

How Effective is *Sui Generis* Plant Variety Protection in India: Some Initial Feedback

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The Indian *sui generis* Plant Variety Protection (PVP) law has a blend of IPR-savvy and public-interest provisions. There is no provision for the sale of farm-saved seed as branded seed as well as the presence of genetic use restriction technology (GURT) or 'terminator technology' in the varieties to be registered. Developments related to PVP applications filed and recorded in the initial two-and-a-half to three years since the beginning of registration process in the country suggest that the legislation could not be effective, particularly for the protection and commercial use of extant varieties, including the premium farmers' varieties. Inadequacy may be seen, for example, in terms of inappropriate notification of genera and species eligible for PVP, low filing of applications even for the notified genera for various categories of extant varieties defined as per law, few grants of IPR titles, little opportunities created/availed for the exclusive commercial use of extant varieties to enhance their cultivation/diffusion in the areas where maximum realization of their productivity and returns were possible, etc. Logic and prospects of licensing/cross-licensing extant varieties including premium farmers' varieties to small and local seed companies in the short term are discussed.

Keywords: Plant variety protection, farmers' rights, *sui generis* PVP law, intellectual property rights, extant varieties, premium farmers' varieties, essentially derived varieties, PPV&FR

The Plant Varieties Registry of India established under the Protection of Plant Varieties and Farmers' Rights (PPV&FR) Act, 2001 started receiving applications from 21 May 2007 at its New Delhi office, nearly six months after the Government of India (GOI) notified genera of 12 food crops¹ as eligible for registration of their varieties under the Act.² This opened up a new era of protection of intellectual property rights (IPR) on the varietal products used in Indian agriculture. The resultant, possible new equations in commerce and trade of seed and planting material were sure to impact agricultural production, farmers' livelihoods, sustainable use prospects and equitable sharing of benefits. The course of Indian R&D on plant improvement and variety development was also expected to be affected. This paper analyses some initial developments and experience on the handling of extant varieties and the premium farmers' varieties for the grant of IPR titles, and the efforts stipulated for their licensing for commercial and sustainable uses.

Historical

India is signatory to both Convention on Biological Diversity (CBD) and the World Trade Agreements (under the World Trade Organization, WTO); and had joined the respective intergovernmental negotiations or framework conventions from the opening days. Though India did not participate in the opening session of the Convention of the Union for Protection of New Varieties of Plants (UPOV), 1961 as it was a regional (European) initiative; it nevertheless took note that this development will have international consequences. This paved way for the grant of IPR titles to the breeders of commercially novel, distinct, uniform and stable plant varieties having a unique denomination.³ The GOI constituted a Seed Review Team (SRT) in October, 1967, which favoured the adoption of a Plant Breeder's Right (PBR) system, particularly as a means of encouraging private research.⁴

This new turn of events timed within the era of green revolution went unnoticed for quite some time as subsequent developments were slow. The Seeds Act, 1966; the Seeds Rules, 1968, and the New Policy on Seed Development (NPSD) announced in 1988 did not make any provision related to Plant Variety

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Protection (PVP). However, some of the objectives of NPSD, 1988 had indirect bearing on seed import and innovations. This policy facilitated the Indian seed industry to become more active, competitive and customer oriented. It also aimed at making the best of the genetic material available the world over to Indian farmers, promoting an innovative and competitive seed industry, and introducing a good number of impressive hybrids in crops like maize, sunflower, sorghum, cotton and vegetables.⁵

Enactment of *Sui Generis* PVP Legislation

First draft of the legislation on PVP was prepared in Indian Council of Agricultural Research (ICAR) in 1993. The draft was revised several times based on wide dialogue involving the Ministry of Agriculture and different stakeholders. A PVP Bill was, however, first tabled in the Lower House of Parliament (*Lok Sabha*) on 14 December 1999. *Lok Sabha* assigned the Bill to a Joint Committee of the two Houses of Parliament (JPC) to recommend its suitability for enactment as a new, *sui generis* PVP law. The JPC organized a series of country-wide meetings at the central level and in different states from December 1999 to mid 2000, heard the public viewpoint, and observed more than a hundred petitions that either opposed the Bill or sought some improvements in the same. Recommendations of JPC along with a revised draft were tabled in *Lok Sabha* August 2000 (ref. 6).

