

## New Indian Seeds Bill: Stakeholders' Policy Advocacies to Enact

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The new Seeds Bill was introduced in the parliament in 2004. The extent of dissent among various stakeholders is evident from the fact that the Bill is not enacted into an Act even ten years after its first introduction in the parliament. If Seeds Bill has to be passed into Seeds Act, it is imperative that contentious issues have to be amicably resolved and settled. Hence, it is important to understand the concerns and priorities of all those associated with Indian seed industry. In this context, this study was aimed at identifying the priorities of various stakeholders with respect to Indian seed legislation. The study was conducted in Andhra Pradesh (AP) and Bihar involving six sets of stakeholders: 240 farmers; and 30 respondents each from State Departments of Agriculture; Researchers from ICAR and SAU's; NGO's; Seed dealers and Private Seed Companies (PSCs). Total sample size for the study was 390.

Farmers' expectations from the new Seeds Bill were to protect and uphold their traditional rights over seeds. This priority was implicit for farmers irrespective of their awareness and knowledge on laws that protected and upheld these rights such as PPVFRA 2001. Farmers' dependence on formal seed market and consequent demand for availability of quality seeds at affordable prices has increased. Government's focus on increasing Seed Replacement Rate must be preceded with strict quality control regime in production and distribution of certified/quality seeds. Farmers also demanded for strengthening and incentivizing informal seed production and distribution system which accounts for upto 80 per cent of seed distributed in the country. Speedy and efficient compensation mechanism needs policy attention. The priorities of NGOs and Agriculture Department Officials (ADOs) were similar to those of farmers. However, ADOs believed that strengthening of public sector seed R&D, production, certification, testing, quality control and distribution system was the most priority area. There is a great degree of agreement among farmers, NGOs, ADOs and researchers that State governments ought to be granted enough powers to regulate seed industry in their respective states including powers to regulate sale price of and trait fee over seeds, to pay compensation and to take strict punitive and accountability measures. Development of new cultivars and production and distribution of quality seed were the priorities of researchers. Seed dealers expressed that measures to strengthen market infrastructure and curbing market malpractices need utmost attention. PSCs' priorities were completely different and even conflicting with those of farmers and other stakeholders. Their concerns were deregulation of seed prices, liberalization of Indian seed sector including nil/least market intervention by government, access to germplasm available with public sector, PPP to market public-sector bred cultivars, self-certification of seed and single window mechanism to oversee the clearance of transgenic crops.

When compared with farmers' priorities, the PSCs differed significantly on all twelve contentious issues; researchers and seed dealers on eight issues and ADOs on five issues. NGOs priorities were similar with those of farmers on eleven issues. Issues such as regulation of seed sale price and royalty fee, compensation mechanism, granting powers to State governments, strengthening public and informal seed systems are the common issues on which there is general agreement by all stakeholders except PSCs. These issues need to be addressed in the final draft of the bill before it is enacted into Seeds Act.

**Keywords:** Compensation, farmers' rights, price regulation, punitive and accountability measures, quality control, self-certification, trait fee.

Seed is the basic and most critical input for agriculture. The response of all other inputs depends on the quality of seeds to a large extent. The Royal Commission of Agriculture (established in 1928) was

the first body to recognize the necessity of the high quality seed. In seeking to promote the agriculture, Royal Commission placed emphasis on the production and distribution of the quality seed.<sup>1</sup> It is estimated that the direct contribution of quality seed alone to the total production is about 15-20%

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depending upon the crop and it can be further raised up to 45% with efficient management of other inputs.<sup>2</sup> India has enacted seed legislations from time to time to address the challenges of regulating production and distribution of quality seeds to farmers. The Seeds Act, 1966 was enacted to regulate the quality of certified seed meant for sale. The Act consists of three important provisions: a) seed certification, b) seed inspection, and c) seed testing. Each of these is important by itself and at the same time, they mutually reinforce each other. This 1966 Act regulates only notified kinds and varieties of seeds. It became operational with the enactment of the Seeds Rules in 1968. Amendments to the Seeds Act and Rules were introduced in 1972, 1973, 1974 and 1981. Seeds were declared as an essential commodity under Essential Commodities Act, 1955 and the Seeds (Control) Order was issued in 1983. It has provisions such as compulsory licensing of the seed dealers, price control, seed movement control and submission of the information about the procurement and sale of seed. Seeds (Control) Order became enforceable only from July 1994 owing to litigation in law court. New Policy on Seed Development (NPSD) 1988 liberalized Indian seed industry. Until the late 1980s, private firm participation in the seed industry in India was limited by two factors: economy-wide policies that restricted foreign investment and licensing, and seed-specific policies that limited the sector to 'small scale' participants and severely restricted imports of research or breeder seeds. With India's implementation of the Seed Policy of 1988, the 'small scale' limitation was removed, large domestic and foreign firms were permitted entry, and import restrictions were substantially lifted. Economy-wide liberalization occurred in India in 1991, including the abolition of the industrial licensing system and the easing of restrictions on foreign direct investment (FDI).<sup>3</sup> As a result of the reforms, new foreign and domestic firms entered the market, competition increased, and private sector R&D expenditures grew rapidly as domestic firms spent more on technology to compete with the entry of new research-intensive foreign firms. Another important motivation for firms' increased R&D expenditures has been the market's transition away from open-pollinated varieties (OPVs), which farmers can save and reuse in subsequent years, to hybrids, which cannot be reused without a significant reduction in yield and quality. Farmers' need to purchase seeds each year enable

firms to recoup R&D investments.<sup>3</sup> The value of Indian domestic seed industry increased from Rs. 600 crores in 1988 to Rs. 10,000 crores in 2011, which illustrates the tremendous growth of organized seed sector in India after implementing NPSD 1988. The share of value of proprietary hybrids in Indian seed market increased from 16.66% in 1988 to 28.26% in 1999 and to 60% in 2011.<sup>4</sup> NPSD 1988 initiated and incentivized the process of privatization of Indian seed industry. The fact that from 1984 to 1995, 50-60% of the seed requirement was met by the private sector and in 2010 it was estimated that 80% of turnover in seed business came from private companies establishes the dominance of private seed companies at present.<sup>5</sup> Within the formal sector, the composition of the seed industry, by volume of turnover, has reportedly reached a ratio of 60:40 between the private and public sectors.<sup>6,7</sup> The dramatic growth in private sector R&D and innovations appears to have five major causes: market demand, policy liberalization, advances in basic science and engineering, intellectual property rights, and government investment in research and education.<sup>8</sup> Signing of WTO in 1995 by India further paved the way for private research and development of varieties. The Protection of Plant Varieties and Farmers' Right Act (PPVFRA) 2001 was formulated for protection of plant varieties in India by integrating the rights of breeders, farmers and village communities. However, hybrids developed by private seed companies accounted for 90 percent of new varieties which received PVP certificates (Certificates of Registration).<sup>9</sup> This illustrates that technological barrier to realization of farmers' rights is more profound in India than the legal barrier as in case of developed countries. It also highlights the chasm in *de jure* and *de facto* of protecting and upholding farmers' rights in India. Farmers' rights have no meaning in case of hybrids since technical barriers limit farmers from saving and reusing these seeds. This is a threat against farmers' rights in the context wherein Indian seed sector is getting privatized and PSCs are interested in developing and marketing hybrids.

