

Production and marketing strategy of seeds for developing countries

A. K. NANDI, B. DAS AND M. SABLE

Department of Agricultural Economics
Bidhan Chandra Krishi Viswavidyalaya
Mohanpur- 741252, Nadia, West Bengal

Received: 16-10-2012, Revised: 05-5-2013, Accepted: 15-5-2013

ABSTRACT

The productivity of major food grains had been increased during late sixties in the lower and middle Gangetic Zones due to the development of seed centered technology and it received huge momentum through the exploitation of ground water during mid-eighty onwards. The major thrust of the present study is to analyze the position and possibilities of seed industry in India and its sub-continent. The efficiency of seed and other inputs are now gradually decreasing and thereby production and productivity are also in stagnant or in downing trend. The study revealed that seed replacement rate of field crops in the lower Indo-Gangetic regions are still very low and it is 18-26 per cent and for vegetables extends up to 83-99 percent with a seed cost of maximum 10 percent of total cost except potato. Productivity in farm saved seeds is always lower than replaced seeds almost both for field and vegetables. The private seed production and replication units mainly concentrated their business on high value low volume vegetable crops. The study also examined the potentiality of seed production and distribution of high volume low value crops of food grains in local and regional basis as well as the relative merits and demerits of seed and grain production of paddy based on different levels of input intensity. The participatory system of seed production and distribution in local as well as for regional level would also helpful to the producer to get the seed in time. Under good governance, the private public partnership in seed sector have to be encouraged for the minimization of productivity gap in local basis, till the availability of genetic ally improved new seeds. Protection of farmers' right has to be maintained in production and business system in developing countries. Under existing technological back up of present varieties, the Indian seed industry may capable to produce high quality seeds due to wide variability of agro ecological situations in the country.

Keywords: Farmers' right, private public partnership, production and distribution policy, seed replacement rate (SRR)

The population is increasing day by day. To feed the ever growing population we have to increase the horizontal as well as vertical expansion of agriculture. But the productivity in agricultural land is gradually diminishing during the last four decades. To increase the productivity, question of quality seed is come to the fore. But in most of the developing countries this basic input gets minimum attention to the farmer and the farmer uses farm saved seeds, without knowing the potentiality of repeated use and systems of conservation; besides this it contribute only a small part of the total cost of cultivation. On the other hand, only high quality seeds of assured genetic purity can be expected to respond fully to all other inputs. The recommended/notified and released improved varieties of seeds must be available to the farmers well in time in sufficient quantity so that the planting schedule is not disturbed. The cost of such high quality seed should moreover be within the reach of average farmer. Therefore, seed production and marketing is a vital activity controlling the supply and price of seeds for the enhancement of production and productivity.

After the liberalization in the new policy on seed development (1988) the private company has already been entered in Indian seed industry but they usually engaged in production and distribution of low volume seeds for horticultural crops. Due to lack of short duration quality seeds of field crops it is difficult

to adjust the cropping pattern to accommodate the seasonal horticultural crops. Therefore, seed production and marketing is a vital part of any development programme in the seed industry. The availability of seeds of improved varieties from multiplication field is of no value if it does not reach the farmers or seed growers before sowing. On the other hand, it is not one time affair. For sustained increase in agricultural production it requires continuous development of new and improved varieties of seeds and efficient system of supply to farmers with an effective marketing organization.

Considering the above mentioned phenomenon the present study aims to examine the present status of Indian seed industry; possibilities of high volume seed production to adjust high value horticultural crops; to assemble the farmer's reaction about the availability and use of quality seeds and to formulate the marketing strategy and guidelines for sustaining the seed industry.

MATERIALS AND METHODOS

Apart from the secondary information, the primary data has been collected from forty participatory seed growers organized by registered seed grower cooperatives and another set of forty general farmers from the two blocks of Nadia districts of West Bengal based on 2007-08 crop year. Regarding the comparative advantage of cost, the

Cost D concepts (Krishnaji, 1975) have been used due to the short run production system. To find out the critical gap in the strategy of marketing, the system of SWOT analysis (Crosbie and Knight, 1995) has taken as a tool of future development interrogating with the selected growers, scientists, seed distributors and different officials associated with the system. Seed replacement rate (SRR) means the ratio of quantity of quality seeds sown in a particular year and quantity of seed required for the entire area under a variety or crop multiplied by hundred.