Some of the significant points accepted/suggested by JPC could be inferred to include: (i) safeguard for the extant varieties in Indian agriculture that would assure (a) sustainability of production in the transition period till the new proprietary varieties gradually overtake the exclusive seed market vis-à-vis the cultivation scenario, and (b) continuity of the well-tested, well-adapted inheritance factors of these materials in the future breeding programmes of public and private sectors, (ii) curbing the possible entry of genetic use restriction technology (GURT) or the terminator technology through PVP route in India, (iii) strong protection of the conventional rights of Indian farmers in Indian agriculture, and extension of the same to the use of protected varieties; (iv) safeguarding Indian farmers from innocent infringements and unforeseen complications of the PVP law, and (v) ensuring compensation for underperformance of protected plant varieties to safeguard the farmers' interests and also as a measure

to discourage premature entry of seed and planting material of such protected varieties in the market without proper evaluation for their cultivation and use under Indian conditions. Consolidation of the Bill by incorporating the suggestions made by JPC produced the new version, Bill number 123-II of 1999, which had added *inter alia* an elaborate chapter on farmers' rights.

The JPC recommended in favour of grant of IPR on plant varieties in the country in conformity with the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement); and it also held public interest high by making recommendations that would provide safeguards for conventional agriculture as well as Indian farmers. On the other hand, the JPC recommendation that farm-saved seed should not be sold as branded seed under the new PVP law was IPR-compatible and pragmatic too. At that stage, Indian farmers were proposed to be recognized, under the new PVP law, as (i) conservers of crop diversity and genetic resources, (ii) breeders of extant-farmers' varieties as well as new varieties, as may be applicable, and (iii) cultivators and producers enjoying the conventional right to sow, re-sow, barter or sell the farm-saved seed.

In the enactment process, the PPV & FR Bill was passed by *Lok Sabha* on 9 August 2001 and the Upper House of Parliament (*Rajya Sabha*) on 28 August 2001. The next version of the Bill incorporating further amendment suggestions made by the Members of Parliament got the Presidential nod on 30 October 2001. Thus assented by the President of India, it became the new *sui generis* PVP law entitled, 'The Protection of Plant Varieties and Farmers' Rights Act, 2001' (PPV&FR Act).⁷

Institutional Arrangements and Administration of PPV&FR Act

The PPV&FR Authority was established with the appointment of its first Chairman on 11 November 2005 (ref. 8). The Act also came into effect on the same date for limited purposes i.e. in respect of Sections 2-13 (definitions, authority and registry) and 95-97 (making regulations and rules). The examination of PVP applications is done by temporary staff appointed on tenure basis since there is no provision for the appointment of PVP examiners on regular basis. The PPV&FR Authority has appointed a few expert committees for getting assistance on specific techno-regulatory matters, including the registration of extant varieties.

The Plant Variety Journal of India was launched on 20 February 2007. It has also been given the status of Official Gazette for the purposes of notifications concerning PVP in India. National Test Guidelines have been developed and notified by the PPV&FR Authority for all the notified genera of crops and many other field and horticultural crops including, cereals, millets, pulses, oilseeds, commercial crops and spices.^{2,9,10}

The national agricultural research system, mainly the ICAR and the state agricultural universities (SAUs), have contributed significant material support as well as techno-scientific backstopping for building the requisite institutional mechanism to administer the new PVP law in the country. This included, besides lending the office space and conference facilities for the PPV&FR Authority/Registry in New Delhi by ICAR for a while, the development of input for the national test guidelines for various crops¹¹; optimization of test procedures and providing the testing facilities in the representative locations for the examination of distinctiveness, uniformity and stability (DUS) criteria; digitalizing extant-notified varieties database using Indian Information System (IINDUS) software.^{12,13} The Indian Agricultural Research Institute (IARI) of ICAR has also been providing training to interested professionals for getting the recognition as 'Professionally Qualified Persons' (PQP) under the PPV&FR Act.¹⁴