Seed industry in India at present is regulated through Seeds Act 1966, Seeds (Control) Order 1983 and the NPSD 1988. However, far reaching changes have taken place in the national economy and agricultural scenario and in the international environment since the enactment of these legislations.

Biotechnology sector came up with promises of extremely productive genetically modified (GM) crops. In 2002, Government of India approved *Bt* cotton for commercial cultivation in India. National Seeds Policy was thus formulated in the year 2002, to provide an appropriate climate for the seed industry to utilize available and prospective opportunities, safeguarding the interests of farmers and conservation of biodiversity. Liberalization has been targeted towards certain components of the policy retaining regulation to some components to safeguard national interests.<sup>10</sup> China significantly limits the market access of foreign firms, while India has liberalized its seed sector and permits foreign and domestic firms to participate on equal terms. However, price restrictions implemented by Indian state governments severely limit the ability of all firms to charge market prices for biotech seeds.<sup>11</sup> Even with significant price controls, however, India's seed market is more liberalized than that of China. Despite the enactment of a seed law in 2000 creating a role for private firms, China continues to severely restrict FDI and the trading of certain types of seeds.<sup>12</sup>

The aims of National Seeds Policy such as development of infrastructure, ensuring supply of good quality seeds and facilitating the international seed trade are sought to be addressed through the proposed Seeds Bill 2004, which seeks to repeal and replace the existing Seeds Act 1966. Since the enactment of the 1966 Seeds Act, far-reaching changes have occurred in the agriculture and horticulture areas with crop diversification and biotechnology emerging as vital elements of such change. Building of a conducive environment for enhanced investment in research and development and quality seed production including application of frontier sciences are sought to be established under the present Seeds Bill, 2004.<sup>13</sup> The new Seeds Bill was introduced in the Parliament on 9 December, 2004. Various stakeholders raised serious objections on several provisions made in the bill and sought suitable amendments. The stakeholders include farmers; farmers' organizations; political parties and their farmers' wings; Members of Parliament; researchers and academicians in National Agriculture Research and Education System (NARES: mainly comprising ICAR and State Agriculture Universities); State agriculture departments dealing with seed production, testing, certification and distribution; Central and State seed production agencies such as

National Seeds Corporation, State Seed Corporations, State Seed Certification Agencies, etc; NGOs/Civil Society Organizations; Private Seed Companies and their associations; seed retailers and dealers. These stakeholders have different and contradictory views on several clauses in the Seeds Bill 2004 relating to important issues such as: 1) Farmers' Rights, 2) Powers to State governments, 3) Regulation of sale price of seed, 4) Regulation of trait/royalty fee, 5) Compensation issues, 6) Punitive and accountability clauses, 7) Registration and parentage issues, 8) Certification of seed, 9) Import of seeds, etc. among other issues. Hence, the Bill was referred to Parliamentary Standing Committee on Agriculture (PSCA) to study and submit its report. The Committee, before going into detailed examination of the Bill invited written memoranda from Agricultural research institutions and universities, National and state level seeds corporations, Private Seed Companies, scientists, experts, farmers' organisations, NGOs and other interested groups/individuals their views/suggestions/comments on the Bill. Seventy memoranda were received, based on which representatives from seven organizations were called in to give their expert comments on various clauses of the Bill.<sup>14</sup> Based on consultations and discussions with various stakeholders, the Committee submitted its report on 20 November 2006 and recommended for major changes in the original Bill. Government of India accepted some of the amendments to the Seeds Bill 2004 and notified the Seeds Bill 2010 draft on 13 April, 2010. Later, on 23 April 2010, the Ministry tried to place the revised and newly redrafted Seeds Bill 2010 in Rajya Sabha but could not do so. The Bill was stalled because several MPs protested in Parliament for not including clauses related to regulation of sale price and trait fees over seeds even though Parliamentary Standing Committee on Agriculture (PSCA) recommended for the inclusion of these clauses in the final draft. The extent of dissent among various stakeholders is evident from the fact that the Bill is not yet enacted (into an Act), even ten years after its first introduction in the parliament. The dissent is because of different and often conflicting interests and priorities of various stakeholders associated with Indian seed industry including farmers, Public sector seed R&D institutions (ICAR and SAUs), central and state seed organizations (National Seeds Corporation, State Farms Corporation of India, State Seed Corporations,

State Seed Certifying Agencies, Seed Testing Labs), State Departments of Agriculture, NGOs, seed dealers and retailers and Private seed companies.

In this context, it is of importance to understand the priorities of various stakeholders. The specific objectives of this research paper are:

- a. To identify the priorities of various stakeholders with respect to Indian seed legislation;
- b. To determine the extent of agreement and disagreement among various stakeholders on contentious issues; and
- c. To suggest suitable amendments to the Seeds Bill based on the study.

## Materials and Methods

**Research Design:** An *ex-post facto* and survey research design was adopted for the study.

**Locale of the Study:** Two states namely Andhra Pradesh (AP) and Bihar were selected purposively for the study based on the criteria of high and low Seed Replacement Rate (SRR) respectively for various crops. Two districts from each state namely, Warangal and Anantapur districts in AP and Samastipur and Vaishali districts in Bihar were selected purposively based on the criteria of maximum area under seed production and maximum number of stakeholders associated with seed industry. In each district, one tehsil/mandal was randomly selected and further two villages in each tehsil/mandal were randomly selected. Thirty farmers from each village were randomly selected for personal interview.

**Sample and Sampling Procedure:** The sample consisted of six sets of stakeholders including 240 farmers; 30 respondents each belonging to State Agriculture departments of Andhra Pradesh and Bihar; researchers from State Agricultural Universities and ICAR Institutes; NGOs; seed dealers from AP and Bihar; and private seed companies located in AP and Bihar. The farmers were selected using multi-stage stratified random sampling, whereas rest of the stakeholders were selected purposively based on their expertise and experience in either or combination of seed R&D, production, certification, testing, distribution, marketing and seed related Intellectual Property Rights. Total sample size for the study was 390.

Respondents from State Agriculture Departments included officers from Bihar Rajya Beej Nigam,

Bihar State Seed Certification Agency, AP State Seed Development Corporation, AP State Seed Certification Agency, Seed testing laboratories (Quality Control Laboratories); Assistant Directors of Agriculture, Agriculture Officers and Assistant Agriculture Officers involved in distribution of seed (including subsidized seed) through agriculture office at tehsil/mandal level.