RESULTS AND DISCUSSIONS

Section-I: Status of seed industry

It has three distinct subsystems.

Research and development

In India, it is primarily confined to the public sector and is carried out at 39 central research institutes and 25 State Agricultural Universities (SAU). Fifteen central research institutes are actually involved in research related to crop production and protection including breeding. The research is carried out on two types of projects, namely, All India Coordinated Crop Improvement Project (AICCP) and ad hoc research projects. The private sector was generally conservative towards investment in research. But of late their attitude has been changing and a few private seed companies who have invested in research were successful in developing some 122 varieties or hybrids mainly of vegetable crops, millets, sunflower and sorghum.

Seed multiplication

It is done under contract between companies or corporations and farmers. The National Seed Corporation (NSC) apart from contract growers also gets foundation and certified seed multiplied at the farms of State Farms Corporation (SFC). But the private sector seed enterprises have to rely on contract growers for production of certified seed to release varieties and truthfully labeled seed of their own varieties or hybrids.

Seed distribution

The marketing of seed was done through a network of dealers and distributors who operate on a commission basis. Normally distributors obtained a commission of 15 to 20 percent of which 12 to 17 percent was passed on to the dealers and dealers in turn passed on 9 to 4 percent to the retailers. The quantum of seed distribution has increased from 80 lakh quintals to 192 lakh quintals in 2006-2007 (Table 1), and it covers only 15 percent of the total requirement considering the existing seed replacement rate.

A breakthrough has been achieved after 1998 when the government lifted the ban on the private sector companies on the import of seeds. The private sector accounts for 70 % of the market turnover where as the public sector has the greater share in terms of

volume seeds. The estimate of turnover (\$900 m.) is less than 2 percent of the global seed business (Rawat, 2002).

Table 1: Production and distribution of certified seeds

Year	Breeder seed ('000 q)	Foundation seed (lakh q)	Distributed certified seeds (lakh q)
1996-97	43.72	6.45	79.01
2000-01	44.24	5.77	86.41
2004-05	66.46	6.90	120.26
2005-06	64.88	7.40	126.74
2006-07	73.83	8.00	191.98

Table 2: Changing share of private and public sector in seeds production

Year	Share in seed production	
	Private (%)	Public (%)
2004	49.11	50.89
2005	58.00	42.00
2006	57.75	42.26

Source: XI Five Year Plan (2007-12), Planning Commission. Govt. of India (2008)

Section-II

To judge the potentiality of high volume seed production and the contribution of seed cost and yield differences of farm saved/local unbranded varieties with replaced seeds a detail survey has been conducted from the participatory seed producer for both type of production system and the farmer's reaction towards the availability of quality seeds well in advance. It is observed from the Table-3 that, the proportion of the seed cost to total cost of cultivation of the crops are very negligible and in case of field crops the farmers mainly devote only a negligible amount but on the other hand in case of vegetables the seed replacement rate is higher than the cereals. The yield from the farm saved /local seeds are lower both in field as well as selected vegetable crops in the surveyed region. From the above discussion one may safely conclude that where the replacement rate is higher the yield is also higher.

Considering the paddy as a staple food crop in the selected region the information have also been collected on cost and return and the intensity of input use for both seed and non-seed production from the sample farmers to discern the potentiality in local or regional basis of high volume paddy seeds and tabulated in table-4. From the table it is clear that the unit cost of production of paddy for seed purpose is higher than crop grown for consumption purposes (non-seed). Although the productivity is low in case of paddy crop grown for seed purpose, the net return per ha is higher due to higher market price as well as demand for seeds in the local market.