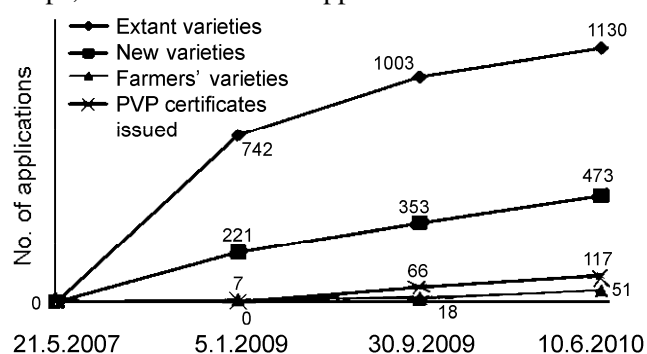
The National Gene Bank at the National Bureau of Plant Genetic Resources (NBPGR) has extended facilities and space in a separate, long-term seed-germplasm conservation module, thereby enabling the PVP Registry to store the referral seed samples of the plant varieties registered and protected under the PPV&FR Act.

Registration for Plant Variety Protection

The PPV&FR Registry started the process of receiving PVP applications for registration and protection of eligible varieties of notified genera of crops with effect from 21 May 2007 (ref. 2). Notifications issued by GOI, on listed genera of 12 and 2 crops, respectively, for the stated purpose. The first list covered genera of only food crops – 5 coarse cereals/millets (rice, bread wheat, maize, sorghum, pearl millet), and 7 pulse crops (chickpea, pigeon pea, green gram, black gram, lentil, field pea and kidney bean)¹ whereas the second list had two commercial crops – cotton (4 species) and jute (2 species).¹⁵

A total of 1,654 applications were received and recorded at the PV Registry as on 10 June 2010, which included 1,130 applications for extant varieties, 473 for new varieties and 51 for farmers' varieties. Fig. 1 shows corresponding number of applications received (as on 5 January and 30 September 2009), and also the number of titles granted.

Further, the crop-wise details of the 1,374 applications received and recorded at the PV Registry as on 30 September 2009 are given in Table 1. Overall, cotton has received the highest priority for PVP in the early phase in India. A total of 377 applications for cotton varieties were filed and recorded, which was followed by 248 applications filed for rice, 177 for maize, 128 for sorghum, 127 for pearl millet and 102 for wheat. Among the pulse crops, maximum PVP applications were received



Source: PPV&FR Authority, <http://www.plantauthority.gov.in>

Fig. 1- Status of applications for protection of plant varieties

Table 1— Status of applications for protection of plant varieties of various crops

Crop	New varieties	Extant varieties	Farmers' varieties	Total
Rice	53	187	8	248
Wheat	7	89	6	102
Maize	57	120	0	177
Sorghum	44	84	0	128
Bajra	32	95	0	127
Mung	4	29	0	33
Urd	2	20	0	22
Chana	8	46	2	56
Arhar	9	23	2	34
Masur	1	11	0	12
Matar	3	24	0	27
Rajmash	1	7	0	8
Cotton	128	249	0	377
Jute	4	19	0	23

Source: PPV&FR Authority, <http://www.plantauthority.gov.in>

for chickpea (56), followed by red gram (34), green gram (33), field pea (27), black gram (22), lentil (12) and kidney bean (8). For the registration of plant varieties of jute, which was notified along with cotton in the second list, only 23 applications were listed as on 30 September 2009.

