

### 3. Scope for vegetable seed production in India

India is the second largest producer of vegetables only next to China. In India vegetables are grown in 6.2 million ha with a production of 94 mt. Our vegetable requirement in the country is estimated at 225 mt by 2020. Substantial increase in yield and quality of vegetable crops depends upon a number of factors viz., quality seed, fertilizers, irrigation and plant protection measures and suitable agronomic practices. Among these use of quality seed plays a pivotal role. As per Manusmanti – an ancient Hindu Scripture, “Good seed on good land yields abundant produce” adds age-old recognition to the importance of good quality seed in crop production.

Economically, the cost of seed is less but it is realized only on possession of good quality characters. The importance of seed quality is emphasised as “seeds of hope may turn into seeds of frustration” if they are not of high quality. It is therefore, important to use the seed conforming to the prescribed standards in terms of high genetic and physical purity, physiological and health quality.

In most of the public sectors, the major concentration is on open pollinated varieties of which wheat and rice account for about 60 per cent. Majority of the promising hybrids of vegetables are from the private sector as they mostly deal with high value, low volume seeds. Thus, private companies have good scope and opportunity to sell seeds, as large area is still being sown with farm saved seeds. Private sector seed companies account for about 67 per cent of seed production and farmers keep their own seed. Government agencies including public sector corporations at the central and state hardly contribute 33 per cent of the total seed requirement. However, the estimated requirement of vegetable seeds at present is about 20,000 t for tropical and subtropical kinds and 200 t for temperate ones, which will constantly increase in the years to come. Among the vegetables, garden pea constitutes 6,000 to 7,000 t, bhendi around 5,000 t, onion 2,500 t.

#### **Annual sale of seed of Indian Seed Industry**

Indian Seed Industry ranks 6 in domestic seed sales. Value of the seeds sold in the domestic markets of India is USD 1500 million or Rs.6675 crores. The present value of

the seeds exported from India is around Rs.111.3 crores. India is at 29th place in export of seeds. This amounts to 0.35% of the world seed exports and 0.12% of the India's agricultural exports.

**World: Value of domestic seed markets (top ten countries) – 2010**

Country	Domestic Market Value
U.S.A	12000
China	6000
France	2370
Brazil	2000
Germany	1950
<b>India</b>	<b>1500</b>
Japan	1250
Italy	715
Argentina	695
Canada	550

The commercial world seed market is assessed at USD 42 billion.  
(Source: International Seed Federation – 2010.)

India is bestowed with varied agro climatic conditions / zones, experienced and dedicated farmers, viable seed industry, legislations etc., favouring the production of quality vegetable seeds. Our strengths and the weaknesses in vegetable seed production are as below.

**Strength of Indian seed sector**

- A well developed and knitted seed multiplication and distribution systems linked with several ICAR institutes / SAUs / NSC / SFCI etc.
- A network of 20 seed certification agencies at national level central & referral laboratory and 108 notified seed testing laboratories in state level to legally assure the quality seeds moving in the seed market.
- Over 6000 varieties & hybrids of different crops suitable for varied agro-climatic conditions were registered in National catalogue. This makes the selection easier for taking up production in a particular area.
- Our country is bestowed with varied agro climatic conditions, which can be exploited for taking up seed production of vegetables at any time of the year in one or other part of the country.

- Strong Network of Public & of Private stake holders of Seed Industry with Research and Development facilities
- A very fast development of private seed companies which are helpful in bridging the gap between demand and supply of vegetable seeds in the country.
- Proactive Government Policies and Programmes

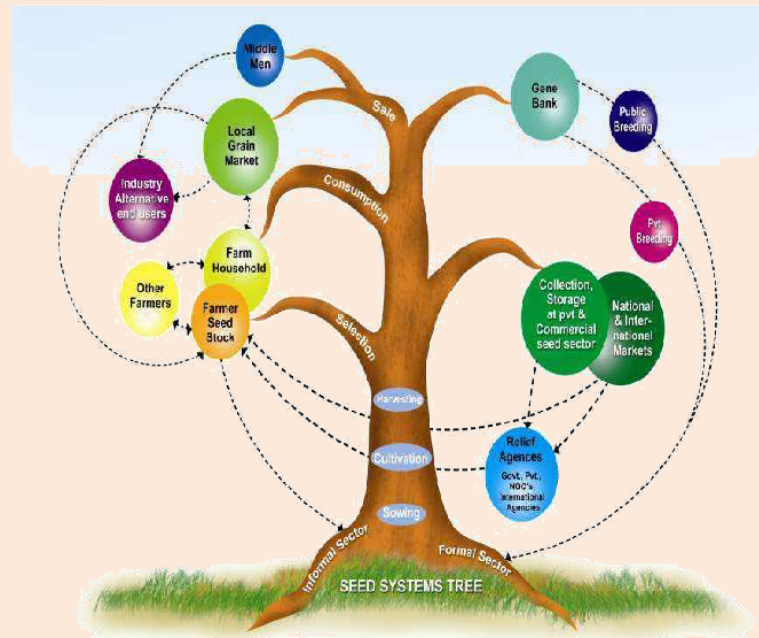
### **Weaknesses**

- Vegetable seed production in the country has been vulnerable to vagaries of weather resulting in production of poor quality seeds.
- Availability of realistic data on actual area under vegetable and requirements of vegetable seeds is inappropriate.
- There is no proper planning for cropping system and restriction for planting a particular crop, maintenance of isolation distance is difficult.
- Very low or no indents for new improved varieties due to ignorance about the performance of newly developed improved varieties.
- Non-availability of adequate nucleus and breeder seeds in the seed production chain.
- Problems in lifting of produced seeds against indents.