Table 3: Comparison of yield rate of farm saved seeds and replaced seeds and share of seed cost to total cost for major crops during 2007-2008

Crops	SRR (%)	Seed rate (kg/ha ⁻¹)	Seed cost (%)	Yield (ha ⁻¹)	
				Farm saved /local	Replaced each year
Paddy	25.1	45.24	6.27	57.79	71.20
Wheat	18.0	82.52	10.42	50.58	63.24
Jute	26.0	6.23	2.45	28.51	38.44
Potato	NA	18.35	23.63	290.18	345.13
Cabbage	100.0	0.50	8.26	380.37	370.26
Cauliflower	86.4	0.75	9.21	190.23	230.47
Chillies	83.7	0.50	1.87	68.21	85.73
Okra	92.4	12.5	2.70	140.55	230.87
Tomato	99.3	0.35	10.11	344.50	464.97

So, it can be concluded that if proper training and guidelines for seed production technology are given to the farmers, they will be interested to grow the crop for seed purpose and it will meet the demand for seed in local or regional basis which ultimately increased the aggregate production and minimized the high volume low value seed production (Tripathy, 2006).

On the other hand, the agro-entrepreneur from rural educated youths would be developed based on seed production, certification, distribution and marketing of high volume seeds and it increased the availability of the same in time and extends the scope of high value crops like vegetables as a second option. The intensity of input used has been displayed to discern the sustainability of the seed production system and it clearly indicates the lower level of external input like nutrients, plant protection chemicals, and seeds also except the human labours. So this additional number of labour enhances the employment opportunity in the locality. Moreover, the wage rates for the technical staffs are higher than the traditional wages.

Table 4: Economics of high volume paddy seed and non-seed production of the selected area during 2007 -08

Item	Seed	Non – seed
Total cost (Rs. ha ⁻¹)	19237.97	19164.75
Total Return (Rs. ha ⁻¹)	72960.00	23940
Net Return (Rs. ha ⁻¹)	5384.03	4775.25
Productivity (q ha ⁻¹)	36.48	41.04
Cost of Paddy q ⁻¹	527.35	444.56
Human Labour (man-days)	134	107
Seed Requirement (q ha ⁻¹)	50	65
Nutrients	100-50-50	70-30-30
PPC (Rs. ha ⁻¹)	2622	5073

Thus additional employment and higher wage rate will enhance the income of the rural youth in land scarce situation which is important for labour surplus economy in the transition agriculture.

Farmer's perception

An opinion survey has also been conducted for getting farmers reaction as well as total perception

regarding the availability of quality seeds. It is observed from the table-5 that 87 percent of the farmers are aware about high quality paddy seeds, 67 percent of the farmers faces the non-availability of the quality seeds. In a study Rao (1998) reported the awareness about the quality seeds among the Indian farmers are tremendously increasing. Nearly 72 percent of the farmers are interested to pay 20 percent premium price, in case of 80 percent of the farmers cost of production is increasing and productivity is decreasing, 52 percent of the farmers opined to production risk of replaced seed and 75 percent of the farmers needed training for paddy seed production.

Table 5: Farmer's perception on availability of quality seeds

Perception	No. of farmers
Awareness on high quality seeds	70 (87)
Lack of availability of quality seeds to adjust the cropping pattern	54 (67)
Interested to pay 20% premium price	58 (72)
Cost of production is increasing and productivity is decreasing	64 (80)
Production risk of replaced seed	42 (52)
Training needs for paddy seed production	60 (75)

Note: The figures inside the parenthesis indicate the percentage value

Section-III (Seed marketing and export)**Strategy for sustainable market development**

It covers all activities involved in the flow of seeds from production to consumption, i.e., from the first multiplication stage of the source or basic seed material up to the distribution of the converted end product, multiplied to adequate quantity, to the farmers. Organized marketing of seed would aim at providing the farmer with adequate quantity of high quality seed of the best varieties so that, he may fully exploit the results of research on crop improvement

and cultivation. Interacting with different functionaries in the seed market the critical gap has been analysed within this section with the help of Strengths, Weakness, Opportunities and Threats (SWOT) tools which are extremely useful for market development.