Researchers included scientists from ICAR institutions (IARI, New Delhi and its regional station, Pusa, Samastipur; National Bureau of Plant Genetic Resources, New Delhi; Indian Institute of Agricultural Economics and Policy Research, New Delhi; Indian Institute of Maize Research, New Delhi; Central Research Institute for Dryland Agriculture, Hyderabad; National Academy of Agricultural Research Management, Hyderabad; Indian Institute of Rice Research, Hyderabad; Indian Institute of Millets Research, Hyderabad; Indian Institute of Oilseeds Research, Hyderabad), SAUs (Division of Seed Science and Technology, Seed Research and Technology Centre, ANGRAU, Hyderabad; Seeds Farm, Rajendra Agricultural University, Samastipur, Bihar) and National Seeds Corporation, New Delhi. Majority of the researchers interviewed were seed technologists/ plant breeders/ biotechnologists involved in seed research, production and distribution of breeder, foundation and certified seeds of varieties/hybrids developed by their institutes/ organizations. Some researchers were experts in issues such as IPR issues in seed and farmers' rights. Researchers were interviewed in Hyderabad, Pusa, Samastipur and Delhi.

Civil Society Organizations (CSOs) involved in the study included NGOs and Farmers' organizations which were actively involved in discussions and debates on Seeds Bill and policy advocacy. These organizations met Union Agriculture Minister, Prime Minister, several MPs and submitted memoranda for bringing several amendments and inclusion of several clauses in the final draft of the Bill. These organizations also participated in several meetings and public discussions organized by Parliamentary Standing Committee on Agriculture constituted to look into contentious issues in Seeds Bill and to suggest suitable amendments. Representatives of CSOs were interviewed in Hyderabad and Delhi.

Representatives of PSCs were interviewed in Hyderabad, Patna, Samastipur and Delhi. Seed dealers were interviewed in Samastipur, Hajipur (district

headquarters of Vaishali district), Warangal and Anantapur. Seed dealers contacted for the study also sold other agriculture inputs such as pesticides, fertilizers and bio-fertilizers.

Farmers were selected using multi-stage stratified random sampling technique. Two blocks in each district were selected randomly in each of the four districts. In each block, two villages were selected randomly. Thirty farmers were selected randomly and interviewed in each village thus making a total sample size of 240 farmers. The list of districts, blocks and villages from where farmers were interviewed is provided in the Table 1 below.

**Data Collection Tools and Analysis:** The exhaustive list of contentious issues with regard to Indian seed legislation was prepared based on extensive review of literature and discussion with experts and stakeholders during a pilot study. The data was collected in the year 2012 (from February to August) by personal interview and focussed group discussion methods using a semi-structured interview schedule developed separately for each set of stakeholders. Respondents were asked to rank various contentious issues based on their needs and priorities. Garrett ranking technique was used to rank the priorities of each set of stakeholders. As per this method, respondents have been asked to assign the rank for all factors and the outcome of such ranking has been converted into score value with the help of the following formula:

$$\text{Percent position} = \frac{100(\text{R}_{ij} - 0.5)}{N_j}$$

Where  $R_{ij}$  = Rank given for the  $i^{\text{th}}$  variable by  $j^{\text{th}}$  respondent.

$N_j$  = Number of variables ranked by  $j^{\text{th}}$  respondent. In the study  $N_j = 10$ .

With the help of Garrett's table, the percent position estimated is converted into scores. Then for each factor, the scores of each individual are added and

then total value of scores and mean values of score is calculated. The factors having highest mean value is considered to be the most important factor.

A non-parametric test called Mann-Whitney U test was employed to determine statistically the degree of agreement and disagreement among various stakeholders. All the contentious issues were grouped under twelve broad issues. The perception of all the stakeholders on these twelve issues was obtained using a five-point rating scale of importance that the respondent gives to each of the issues: 'Most Important', 'Important', 'Somewhat Important', 'Less Important', and 'Least Important' with a score of 4, 3, 2, 1 and 0 respectively. Mann-Whitney U test compares two samples and hence requires equal sample size for both the sets. Hence, 30 farmers (15 each from AP and Bihar) were randomly selected from the total sample size of 240. Here, the sample of farmers was compared with each of the other five samples of stakeholders on their perceptions of importance given to each of the twelve contentious issues. Mann-Whitney U test was employed to measure statistics for all the twelve contentious issues and for all sets of samples to test if the farmers differed from the other sets of stakeholders in their perception of the various issues. The test was employed at 0.01 and 0.05 probability level to test if the differences among the stakeholders were statistically significant.

## Results and Discussion

The results of the study are discussed under two sections:

### I) Priorities of Various Stakeholders with respect to Indian Seed Legislation

The priorities of each set of stakeholders are discussed in the following section:

#### *Priorities of Farmers*

Priorities of farmers and their Garrett rankings are provided in Table 2. There was no statistically significant difference between the farmers of Andhra Pradesh and Bihar with respect to priority

Table 1—List of villages selected for interviewing farmers

State	Districts	Blocks (tehsil/mandal)	Villages
Andhra Pradesh	Anantapur	Vidapanakallu	Vidapanakallu, Gadekallu
	Warangal	Raghunathapally	Satyanarayanapuram, Cherla Thanda
Bihar	Samastipur	Pusa	Madhapur Chapra, Mahammada
	Vaishali	Hazipur	Dharampur, Bindupur

Note: Presently, Warangal district is part of newly carved out Telangana state. Hyderabad, earlier the capital city of AP is presently the capital of Telangana state.

Table 2—Priorities of farmers		N = 240	
S. No.	Issue	Mean score	Rank
1	Protecting and upholding farmers' rights	79.71	I
2	Availability of quality seed in sufficient quantities	67.17	II
3	Strengthen informal seed supply systems	61.75	III
4	Seed sale price regulation mechanism	51.85	IV
5	Compensation issues	51.73	V
6	Powers to State governments	44.71	VI
7	Stringent punitive and accountability measures	44.08	VII
8	Strengthen public sector seed agencies	35.90	VIII
9	Check malpractices in the seed market	31.17	IX
10	Seed crop insurance	30.94	X

Note: There was no statistically significant difference between the farmers of Andhra Pradesh and Bihar with respect to priority issues. Hence, they were clubbed as one homogenous group for the study.

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Farmers are the principal stakeholders of agriculture. Any law that affects agriculture needs to be first and foremost looked from the viewpoint of farmers. It is more so with the seed legislations since seed has traditionally been the property of farming community. Hence, protecting and upholding farmers' rights over seed without any legal hindrance was the most important issue for farmers. It is to be noted that majority of the farmers were unaware of the farmers' rights protected through PPVFRA 2001, but when they were explained about the violation of farmers' rights in the Seeds Bill draft 2004, they expressed that protecting farmers' rights over seed by the government was paramount to its responsibility of production and supply of quality seeds. Farmers' rights over seed were implicit for all the farmers, irrespective of their awareness and knowledge on laws that protect and uphold these rights, such as PPVFRA, 2001.