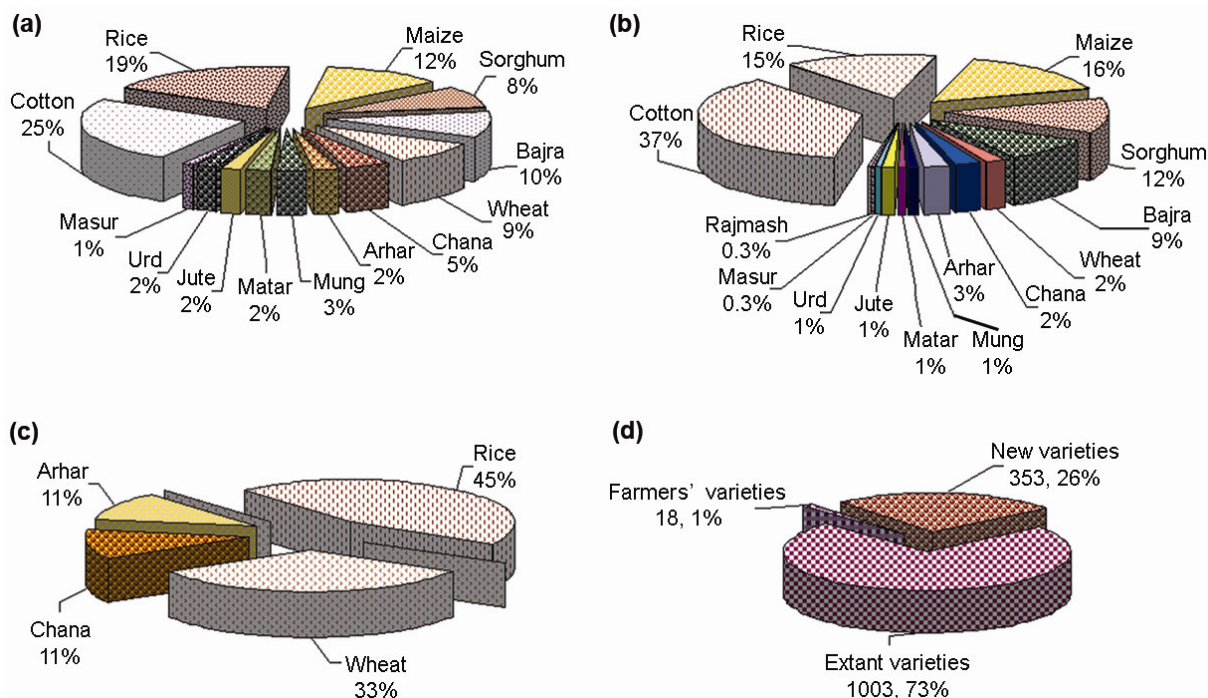
An edge by cotton varieties over the varieties of all other notified crops was seen in both new and extant variety categories, which is illustrated in Fig. 2. One-fourth of the applications of extant varieties of notified crops at the PV Registry belonged to cotton (Fig. 2(a)). This proportion was still higher for the new varieties (37%) (Fig. 2(b)). Maize followed cotton in respect of the new varieties (16%). However, in case of extant varieties, rice (19%) came next to cotton (25%). Other coarse cereals (wheat, sorghum) and pearl millet also attracted more applications for both extant and new varieties as compared to pulse crops. Overall, 73 per cent PVP applications were filed for extant varieties, 26 per cent for new varieties, and a meager 1 per cent for farmers' varieties (Fig. 2(d)).

Registration of Extant Notified Varieties

The expert- and public-opinion that had prevailed in the enactment of new, *sui generis* PVP law in India required making such safeguard provisions as would

help in first the sustenance and then the growth of national agricultural production under the new PVP regime. Thus, a simultaneous provision was made for the protection of extant varieties so as to make their best use in Indian agriculture. It was obvious that farmers would prefer to grow more of what they liked. The PPV&FR Act also safeguards the use of farm-saved seed. In addition, the prominent/premium extant varieties could also be perpetuated in the competitive market at the exclusive discretion of their breeders.^{13,16,17}