Table 6: Strategy for sustainable development

Strengths		Weakness	
Internal		Internal	
Research and Development skill.	Commitment to improve performance. Financial strength.	Lack of commitment.	Control over distribution and distributors.
External		External	
Shift of production technology in a rational and systematic way.		No consensus within the seed producer and distribution to find out the road map of seed production.	Lack of Govt. commitment to develop the consensus.
Opportunity		Threats	
Internal		Internal	
Development of cost effective technology.	New variety and type have benefits in cost effectively and productivity.	Potential resistance from multinational seed company due to loss of their business plan.	
External		External	
Anticipated high demand for quality seed.	Collaboration and development of partnership.	High transportation cost.	Distribution channel is not connected property to reach the farm level at adequate time.

The simplest and most efficient system, out of a number of possible ways in which marketing network could be organized is to establish a sound central marketing cell distributing seed to several channels through regional officers in the target end-use areas. From the above table it is clear that the institutional approaches are the top most priority to develop the seed industry as a whole. External market

The Indian seed companies mainly depend on domestic markets. So the potentiality was not yet tapped. With the arrival of MNCs this situation is now changing. Due to the divergence in agro climatic situation and large number of scientific manpower and availability of labour force in near future the country will export the seeds to the African countries. Though the US is the leading seed exporting country, India is also exporting to US and they are the trading partners of vegetable seed. Japan is also another trading partner and importing \$ 1 million of vegetable seeds from India (Rai, 1998). Table-7 reveals the negligible amount of export but the size of tropical

seed market is estimated to be more than Rs.1000 crores if proper planning can be done with private-public partnership (Kataria, 2002).

Table 7: Seed export of main exporting countries (million US\$)

Countries	Agricultural crops	Horticultural crops	Total
US	500	200	700
Netherlands	420	200	620
France	432	100	532
Brazil	192	1	193
India	NA	NA	23

Source: Seed Association of India (2002)

The private seed industry has an important role in the production and supply of quality seeds. This clearly emphatically envisaged in the National seed policy (2002) also. Although the public sector is dominant in seed development, production and distribution system for high volume and low value crops, the private sector is playing a leading role in high value and low volume crops like vegetables, flowers, horticultural crops, hybrids of some cereals and cash crops and genetically modified seeds. The seed industry is developing rapidly and it needs expansion. Therefore, there is a need for synergy between the public and the private sectors. The existence of cooperative for high volume seed production with a participatory approach is also useful to minimize the cost and resource effective as well as availability in time to the user. In a labour surplus economy it will develop rural entrepreneur in seed sector. The institutional effort is required on overall national objective for providing quality seeds including those of high volume low value crops to the farmers at affordable prices.

REFERENCES

- Anonymous. 2002. *National Seed Policy*. Department of Agriculture and Cooperation, Government of India, New Delhi.
- Anonymous. 1988. *New Policy on Seed Development*. Department of Agriculture and Cooperation, Government of India, New Delhi.
- Anonymous. 2008. *Eleventh Five Year Plan*. Vol.-III, Planning Commission, Government of India, pp. 16-17.
- Crosbi, L. and Knight, K. 1995. *Strategy for Sustainable Business*. Mc-Graw Hill Book Com., pp. 123-24.
- Kataria, A. S. 2002. Seed Special. *Agriculture Today*, pp.11.
- Krishnaji, N. 1975. State Intervention and Food Grain Prices. *Social Scientist*, Jan-Feb (Sp.), pp. 85.
- Rai, M. 1998. Role of Seed in Agricultural Transformation in India. *Agro India*, pp. 26-28.
- Rao, Y. 1998. Improvement of use of Quality Seed at Farmers level. *Agro India*, pp. 38.
- Rawat, V. 2002. Seed industry. *Agriculture Today*, 6 – 12, pp. 14-21.
- Tripathy, T. 2006. Tent of Production, Adoption and Utilization of High Quality Paddy Seeds, *Indian J. Agril. Econ.*, 61: 90.