the leaves. Good for early planting but is bitter in taste when sown early. Harvested 50 days after sowing.	12.00-15.00

Contd.....P/5.

(1)	(2)	(3)	(4)	(5)
		Shao Mai	Chinese, best suited for Aug/Sept. sowing. Ready for harvest in 40 days, white in colour with 15–20 cm length.	5.00– 8.00
		Red Round	Ready for harvest 20 to 25 days after planting, small round roots, if harverted late, become pithy. Very low yielder, not very popular.	2.00– 3.00
		Mino	A Japanese introduction. Root is 40–45 cms. long, does well in [illegible]	15.00–17.00
		Shamura	Another Japanese cultivar, root fairly long & white, popular for mid-season planting. It forms seed in the plains of Punjab.	17.00–20.00

Source :- Technical Report, Harticulture Section,
National Agricultural Research Centre,
Islamabad, 1988.

Table. 2.

ALL VEGETABLES (Excluding Potato & Sugar beet)

Year	Punjab	Sind	NWFP	Balu-chistan	Pakistan
			(Area '000' hectares)		
Avg: 1970-75	84.1	20.1	15.3	6.4	125.9
1975-76	76.7	20.6	19.6	4.0	120.9
1976-77	57.8	21.9	20.8	7.5	108.0
1977-78	65.1	24.3	21.5	7.2	118.1
1978-79	71.7	26.9	21.7	6.7	127.0
1979-80	58.5	27.9	22.0	7.2	115.6
5 Years' Avg:	66.0	24.3	21.1	6.5	117.9
1980-81	59.1	29.8	26.5	8.0	123.4
1981-82	62.1	28.4	24.2	13.1	127.8
1982-83	71.2	29.1	26.0	17.2	144.3
1983-84	76.0	29.1	24.4	20.8	150.3
1984-85	78.1	29.7	21.4	20.9	150.1
			(Production '000' tonnes)		
Avg: 1970-75	1247.3	90.4	225.2	42.9	1605.8
1975-76	1143.0	84.0	253.1	43.9	1524.0
1976-77	886.1	93.1	271.9	74.3	1325.4
1977-78	972.3	117.7	292.3	78.2	1460.5
1978-79	1086.5	131.5	294.2	74.4	1586.6
1979-80	903.2	142.2	302.4	85.1	1432.9
5 Years' Avg:	998.2	113.7	282.8	71.2	1465.9
1980-81	929.3	152.6	376.5	91.0	1549.4
1981-82	967.1	147.3	335.7	166.4	1616.5
1982-83	1058.4	155.7	352.5	236.0	1802.6
1983-84	1138.3	158.6	323.9	296.4	1917.2
1984-85	1152.3	163.3	284.7	306.0	1906.3

TABLE-2-A

Crop Targets and Productivity 1987/88-1999/2000
(Area in '000 ha, Production '000 MT)

	Benchmark 1987/88		Projections 1988-89			1999/2000	
	Area	Production	Area Growth %	Yield Growth %	Prod. Growth %	Area	Population
Oilseeds 2/	565	440	5.5	2.7	7.8	1075	1020
Horticulture	800	7150	3.1	3.6	7.0	1150	15800

Oilseeds production given in terms of oil including cottonseed oil.

Agriculture Sector 1988-2000: Alternate Development Strategies
(Production & Exports in MT unless otherwise indicated)

	Benchmark 1987/88		Projections 1999-2000			
			Present Strategy		Recommended Strategy	
	Production	Export /Stock	Production	Export /Stock	Production	Export /Stock
Edible Oil	0.44	-0.74	0.57	(-1.40)	1.02	-0.95
Fruits	3.50	-0.32	6.00	0.10	7.80	0.35
Vegetables	3.65	-0.04	4.50	0.16	8.00	0.24

TABLE 3

AREA UNDER DIFFERENT VEGETABLES IN PAKISTAN-
(1985-86)