### **Seed improvement programmes in India**

#### **Support of World Bank to Indian Seed Programme**

The world bank supported the Indian seed programme to the amount of US \$ .7M in NSP-1, US \$ 34.9M in NSP-II, later on huge outlay was also provided under NSP-III to develop infrastructure in SSCA,SSC,NSC/SFCI STL's and NARS. Private companies also benefited from this programme by getting refinance loan from NABARD.



### National Efforts on Seed Development

- ICAR has strengthened the seed research programme through launching of special project on Promotion of Research and Development efforts on vegetables hybrids during 1992.
- Formulation of New Seed Bill 2004.
- Establishment of - NSRTC an exclusive seed quality control and Central capacity building centre.
- PPV&FR Authority for protection of Intellectual Property Rights on new crop varieties.
- Formulation of National Seed Plan - Envisages role of Central, State Govt., ICAR/SAUs, SSCs' to produce more quality seeds.
- Launching of National Seed Mission. Member of OECD, ISTA & ITPGRFA.
- 61 varieties of 19 crops included in OECD varietal list – July 201.
- Breeder Seed Production Programme: ICAR has provided revolving fund of Rs.1500 lakhs. The income generated out of revolving funds can be utilized for the development of infrastructure for the breeder seed programmes to make the programme self-sustainable.

## Strategies for seed improvement

### Exploitation of Hybrid Vigour

It is the best approach for varietal increase in production of crops. The area under hybrids is about 27 per cent while their contribution to yield is 40 per cent.

### Description of otified Varieties

The implementation of plant variety protection would necessarily require detailed characterization of all varieties. The variety registration would have on DUS criteria. Efforts are being made to characterize all the crop varieties under seed production chain.

### Enhancement of Seed Replacement Rates

The socio-economic status of the farmer does not permit to purchase quality seeds. Therefore the seed replacement rate is very low. The realistic indents and production of breeder seed of different crop varieties by maintaining quality can enhance SRR.

Seed Replacement Rate is the rate at which the farmers replace the seeds instead of using their own seeds.

#### Seed Replacement Rate of major vegetables

Crop	SRR (%)
Brinjal	63.4
Cabbage	100
Cauliflower	86.4
Chilli	83.7
Gourds	73.5
Melons	89.2
Okra	92.4
Tomato	99.3
Beans	62.2
Onion	87.3
Peas	93.5
Others	72.6

### Enhancement of Seed Multiplication Ratio

SMR is nothing but the number of seeds to be produced from a single seed when it is sown and harvested, which can be altered by adoption of proper seed and crop management techniques. However, according to expert group of seeds (1989), the seed multiplication ratios for different crops are as follows.

Crop	SMR
Okra	1:100
Tomato	1:400
Brinjal	1:450
Chillies	1:240
Watermelon	1:100
Pumpkin	1:160
Bittergourd	1:41
Bottlegourd	1:99
Ridgegourd	1:83
Cucumber	1:200
French bean	1:9
Clusterbean	1:50
Peas	1:19
Onion	1:171
Radish	1:100
Carrot	1:83

### Identification of suitable area for seed production

Diversification of seed production areas in terms of seasons and regions helps in enhancing the seed production. The search for disease free areas is much warranted to maintain seed health and also to check the spread of the disease from one area to another. Dry and cool regions could be used for effective seed storage at much lower cost and lesser risk on account of seed viability. According to Rai (1997) strategies for improvement in seed programmes are

1. Popularization of quality seed
2. Liaison between Scientists and Department of Agriculture
3. Intellectual Property Right
4. Variety Characterization
5. Strengthening of hybrid programme
6. Exploitation of CMS system for reducing cost of hybrid seed

7. Production of disease free seed
8. Seed processing
9. Packaging and storage
10. Biotechnology and bio-safety
11. Human resource development
12. Seed demand and forecasting
13. Export of seed
14. Five Generation system of seed multiplication (Nucleus – Breeder – Foundation I – Foundation II – Certified) should be strictly followed.
15. Seed Village Scheme need to be promoted.
16. Contract seed production at the farmers' field could be encouraged.
17. Providing incentives and adequate infrastructure facilities like power, irrigation, credit etc., for private seed producers
18. Seed Bank may be established to meet the demand during natural calamities.