According to PPV&FR Rule 24, protection of extant varieties in the country would be completed in a fixed time limit of within 3 years of the gazette notification for the genera and species eligible for PVP. The notification of first set of 12 eligible genera of crops appeared on 1 November 2006 (ref. 1). Further, the Extant Varieties Registration Committee (EVRC) was constituted on 25 May 2007 in the third meeting of the PPV&FR Authority²; and the Authority issued a public notice⁹ under Rule 24 (1) of PPV&FR Rules, 2003 in March 2009 stating that the registration of extant varieties for the twelve crops, which were notified under the said notification, ends on 1 November, 2009. Since all interested applicants were required to have filed their extant variety applications well before the closing date, it is logical



Compiled based on data published by PPV&FR Authority, <http://www.plantauthority.gov.in> (30 September 2009)

Fig. 2— Status of applications made for the protection of (a) extant varieties, (b) new varieties, (c) farmers' varieties, and (d) overall status as per category

to assume that all the eligible extant varieties in the country for the notified food crops should have been protected by 31 October 2009.

The PPV&FR Registry issued only 66 certificates of registration of extant varieties until 30 September 2009, and 112 certificates up to 10 June 2010. By September, 2009, the EVRC had recommended registration/conditional registration of 156 extant varieties. Out of these, the recommendation for 68 extant varieties was that these may be registered on the condition that their denomination shall remain same as in Gazette Notification under Section 5 of the Seeds Act, 1966. (Table 2). The registrar PVP further held registration of a few extant varieties on different grounds, (i) the denomination is not the same as in the original notification (1 application), (ii) the variety has crossed 15 years from the date of its notification (1 application), (iii) the gazette notification details are not accompanying the PVP application (3 applications), and (iv) the authorization of breeder on Form PV-2 (authorization by the breeder) is not provided (2 applications). The EVRC also did not recommend registration of 8 extant varieties for which applications were filed.¹⁸ However, this may not have exhausted the scope for further pursuing these applications as per the relevant provisions of the PPV&FR Act, and, therefore, an appropriate procedural follow-up could still be made by the applicants.

In addition, 31 extant varieties that did not fall under the category of varieties notified under Section 5 of the Seeds Act, 1966, may have to be examined under the category of varieties of common knowledge. To this effect, the PPV&FR Regulations published on 29 June 2009 had further notified

Table —2 Some details of extant variety registration process as on 30 September 2009

Particulars	Number of varieties
Applications received	1003
Registration certificates issued	66
Recommended by Extant Variety Registration Committee (EVRC) for registration	88
Conditionally recommended by EVRC [®]	68
Not recommended for registration by EVRC	8
To be examined as extant varieties of common knowledge	31

Source: Compiled based on statistics published on-line by PPV&FR Authority, <http://www.plantauthority.gov.in> (10 October 2009).

[®] provided the denomination of the variety shall remain same as in Gazette Notification under Section 5 of the Seeds Act, 1966.

the criteria for determining distinctiveness, uniformity and stability of extant varieties of common knowledge as well as farmers' varieties.¹⁹

Registration of Extant Farmers' Varieties

The Indian law-makers had upheld the common law and equity precedents to maintain the already accepted conventional rights and privileges of farmers in the Indian society by making adequate provisions for the farmers' rights in the new, *sui generis* PVP law. For instance, a statue of this new PVP law admits farmers' varieties to the category of extant varieties, as proposed in the later versions of the PPV&FR Bill. However, initial post-implementation experience has indicated that the farmers in India had little overall interest in the IPR domain in plant varieties as is evident from a negligible number (18) of applications of only 4 crops filed for protection of farmers' varieties in the country in nearly two-and-a-half years till 30 September 2009. These include 8 (45%) in rice, 6 (33%) in wheat, and 2 (11%) each in chickpea and red gram (Fig.1(c)). Nevertheless, by 10 June 2010, the number has risen to 51.