Vegetables	Punjab	Sind	NWFP	Baluchistan	Total
Summer Crops					
Melon	7111	2074	9216	20709	29110
Brinjal	3381	703	737	302	5123
Okra	2912	1900	968	1473	7253
Squash	2208	1352	368	230	4156
Gourds	1999	394	168	329	2890
Bitter gourd	1416	436	246	130	2228
Pumpkin	758	262	273	397	1690
Tomato	-	-	2657	2369	5026
Others	20156	3596	1049	724	25527
Total :	39943	12664	15282	16663	84552
Winter Crops					
Turnip	5734	808	1134	682	8355
Radish	2335	618	639	349	3941
Carrot	4154	1698	188	334	6374
Tomato	1157	5621	1878	490	9146
Cauliflower	3837	1104	671	315	5927
Cabbage	1376	830	57	133	2396
Spinach	1842	1579	551	526	4498
Peas	3427	2526	251	203	6407
Sweet Potato	964	197	-	-	1161
Others	13375	2136	790	1238	17539
Total :	38201	17117	6156	4270	65744
Grand Total :	78144	29781	21438	20933	150296

* Melon include mustkme ermelon, cucumber, longmelon.

TABLE -4

Projected Demand for Agricultural Commodities
(Million MT)

	Base Year Demand 1987/88	Moderate Demand Projection 1993	Moderate Demand Projection 2000	High Demand Projection 1993	High Demand Projection 2000
Wheat	12.70	14.70	18.20	16.10	21.30
Basmati	0.59	0.74	1.03	0.95	1.59
Other Rice	1.47	1.67	1.98	1.97	2.44
Cotton	0.70	0.88	1.22	0.87	1.34
Sugar-Refined	1.80	2.30	3.19	2.45	4.32
Edible Oils	1.18	1.46	1.97	1.57	2.46
Maize	1.20	1.62	2.18	1.97	2.94
Millet and Sorghum	0.49	0.70	1.10	0.90	1.70
Pulses	0.74	0.90	1.05	0.95	1.25
Meat	1.25	1.70	2.63	2.25	4.20
Milk	12.70	16.47	23.00	19.76	25.52
Fruit	3.82	4.83	7.45	6.20	9.60
Vegetables	3.69	4.57	7.76	5.70	9.80

Source :- National Commission on Agriculture Report
Govt. of Pakistan, Islamabad March,1988

Table. 4-A

Area production and average yield of vegetables in Pakistan (1983-84)

Vegetable	Area (ha)	Production (t)	Av.yield (t/ha)
Melon (all types)	32,843	522,072	15.9
Okra	7,214	58,665	8.1
Squash	3,811	31,168	8.2
Brinjal	4,663	51,699	11.0
Bitter Gourd	2,305	23,364	10.1
Gourd	2,948	32,966	11.2
Pumpkin	1,568	18,482	11.8
Turnip	9,268	181,985	19.6
Carrot	5,881	93,299	15.9
Spinach	3,827	28,591	7.5
Tomato	14,134	127,206	9.0
Cauliflower	5,509	89,633	16.3
Cabbage	3,112	42,931	13.8
Sweet Potato	1,134	17,202	15.2
Peas	4,786	29,159	6.1
Radish	3,299	46,507	14.1
Potato	49,587	509,829	10.3
Others	44,124	522,719	11.8
Total	200,013	2,427,478	12.1

TABLE- 5

DOMESTIC PRODUCTION OF VEGETABLE SEEDS IN THE PUBLIC SECTOR 1986-87 (kg.)