Though availability of certified/ quality seeds of various crops in the market has increased over the decades, quality assurance is still an issue. Timely availability is the greatest issue when it comes to government subsidised seed programmes.<sup>15</sup> Farmers in Bihar also reported that seeds distributed under subsidy schemes by State Department of Agriculture were always supplied late by at least one week. There are no mechanisms to ensure that the seed purchased from market gives expected performance as promised by the seed supplying organizations. The farmers in

Bihar complained that seeds of some crops such as wheat, paddy, maize, etc., were available in plenty since many stakeholders (public, private and farmers themselves) were involved in seed production of these crops, but seeds were always in shortage for some groups of crops like pulses, oil seeds and forage crops. The shortage of seeds in some groups of crops and complete dependence on market for some other groups of crops highlights the lack of planning and coordination among various seed producing organizations in the formal seed sector. Farmers and farmers' organizations expressed that the answer to this problem lied in strengthening the informal seed production and distribution systems. It is important to note that even in the present scenario, the formal seed sector (including both private and public sector companies) meets only 15-20% of the seed requirement of the farmers.<sup>16</sup> Remaining 80-85% of seed requirement is being met by informal and farmer-to-farmer seed exchange mechanisms. Although the Indian seed market is one of the largest, it is almost exclusively supplied by locally produced seeds. For example, 50 and 60 per cent of the farmers in Bihar and Madhya Pradesh use farm-saved seeds, as against 28-30 per cent in Punjab and Haryana.<sup>17</sup> More than 70 per cent seed usage in India, particularly for food crops is through the farm-saved seed. Private seed industry is well built only for selective crops and public seed organizations also cater to a few kinds of seed only.<sup>18</sup> Studies made by several researchers clearly indicate that with high-volume low-value seeds, such as wheat, groundnut, soybean and chickpea, 80 per cent of the cropping area is sown with farm-saved seeds of old and obsolete varieties.<sup>19,20,21</sup> Farmers retain seed of major food crops (wheat, rice, sorghum, millet, corn, and pulses) and commercial crops for many years, and the largest volume of seed trade involves local exchanges of established self-pollinating varieties.<sup>7</sup> It is in this context that strengthening of informal seed supply systems have to be encouraged and incentivized. Farmers, farmers' organizations (FOs) and NGOs highlighted that the Seeds Bill is completely silent on these issues. The returns from Participatory Plant Breeding (PPB), compared to conventional breeding, are higher because it is cheaper and benefits to farmers are realised earlier.<sup>22</sup> A number of PPB varieties have been already released for many crops e.g., rice, maize, sorghum, barley etc.<sup>23</sup> There are several local farmer-producer companies, community based

organizations and seed banks, civil society organizations and local private firms that produce and supply seeds for use in diverse farming systems in India.<sup>7</sup>

Higher prices of seeds in case of hybrids and proprietary technologies like *Bt*. cotton seeds were also reported by majority of the farmers in Bihar and AP. Farmers in both the states agreed that they were ready to pay higher prices if the seed is pure and gives better yields. However, they added that they incur heavy losses if the seed is spurious. Since, farmers invest in cost of cultivation along with the costly seed, failure of seed puts a heavy financial burden on them. It is more so for small and marginal farmers who constitute 85% of the operational land holdings in India.<sup>24</sup> These farmers normally purchase seeds and other inputs on credit with higher interest rates from seed/ input dealers. The situation gets aggravated with the lack of strong mechanism for compensation in such cases. CSA reported that for farmers who depend on market-supplied seed, seed cost constitutes anywhere between 6% and 33% of cost of cultivation, depending on the crop.<sup>15</sup> Further, use of hybrids also necessitates farmers to purchase seeds every year. The component of royalty/ trait fee has also contributed for the higher price of seeds in case of proprietary hybrids including *Bt*. cotton seeds.

Farmers reported that seeds of *Bt*. cotton were sold in much higher prices than the MRP in Andhra Pradesh. Though seeds were available in plenty, the seeds supplied by few selected private seed companies (PSCs) were available in black markets at prices ranging from two to three times the MRP. In case of Bihar, farmers expressed that misbranding of seeds was a serious problem. Wheat seeds produced and supplied by Tarai Development Corporation (TDC) are popular among farmers (popularly known as Pantnagar seeds) because of high quality (genetic and physical purity) and better yields. But various unscrupulous agents were selling seeds using the brand name of TDC seeds. There was no mechanism for farmers to ensure if the seeds were original or the misbranded. On the other hand, the regulation by government on such unscrupulous agents was poor on account of severe shortage of manpower at every stage of seed production, certification, testing and inspection. Farmers reported that they experienced yield loss ranging from 30 to 60% by using such misbranded seeds. Closely related to this issue was compensation mechanism. Experiences of farmers incurring losses due to seed failure are accumulating over the years and needs

policy makers' attention. The seeds have either failed to germinate, give uniform growth or yielded significantly less than the expected yield. Even when crop failure could be clearly attributed to spurious seeds, farmers never received compensation. In some cases, PSCs replaced seeds to the farmers but by then farmer has incurred losses and the season was lost for re-sowing. Seed dealers in Bihar reported that even public seed organizations including State Department of Agriculture did not pay compensation to farmers in certain cases of seed failure. The PPVFRA, 2001 has provision for farmers to claim, *via* a PVP Authority, compensation from the breeder of a variety if it does not perform as expected.

The Seeds Bill states that farmers can claim compensation through consumer forums under the Consumer Protection Act 1986. But it is difficult for farmers in this country, who are mostly illiterate, to access and successfully obtain redressal through these consumer forums. There is a need for establishment of Compensation committee to decide on matters related to compensation to farmers in case of failure of seed to give expected yield. The committee should be a technically competent body and have representatives from SDA, central government, private seed companies, farmers and insurance companies. It is to be noted that at present there is a mechanism for crop insurance (for general crop production) in India but it is absent for seed crop. Hence, there is a need for initiating seed crop insurance scheme and farmers demanded that government should initiate the process of formulating guidelines and policy in this direction.

The Bill is completely inadequate when it comes to compensation to farmers in the case of seed failure. The bill should take the opportunity to provide a mechanism for providing compensation to farmers in case of seed failure. Such compensation should be linked to a seed insurance system the premium for which is paid by the seed trader. Compensation should also be calculated based on a formula that should be specified in the legislation itself. This should be the monetized value of the expected performance as well as coverage of costs of cultivation incurred and not just the seed cost. Expected performance should be taken as the promised performance specified on the leaflet in the given conditions.<sup>15</sup>

The farmers and other stakeholders have been demanding for granting more powers to state governments in regulation of seed trade in their respective jurisdictions. This issue gains more importance in the context wherein the state

governments are being sued in legal courts by MNCs for taking decisions in the best interests of the farming community. Many instances wherein state governments have failed to regulate the erring companies because of absence of appropriate and strong provisions in the seed legislations and consequent absence of powers to state governments have been reported. In a letter to the then Honorable Prime Minister, Government of India, representatives of farmer wings of different political parties, independent farmer organizations and NGOs working with farmers have quoted following four cases citing the helplessness of government of AP in regulating private seed companies in the state.<sup>25</sup>

- 1) In 2005, after establishment of large scale cotton seed failure in Warangal district, state government asked Mahyco to pay compensation. This company refused to pay and moved to AP high court on paying compensation saying state government is harassing them. AP High court orders were also in favour of Mahyco and till date the company has not paid the compensation.
- 2) In 2006, after Monopolistic and Restrictive Trade Practices (MRTP) Commission's ruling to reduce the *Bt* cotton seed price, AP government reduced the cotton seed prices to Rs. 650 and Rs. 750 for Bollgard I and II respectively. Challenging this, MMB moved to Delhi high court on this issue. The case is still pending in the court.
- 3) In 2007, when Agriculture Officers in Warangal district (in AP) found that Mahyco *Bt* hybrids were being sold in Warangal market, they raided and seized the shop. Mahyco challenged that cotton seed was removed from Essential Commodities Act (ECA) 1955, hence Seed Control Order which draws powers from ECA does not apply to cotton. At this juncture, AP government made a new act to regulate transgenic cotton seed in the state. However, all these Acts, including Seed Control Order 1983, will be repealed once the Seed Bill 2004 is passed, there by taking away the rights of the farmers and also the powers of the State government.
- 4) In 2010, Monsanto filed case in AP High Court requesting to stop state government from reducing the royalty arguing that it does not have any power to do so. The case is still pending in the court.