Sr. No.	Vegetables	Amount of seed produced				
		Punjab	Sind	NWFP	Baluchistan	Total
1	2	3	4	5	6	7
A. Department of Agriculture						
1.	Water Melon	79	1	-	580	660
2.	Musk Melon	192	-	-	1070	1262
3.	Long Melon	6	-	2	-	8
4.	Cucumber	19	1	5	620	645
5.	Bottle Gourd	63	23	15	-	101
6.	Bitter Gourd	110	8	3	15	146
7.	Pumpkin	-	16	-	-	16
8.	Squash	17	-	-	2350	2367
9.	Tinda	19	10	5	-	43
10.	Okra	1022	89	205	15680	16996
11.	Egg Plant	15	32	-	240	287
12.	Tomato	19	2	3	160	184
13.	Cow Peas & Beans	386	1	-	620	1007
14.	Lufa	-	11	9	-	
	Total :	1947	203	247	21345	23742
Winter Crops						
15.	Cauliflower	196	9	3	1050	1258
16. to 17.	Cabbage, Broceli	-	-	13	190	203
18.	Carrot	280	-	5	110	395
19.	Radish	1755	6	67	2320	4148
20.	Turnip	787	5	28	7100	7920
21.	Beet-root	-	-	2	2280	2282
22.	Spinach	1757	-	101	1180	3038
23.	Mustard Green	130	-	-	-	130
24.	Pea	2299	26	83	12860	15268
25.	Lettuce	-	-	2	-	2
Condiments						
26.	Corriender	103	-	26	34644	129
27.	Onion	27	19	6	1420	1472
28.	Chillies	-	102	-	-	102
29.	Capsiam	-	-	-	50	50
30.	Fenu greek	104	-	12	800	916

TABLE 6
SEED REQUIREMENTS FOR
VARIOUS VEGETABLE CROPS

Vegetable	Area	Seed Fates (kg/H.)	Annual Requirements (kg)
Kharif			
Melons	29110	3.5	101,885
Squashes	4158	5.0	20,790
Gourds	2890	5.0	14,450
B.Gourd	2228	9.0	20,052
Pumpkins	1690	3.0	5,070
Okra	7253	25.0	181,325
Brinjal	5123	0.6	3,074
Tomato	5026	0.6	3,016
Miscellaneous	20158	6.1	122,963
		Total :	472,625
Rabi			
Turnip	8355	4.0	33,420
Radish	3941	10.0	39,410
Cauliflower	5927	1.5	8,890.5
Cabbage	2396	1.5	3,594
Carrot	6374	20.0	127,480
Tomato	9146	0.6	5,487.6
Pea	6407	60.0	122,450
Miscellaneous	187000	15.20	284,240
			999,391
		Total :	1,472,016
Condiments			
Onion	48200	10.0	482,000
Pepper	67000	3.5	234,500
Coriander	6200	20.0	124,000
			840,500

TABLE-7
DOMESTIC PRODUCTION OF VEGETABLE SEEDS
IN THE PRIVATE SECTOR - 1986-87 (Kg.)
(Rich Green Lahore)

Summer Vegetables	
Okra	16400 kg
Tomato	300 kg
Brinjal	70 kg
Total :	16770 kg
Winter Vegetables	
Cauliflower	300 kg
Cabbage	100 kg
Carrot	600 kg
Turnip	900 kg
Radish	1000 kg
Peas	200 kg
Spinach	200 kg
Coriender	200 kg
Lettuce	100 kg
Onion	1220 kg
Total :	4820 kg
Grand Total :	21590 kg

Seed Produced vs. Seed Requirements

S.No.	Vegetables	Seed produced	Required
1.	Melons	2575	101,885
2.	Squashes	2367	20,790
3.	Gourds	101	14,450
4.	B. Gourd	183	20,052
5.	Pumpkins	16	5,070
6.	Okra	33882	181,325
7.	Brinjal	357	3,074
8.	Tomato	494	8,504
9.	Turnip	8820	33,420
10.	Radish	5148	39,410
11.	Cauliflower	1558	8,891
12.	Cabbage	303	3,594
13.	Carvat	995	127,480
14.	Pea	15468	384,420
15.	Spinach	3238	112,450
16.	Onion	2692	482,000
17.	Pepper	152	234,500
18.	Coriander	329	124,000
19.	Miscellaneous	5152	407,203
		83,820	2,312,518
	Imported	2,136,373	2,220,193
		2,220,193	92,325

Summary

Total Requirement	2,220 tons or 100%.
Locally produced	83.8 tons or 3.8%.
Imported	2,136 tons or 96.2%
Total Project Requirement (Increased)	2,312 tons or 100%.
Locally produced	92 tons or 3.98%.
Imparted	2,220 tons or 96.02%.