Honorable Chief Minister of Bihar, in his letter to the then Union Agriculture Minister, Government of India, stated that Bihar state exchequer faced an extra burden

of Rs. 61 crores as compensation to the farmers at the rate of Rs 10,000 per acre, because of non-formation of grain after maize farmers used hybrid seeds supplied by private companies in 61000 hectares in the rabi season of 2009-10. Yet, the private companies did not do anything to compensate to farmers.<sup>26</sup>

In the existing legal framework, state governments have no powers and they are finding it difficult to regulate the seed industry. Even in Seeds Bill 2004, powers to State governments are inadequate. Agriculture is a State subject under constitution of India and it is State governments who will be implementing the Seeds Bill (after enactment). Hence, State governments should be given powers to regulate seed prices and royalties, to evolve a simple mechanism to pay adequate compensation and to award punishment for offenses with adequate fine.

#### *Priorities of Non-Governmental Organizations (NGOs)*

Priorities of NGOs and their Garrett rankings are provided in Table 3. Even NGOs considered protecting and upholding farmers' rights, strengthening informal seed production and distribution system and strong compensation mechanism as the most important issues. In fact, it was at the insistence and pressure of many NGOs and farmers' organizations that various amendments related to farmers' rights were accepted by the government. NGOs argued that providing enough powers to state governments would address many issues such as pricing of seeds, regulation of seed trade in the respective states and speedy compensation to farmers.

Sl. No.	Issue	Mean score	Rank
1	Protecting and upholding farmers' rights	77.70	I
2	Strengthen informal seed supply systems	65.13	II
3	Powers to State governments	58.77	III
4	Seed sale price regulation mechanism	54.70	IV
5	Compensation issues	47.60	V
6	Stringent punitive and accountability clauses	47.23	VI
7	Availability of quality seed in sufficient quantities	47.00	VII
8	Government investment in infrastructure and public R&D	45.77	VIII
9	Check malpractices in the seed market	28.40	IX
10	Development of innovations (new varieties and hybrids)	26.70	X



NGO representatives also believed that various seed related problems farmers face these days such as spurious seed, higher prices, complete dependence on markets, etc. were the consequences of the decreasing role of the public sector in production and supply of quality seeds. This situation was further aggravated by the huge shortage of manpower and infrastructure in seed production, certification, testing and distribution in public sector organizations especially in State Departments of Agriculture, State Seed Corporations, State Seed Certifying Agencies and State Seed Testing Labs. Hence, it is strongly advocated for strengthening of public sector seed agencies by investing in infrastructure, man power and seed R&D.

NGOs opined that existing provisions in the Seeds Bill were not deterrent enough to prevent malpractices in supply of spurious seeds worth crores of rupees. Previous seed legislations have clauses to punish the seed industry for violating the provisions of the Seeds Bill. However, many argued that the fines are flat (fixed value irrespective of volume of spurious sale of seed) and even the punishment to deter in indulging in production and sale of spurious seed was weak. The penalty clauses provided in the Bill for offences are very mild and not deterrent enough. Given that spurious seed trade is worth crores of rupees, the small penalties being proposed are not any deterrent to the offenders. There should be a formula specified in the Bill itself for calculating the penalty applicable. For instance, the penalty should be based on the quantity of seed supplied or stocked with malicious/negligent intent and therefore, X-times (may be 5 to 10 times) the real loss or potential loss incurred by farmers and not a fixed amount irrespective of the magnitude of the offence. CSA reported that punitive and compensation clauses should apply to misbranding, selling at prices higher than specified prices/ MRP, failure of germination, lack of genetic purity etc. Misbranding should be defined to include failure to reveal or keep up promises made during marketing/ propaganda by the company and should include failure to reveal or keep up promises on expectable performance under different conditions as per the MLTs as part of the packaging of the seed.<sup>15</sup> Hence, it is recommended to make punitive measures more stringent and should take into account the nature and volume of seed transaction.

**Priorities of Agriculture Department Officials (ADOs):**

Priorities of ADOs and their Garrett rankings are provided in Table 4. ADOs expressed that shortage of

man power and infrastructural deficiencies have to be addressed so that State Departments of Agriculture can fulfill one of its important mandates of production, distribution and quality control of seeds. CSA reported that AP has the highest seed replacement rates among all the states for many crops, ranging from 40-50 per cent in rice (varieties and not hybrids) to 80-100 per cent in hybrid crops such as maize, sorghum, sunflower and cotton. This means that the requirement of high quantities of seed production is higher in AP and concomitant with it is the need for a certain kind of infrastructure, regulation of players and so on.<sup>15</sup>

Even ADOs felt that farmers' rights are to be protected at any cost. The responsibility of seed law enforcement is vested with the state governments.<sup>27</sup> Hence, ADOs also shared the view that State governments should be given enough powers to regulate seed industry in their respective jurisdiction.

Coordination among public and private seed producing agencies is necessary to address the problem of excess supply of seed in certain crops and huge shortage in some other crops. The main focus of private seed companies has been on the high value low volume seeds and market for low value high volume seeds of cereals, pulses and oilseeds is still dominated by the public sector seed corporations. ADOs endorsed the view of farmers and NGOs such as compensation linked to seed crop insurance, stringent punitive and accountability clauses, regulation of sale price of seeds and controlling malpractices in the sale of seed in the market.

Table 4—Priorities of State Agriculture Department Officials N = 30

Sl. No.	Issue	Mean score	Rank
1	Strengthening public sector seed agencies by addressing human resource and infrastructure shortages	74.03	I
2	Production, distribution and quality control of seeds	65.00	II
3	Protecting and upholding farmers' rights	64.33	III
4	Powers to State governments	61.53	IV
5	Seed sale price regulation mechanism	52.33	V
6	Compensation issues	44.13	VI
7	Stringent punitive and accountability clauses	38.10	VII
8	Seed crop insurance	35.57	VIII
9	Check malpractices in the seed market	33.97	IX
10	Coordinated planning in seed production by various public and private seed producing organizations	30.00	X

### *Priorities of Researchers*

Priorities of researchers and their Garrett rankings are provided in Table 5. It was interesting to note that even researchers from ICAR and SAUs considered protecting and upholding farmers' rights as central to the Indian seed legislation. Development of new cultivars with improved yield performance and tolerance to various biotic and abiotic stresses was the most important issue for researchers. Increasing Varietal Replacement Rate (VRR) was as important as Seed Replacement Rate (SRR) for researchers. However, the information on VRR for various crops in different parts of India is not available in the literature to gain meaningful insights.

Strengthening infrastructure and institutional mechanisms to boost seed R&D, seed multiplication and distribution system was the other most important issue for researchers. It was also strongly advocated for strengthening of the informal seed production and supply systems. They endorsed price regulation mechanism, granting enough powers to state governments and stringent punitive clauses as the other important issues to be addressed in the Seeds Bill. However, researchers expressed that price regulation should be considered case by case basis and should not be imposed for all the crops under all the circumstances. It was also added that adequate incentives have to be provided for PSCs to invest in seed R&D, infrastructure and market. Some researchers suggested that since PSCs are registered under Private Companies Act and have pan-Indian business operations, the powers to regulate prices should rest with a committee headed by central government and state governments being its members.

Researchers expressed that government's focus should be on harnessing the strengths of both public and private sector and ensuring that roles of both the players are supplementary and complementary to each other.

### *Priorities of Seed Dealers and Retailers*

Priorities of seed dealers and retailers and their Garrett rankings are provided in Table 6. The production and supply of sufficient quantity of quality seed will serve the interests of not only farmers but also that of seed dealers. The richer harvests reaped out of seeds bought from a dealer will make the farmer return to the same dealer in the next season. If the seed fails, the dealer will lose his credibility among the farmers even though he/she has nothing to do with the physical and genetic purity of seed and its performance.

Most seed is available to the farmers at a time that they need it, in adequate quantities too. However, timely availability is indeed an issue when it comes to crops like cotton, especially of brands which are in great demand, according to the farmers. For the companies and traders there is also a ploy of creating an artificial or increased demand by spreading rumours through their "agents" that a particular variety of seed is being preferred by many farmers and that unless advance bookings are made, the seed may not be available during the season. Further, after having created a demand, during the sowing season, many farmers are turned away by dealers saying that there is a shortage of supply. Assuming that the seed is indeed in great demand, farmers then are willing to buy the seed at greater prices in the black market.

Table 5—Priorities of Researchers involved in seed R&D N = 30

Sl. No.	Issue	Mean score	Rank
1	Protecting and upholding farmers' rights	74.03	I
2	Development of innovations (new varieties and hybrids)	62.33	II
3	Availability of quality seed in sufficient quantities	60.97	III
4	Strengthen informal seed supply systems	59.23	IV
5	Government investment in infrastructure to boost public seed R&D	42.03	V
6	Seed sale price regulation mechanism	34.90	VI
7	Compensation issues	32.07	VII
8	Check malpractices in the seed market	31.50	VIII
9	Powers to State governments	29.20	IX
10	Stringent punitive and accountability clauses	24.73	X

Table 6—Priorities of Seed dealers and retailers N = 30

S. No.	Issue	Mean score	Rank
1	Availability of quality seed in sufficient quantities	70.80	I
2	Government investment to strengthen seed market infrastructure (seed processing, storage, quality control, etc.)	63.47	II
3	Check malpractices in the seed market	55.57	III
4	Seed sale price regulation mechanism	54.93	IV
5	Compensation issues	51.63	V
6	Powers to State governments	50.70	VI
7	Stringent punitive and accountability measures	48.23	VII
8	Seed crop insurance	45.17	VIII
9	Protecting and upholding farmers' rights	32.43	IX
10	Coordinated planning in seed production by various public and private seed producing organizations	26.07	X

This was the case with *Bt* Cotton seed last year, where the seed instead of Rs. 1600/ packet, was sold at Rs. 2500/- in the black market.<sup>15</sup> Seed dealers strongly advocated for curbing malpractices in the market such as misbranding and black marketing of seeds. They said that those who indulge in such activities are normally not the registered dealers but some unauthorized groups who take the advantage of sudden spurt in demand of seed during onset of sowing season. Strict monitoring by the government was in the interest of registered dealers. Dealers suggested that improving seed market infrastructure including seed processing units, storage, quality control and inspection would address this issue.

Majority of the seed dealers were also of the view that seed price should be regulated in the interest of the farmers. It was agreed that compensation should be linked to insurance. It was also added that in case of seed failure, dealers should have a say in paying compensation to farmers since farmers generally approach dealers, from whom they purchase seeds, rather than the producer of the seed. Seed dealers also endorsed for strong punitive and accountability clauses, and coordinated planning and production of seeds.

#### *Priorities of Private Seed Companies (PSCs)*

Priorities of PSCs and their Garrett rankings are provided in Table 7. Since retail price regulation is already under practice in case of *Bt*. cotton seeds in India, PSCs were apprehensive that it would be extended to hybrids of other crops too. Hence, their main demand was for the deregulation of pricing of seeds and no intervention by central and state governments in determining seed prices. It was endorsed for further liberalization of Indian seed policy that allowed easier import and export of germplasm, seeds and technologies; incentives to PSCs to invest in seed R&D and infrastructure; self-certification and testing of seeds; and least regulation of seed markets by the government. Chand and Pal reported that about 50 per cent of the total investment in agricultural research in developed countries is contributed by private sector.<sup>28</sup>

PSCs expressed that seed germplasm available with them was very limited and called for public institutions like National Bureau of Plant Genetic Resources (NBPGR), ICAR institutes and SAUs to share their germplasm with them. This would help in development of superior cultivars from private sector. They also called for public-private partnership in

development and marketing of new cultivars. It was expressed that public sector has the advantage of resources in terms of rich and diverse germplasm, better research facilities and infrastructure. The strengths of public seed sector coupled with strengths of private seed sector such as efficiency in use of resources and market access would supplement and complement the efforts of the both. FAO reported that neither the private nor the public sector can fulfill India's agricultural requirements by itself. Only effective cooperation and coordination will allow farmers to have access to quality seeds and thus contribute to sustainable agriculture and food security.<sup>29</sup> The Seeds Bill 2004 also seeks to address the concerns of the Seed Industry. The Seed Association of India and the Association of Seed Industries raised certain demands at the National Seeds seminar organized by them in 2005. A level playing field for the private sector was demanded, for subsidies and support to the private sector for R&D (specifically to facilitate exports). Another major demand was that seeds be taken out from the purview of the Consumer Protection Act, 1986 and that a scientific system of scrutinizing claims, along with a system of crop insurance, should be developed to study the causes of crop failure.<sup>30</sup>

As of now, *Bt* cotton is the only transgenic crop approved for commercial cultivation in India. But there are many other transgenic crops in various stages of development by public and private organisations. The moratorium imposed on *Bt* brinjal