Source :- Technical Report - Status of Vegetable Seed Industry in P... by Dr. Daud Ahmad Khan, Consultant Horticulture, PARC, ...

TABLE - 9

Approximate seed multiplication ratio

Crop/variety	Mustiplication
Broad leaf mustard	1 : 1000
Bottle gourd	1 : 32
Bitter gourd	1 : 24
Brocoli	1 : 1000
Carrot	1 : 200
Cabbage (late drum head)	1 : 1300
Cabbage (golden acre)	1 : 1100
Cauliflower (local)	1 : 600
Cauliflower (snow ball)	
Cowpeas	1 : 30
Chillies	1 : 160
Cucumber	1 : 30
French bean dwarf	1 : 15
Knolkohl	1 : 800
Onion	1 : 50
Peas	1 : 10
Pumpkin	1 : 32
Radish white neck	1 : 130
Radish mine early	1 : 80
Sweet pepper	1 : 100
Squash	1 : 20
Sponge gourd	1 : 40
Spinach	1 : 30
Tomato	1 : 200
Turnip	1 : 160
Watermelon	1 : 25

SATURDAY JULY 23, 1988 (زمانے وقت کے)

ڈپلوما کورس گل بانی و چمن آرائی

ایک سالہ ڈپلوما کورس گل بانی و چمن آرائی کے لئے موزوں امیدواروں سے مجوزہ فارموں پر درخواستیں مطلوب ہیں جو کہ زیر دستخطی کے دفتر سے دستیاب ہیں۔ داخلہ کے لئے شرائط مندرجہ ذیل ہیں۔

۱۔ تعلیم..... ایف ایس سی (پری میڈیکل یا زراعت)' میٹرک معہ سائنسی مضامین (ترجیحاً ایف ایس سی)

۲۔ عمر.....۱۶ سال سے کم نہ ہو

۳۔ سکونتی..... پنجاب

۴۔ داخلہ صرف اور صرف میرٹ کی بنیاد پر ہو گا۔

۵۔ درخواستیں معہ مکمل کوائف جمع کرانے کی آخری تاریخ ۳۰ جولائی ۱۹۸۸ء

۶۔ انٹرویو مورخہ ۴/ اگست ۱۹۸۸ء بوقت ۹ بجے صبح دفتر ہذا میں ہو گا۔ اس کیلئے کوئی علیحدہ اطلاع نہیں دی جائے گی اور نہ ہی کوئی ٹی اے' ڈی اے دیا جائے گا۔

۷۔ انٹرویو کے وقت امیدواروں کو اپنی اصل اسناد پیش کرنا ہوں گی۔

۸۔ دوران تربیت طلباء کو = /۳۰۰ روپے ماہانہ وظیفہ دیا جائے گا۔

۹۔ رہائش و خوراک کا بندوبست طلباء کو خود کرنا ہو گا۔

مزید تفصیلات کے لئے زیر دستخطی کے دفتر سے اوقات کار میں رجوع کریں۔

نوٹ..... ان امیدواروں کو جو پہلے درخواستیں دے چکے ہیں مطلع کیا جاتا ہے کہ کورس میں داخلہ کیلئے فارم جمع کرانے کی آخری تاریخ ۸۸۔ ۷۔ ۲۱ سے ۸۸۔ ۷۔ ۳۰ اور انٹرویو کی تاریخ ۸۸۔ ۷۔ ۳۰ سے ۸۸۔ ۸۔ ۴ تک بڑھا دی گئی ہے۔

مظفر علی خان

ناظم زراعت (گلبانی و چمن آرائی)

(آئی پی ایل ۶۸۱۶) ۔۔ ۲۴۳۶ ۔۔ ۲۱۔ سر سلطان محمد شاہ آغا خان سوئم روڈ (ڈیوس روڈ) لاہور