Table 7—Priorities of Private Seed Companies N = 30

S. No.	Issue	Mean score	Rank
1	Deregulation of sale price of seeds	76.27	I
2	Liberalization of seed policy	66.93	II
3	Development of innovations (new varieties and hybrids)	56.97	III
4	Access to germplasm available with public sector organizations	55.97	IV
5	Production and supply of quality seed in sufficient quantities	49.73	V
6	Self-certification of seed	47.70	VI
7	Public Private Partnership in development and marketing of innovations (new varieties and hybrids)	46.33	VII
8	Government investment in infrastructure to boost seed R&D	45.70	VIII
9	Single window mechanism to oversee the regulation of transgenic crops	29.33	IX
10	Strengthen quarantine system to augment export and import of superior germplasm and innovations (varieties and hybrids)	24.07	X

by the government in 2012 was considered as a greatest setback by PSCs. They expressed that approval of transgenic crops in India is lengthy and cumbersome involving approvals from various departments for biosafety and environmental clearance. They made a strong appeal to central government to establish a single-window mechanism to oversee the approval and release of transgenic crops. Linton and Torsekar (2011) reported that market access, intellectual property rights and regulatory review processes are the three factors identified by industry sources as important to innovation in biotech seeds.<sup>11</sup>

On one hand, there were reports of farmers' suicides owing to failure of crops, including *Bt* cotton, and on the other, stories of farmers who found the highway to prosperity through the use of the same *Bt* cotton. It is believed that this new technology has the potential to improve living standards, and as such, several powerful groups support the commercialization of such GM crops (especially *Bt* cotton), including the Indian Council of Agricultural Research, Ministry of Environment & Forests, Government of India and the Federation of Indian Chambers of Commerce and Industry (FICCI).<sup>31</sup>

PSCs also stated that quarantine facilities in India are outdated and have led to very slow and lengthy procedures to import seeds and technologies. Since, seed is a biological entity, delaying entry of imported seeds for weeks or months would adversely affect its longevity and performance. It was suggested for strengthening of quarantine facilities. Some of the PSC representatives even suggested the idea of establishing private sector owned quarantine facilities.

Under the Bill, the accredited individuals and institutions will be able to provide seed certification. The provision of self-certification is also allowed. The practice of production and sale of Truthfully Labeled Seeds is already in practice in the country. But, these seeds are not sold as "Certified seeds". However, Private Seed Companies are demanding government for allowing them to certify their own seeds to be sold as "Certified Seeds". At present, seed certification in India is done only by State Seed Certification Agencies which are autonomous bodies. NGOs insisted for this third party seed certification system to be continued since self-certification of seeds leads to conflict of interest. Farmers opined that option of TL seeds be continued but they should

not be sold as certified seeds. Hence, the provision of self-certification (as 'Certified Seeds') should be withdrawn and the current system of third party certification be continued with more accountability measures.

Hence, it is clear that farmers, NGOs, ADOs, researchers and even seed dealers were unanimous in their demand for protecting farmers' rights and strengthening informal seed supply systems. There was general agreement among farmers, NGOs, ADOs and researchers about strengthening the role of public sector seed agencies, pricing of seeds, trait fee regulation, compensation issues, stringent punitive and accountability clauses and granting enough powers to state governments. However, priorities of PSCs were completely different and were even contrary to the priorities of farmers and other stakeholders. The priorities of PSCs were aimed at liberalization of Indian seed policy, least intervention by government in seed market, access to rich germplasm available with public sector and deregulation of seed prices.

## II) Differences among Stakeholders on Contentious Issues Related to Seeds Bill

After understanding the priorities of each set of stakeholders, it is also important to determine the extent of agreement and disagreement among these stakeholders on these contentious issues.

Hence, statistical test was employed to test the following question and the resultant hypothesis:

Did the farmers differ from other sets of stakeholders in their perception of the various contentious issues in the Seeds Bill?

**Null Hypothesis:** The farmers did not differ from other sets of stakeholders in their perception of the contentious issues in the Seeds Bill.

**Alternative Hypothesis:** The farmers differed from other sets of stakeholders in their perception of the contentious issues in the Seeds Bill.

The data were subjected to Mann-Whitney U test, which compares two samples to answer this question. Here the sample of farmers was compared with each of the other five samples of stakeholders on their perceptions of importance given to each of the twelve contentious issues in the Seeds Bill. The Mann-Whitney U statistics for all the twelve contentious issues and for all sets of samples are presented in Table 8. Any statistic that is significant statistically at 0.05 or 0.01 level of probability tells that there is a significant difference between the two

Table 8—Comparison of farmers with other stakeholders on contentious issues through Mann-Whitney U Test (N=30 stakeholders each; 180 total)

No.	Contentious issues	<i>Mann-Whitney U Test Statistics between samples of farmers and other stakeholders</i>					No. of other stakeholders with whom farmers differ
		V <i>NGOs</i>	V <i>ADOs</i>	V <i>Researchers</i>	V <i>Seed Dealers</i>	V <i>PSCs</i>	
1.	Protecting and upholding farmers' rights	448.0	450.0	448.0	206.5**	97.5**	2
2.	Strengthening informal seed production and distribution system	447.0	335.5	240.0**	258.0*	147.0**	3
3.	Powers to State governments	373.5	392.0	151.5**	422.5	72.0**	2
4.	Seed sale price regulation mechanism	442.0	280.5**	179.0**	222.5**	23.5**	4
5.	Trait/royalty fee regulation	446.0	316.5*	216.0**	293.5*	187.0**	4
6.	Strengthening of the public sector seed system	412.0	249.0**	171.5**	158.5**	160.5**	4
7.	Compensation issues	428.5	422.0	273.5**	412.5	103.0**	2
8.	Stringent punitive and accountability clauses	403.5	425.0	290.0*	342.5	175.5**	2
9.	Self-certification of seed	240.5**	429.0	327.0	297.5*	217.0**	3
10.	Registration and parentage issues	394.0	270.5**	392.5	341.5	265.5*	2
11.	Access to germplasm available with public sector organisations	317.0	330.0	323.0	247.0*	235.0**	2
12.	Liberalization of Seed Policy	189.0	238.5*	313.5**	247.5*	331.5**	4
	Number of contentious issues that farmers differ with others	1	5	8	8	12	

Note: \* and \*\* Significant at 0.05 and 0.01 level of probability respectively.

samples for the particular contentious issue under consideration. The results of the degree of agreement and disagreement of various stakeholders with those of farmers are presented in the following section.

#### **Farmers v NGOs**

Among all the stakeholders, NGOs shared a great degree of similarity with farmers on the issues of seed policy. NGOs and farmers' organizations were the most vocal group to raise serious objections on the anti-farmer clauses in the Seeds Bill 2004. A very active role was taken in bringing various contentious issues in the Bill to the mainstream discussion among farmers, policy makers, academicians and media. Hence, farmers' issues

were also the priority issues for NGOs. The issues such as protecting and upholding farmers' rights, strengthening of informal seed sector, granting powers to state governments, price and royalty fee regulation were the priority issues for both the farmers and NGOs. On the issue of self-certification, NGOs and farmers differed significantly. Farmers' view was that a form of self-certification is already in practice in the form of truthfully labeled seeds. However, NGOs were very skeptical about misusing this practice of self-certification by PSCs and argued that only third party certification by State Seed Certification Agencies should be continued and self-certification by PSCs should not be allowed. NGOs want to uphold the sanctity

and authority of the State Seed Certification Agencies for certifying seeds produced by all types of seed producers including private companies.

***Farmers v Agriculture Department Officials (ADOs)***

The two samples of farmers and ADOs appear to be similar on seven contentious issues and differ on five issues in the Seeds Bill. ADOs share similar views with farmers on issues such as protecting farmers' rights, strengthening informal seed sector, granting powers to state governments, and compensation issues. However, ADOs perceived that strengthening of public sector seed system (R&D, development of new cultivars, quality seed production, multiplication, distribution and quality control) as more important issue than regulating seed prices and royalties. ADOs argued that issues of price and royalty regulation are the outcome of weakening of public sector seed systems (and consequent domination of seed market by private seed companies) and added that as long as the public sector has a dominant role in production and distribution of high quality seeds to farmers, the price and royalty regulation are not priority issues.

***Farmers v Researchers***

The farmers and researchers appear to be quite dissimilar on eight issues and similar only on four contentious issues in the Seeds Bill. On the issue of farmers' rights, researchers were in agreement with farmers. However, there was a great mismatch between the priorities of farmers and researchers on several issues. For researchers, strengthening of public seed sector was more important than strengthening of the informal seed sector and issues of price and royalty regulation. Majority of the researchers also considered liberalization of seed policy as the most important issue, whereas for farmers it was the least priority issue. Researchers believed that liberalization of seed policy is helpful in import of superior germplasm and development of new cultivars. It would augment investment in R&D by seed companies and developing a competitive market for seed industry. It was also added that liberalization should be seen as one of the component/strategy of strengthening Indian seed sector and it is not a panacea for all problems. It was opined that liberalization of Indian seed market along with strengthening public seed sector was the better option.

***Farmers v Seed Dealers***

The farmers and seed dealers appeared to be quite dissimilar on eight issues and similar only on four contentious issues. Interestingly, dealers were in synchrony with farmers on issues such as granting powers to state governments, compensation issues and stringent punitive and accountability clauses. However, issues such as protecting farmers' rights, price regulation mechanism, strengthening of informal and public seed sector were not as important priorities for dealers as much as they were for farmers. Seed dealers shared that they get higher percent of commission by selling private sector seeds to farmers when compared to public sector seeds. Hence, the priorities of dealers were in more agreement with PSCs than with the farmers.

***Farmers v Private Seed Companies***

On all the twelve issues, PSCs were in disagreement with farmers. PSCs considered issues such as deregulation of prices, liberalization of seed sector, access to germplasm available with public sector and self-certification of seeds as more important. The motives of PSCs were driven at promoting their business interests and increasing their share in seed market. Protecting and upholding farmers' rights were not a priority for PSCs. PSCs were also apprehensive about revealing the parentage of their seed materials for registration and certification purposes.

The results of differential perception of various stakeholders revealed that the farmers' perception of priorities and concerns differed greatly with those of PSCs and moderately differed with those of researchers and dealers. But with NGOs and ADOs, farmers have agreement on almost all the issues of seed policy.

Based on the study, it is evident that protecting and upholding farmers' right over seed is the implicit yet most important priority. The informal seed sector has to be strengthened and incentivized. Huge shortage of manpower and infrastructure in public seed sector especially State Departments of Agriculture to oversee production, distribution and quality control of seed needs to be addressed on priority basis. Government's focus on increasing Seed Replacement Rate without addressing these issues is meaningless. There is a need for simple and efficient compensation mechanism linked to crop insurance. Seed sale price and trait fee regulation are the most contentious issues in the Bill. Regulation of seed sale price in case of

crops having royalty component (hybrids and proprietary technologies such as *Bt* cotton) under monopoly or monopolistic seed market conditions is scientific and consistent with Competition and Antitrust laws in India and other countries.<sup>32</sup> State governments have to be granted powers to regulate seed industry in the best interest of farming community. Ministry of Agriculture and Farmers Welfare recently issued an order to provide an effective system for fixation of sale price for cotton seeds to ensure their availability to the farmers at fair, reasonable and affordable prices.<sup>33</sup> This order has been welcomed by all the stakeholders including majority of private seed companies but is challenged by Mahyco-Monsanto Biotech Limited in Delhi high court. Based on the recommendations of nine-member committee, Ministry of Agriculture and Farmers Welfare has notified on 9<sup>th</sup> March 2016 the Maximum Sale Price (MSP) of BG I and BG II version of *Bt* cotton hybrid seeds at Rs. 635 and Rs. 800 respectively for a packet of 450 grams for the financial year 2016-17. MSP was fixed after taking into consideration the seed value, licence fees including one-time and recurring royalty (trait value), trade margins and other taxes. As per the notification, MSP of BG I version *Bt* cotton seeds do not include any trait value whereas BG II version seeds include trait value of Rs. 49 per packet of 450 grams.

### Conclusion

Farmers' expectations from the new Seeds Bill were to protect and uphold their traditional rights over seeds. This priority was implicit for farmers irrespective of their awareness and knowledge on laws that protected and upheld these rights such as PPVFRA 2001. Farmers' dependence on formal seed market and consequently, the demand for availability of quality seeds at affordable prices has increased. Farmers demanded for strengthening and incentivizing informal seed production and distribution system since it contributes for upto 80 per cent of seed distributed in the country. Speedy and efficient compensation mechanism needs policy attention. The priorities of NGOs and Agriculture Department Officials (ADOs) were similar to those of farmers. However, ADOs believed that strengthening of public sector seed R&D, production, certification, testing, distribution and quality control regime was the most priority area. There is a great degree of agreement among farmers, NGOs, ADOs and researchers that state governments ought to be granted

enough powers to regulate seed trade and industry in their respective states including powers to regulate sale price of and trait fee over seeds, to pay compensation and to take strict punitive and accountability measures. Development of new cultivars and production and distribution of quality seed were the most important concerns raised by researchers from ICAR and SAUs. Seed dealers expressed that issues such as distribution of quality seeds in sufficient quantities, measures to strengthen market infrastructure and curbing market malpractices need utmost attention. Private Seed Companies' (PSCs) priorities were completely different and even conflicting with those of farmers and other stakeholders. Their concerns were deregulation of seed prices, liberalization of Indian seed sector including nil/least market intervention by government, access to germplasm available with public sector, PPP to market public-sector bred cultivars, self-certification of seed and single window mechanism to oversee the clearance of transgenic crops.

Mann-Whitney U test revealed that seed sale price regulation, trait fee regulation, strengthening of public sector seed system and liberalization of Indian seed policy were the most contentious issues. The difference in priorities of farmers and PSCs were statistically significant on all twelve contentious issues, whereas researchers and seed dealers differed on eight issues with farmers. ADOs differed with farmers on five issues, whereas, NGOs priorities were similar with those of farmers on eleven issues.

Violations to farmers' rights in Seeds Bill 2004 have been addressed through appropriate amendments by Indian parliament. Issues such as regulation of seed sale price and royalty fee, compensation mechanism, granting powers to state governments, strengthening public and informal seed systems are the common issues on which there is general agreement by all stakeholders except PSCs. These issues need to be addressed in the final draft of the Bill before it is enacted into Seeds Act.

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