Until 30 September 2009, only three farmers' varieties of rice, namely *Tilak Chandan*, *Hansraj* and *Indrasan* could reach the stage of field testing for qualifying the essential criteria for their registration whereas all other applications were at various other stages of examination but not a single farmers' variety was registered till that date. However, these three farmers' varieties have been registered subsequently.²⁰

Comparing National PVP Domains

It appears logical to draw a comparison between the national PVP domains of China and India, keeping in view some commonness of opportunities and challenges in agriculture sectors of these most populous developing economies. China has been the pioneer in hybrid rice technology whereas India also has to its credit first hybrids in many crops, including grain pearl millet, cotton, castor, etc.¹⁰ Both India and China have a high potential for the production and export of quality seeds and planting materials. Also, India has stood only next to China in the export of medicinal plants, wherein the country has exported plants worth US\$ 600 million a year, and more than 500 organizations were involved in the export of herbs.²¹ Thus, PVP can provide adequate opportunities to R&D, industry and exporters in both countries.

It broadly appears that the progress in receiving and processing of PVP applications in the initial phase of implementation of new PVP law is comparable in India and China. Compared to 1,374 PVP applications filed and recorded in India in nearly 2½ years, i.e. 549.6 applications per year, 2,351 applications were received in China in initial four years, which was at a slightly higher annual value of 587.8 applications. However, it is important to observe that the bulk of applications filed in India constituted that of the extant varieties (Table 1) whereas in China all PVP applications filed were those of the new varieties of (i) agricultural crops (2,046), which included 1,875 applications for varieties of field crops, 87 for vegetables, 52 for fruit trees and 32 for decorative plants, and (ii) forestry plants (305), including 253 for varieties of decorative arbors.

Another gap may also be seen in terms of number of species notified by the two governments. China, having established its PVP system in April 2000, had already notified²² by 2004, five lists of agricultural and four lists of forest plant species, covering 119 genera and species of 41 agricultural and 78 forest plants.²³

In contrast, India notified only two lists of 14 genera of crops in the initial phase. However, two more lists have been added since July 2009 to make up to a total of 28 crops and 34 species eligible for registration of plant varieties for their IPR protection (Table 3). Further, standardization of parameters for the notification of National Test Guidelines for some

oilseeds and horticultural crops is also ongoing in India^{2,8} which may pave way for the notification of new lists of eligible genera.

Implementation of some *Sui Generis* Provisions

There were gaps in the perception of various *sui generis* provisions stipulated prior to the enactment and their post-implementation status, which are discussed below:

Extant Notified Varieties

Opportunity Lost

A certificate of registration for a variety issued under the PPV&FR Act confers an exclusive right on the breeder or his successor, his agent or licensee, to produce, sell, market, distribute, import or export the variety, as per Section 28(1) of the PPV&FR Act. That would mean more freedom to the title-holders of extant varieties to decide on the course of flow of their varieties in the seed market. This could also mean more opportunity for small and local seed companies to in-license the extant varieties into their product portfolio and cater to the farmers' needs at the local level. However, this advantage of the exclusive ownership of extant variety is country-specific, and no IPR can be claimed and enjoyed in foreign jurisdictions on these already commercially-known varieties in India, being prior art in strict sense. Therefore, the implementation and enforcement of new, *sui generis* PVP law in India was crucial for availing the due advantage of this safeguard provision in the early period of the PVP regime.

Thus, a prime question is that whether there was enough preparedness in the country for facilitating licence-based transfer of registered extant varieties for their efficient delivery at the local levels? Or, to put it alternatively, whether there was any clarity of perception and understanding or not that a switch over from the routine indent-based, seed-chain linked delivery of public domain varieties in the past could be imminent and helpful? The facts observed indicate that there was not enough preparedness in the country to harness the right opportunity subsisting in the sustained use of at least the competitive and the premium extant varieties under the new PVP regime. Although, it has been already pointed out that many extant materials of food crops in the country, mainly bred in public sector, have shown highly satisfactory performance.²⁴ Many of the old Indian varieties still dominate the cultivation

Table 3- Genera/ species of crops notified for plant variety protection in India

Date of notification	Number of crops/ species	Crop groups/ crops
21 May 2007	12 crops/ 12 species	Cereals: Bread wheat, maize, pearl millet, rice, sorghum; Pulses: Black gram, chickpea, field pea, green gram, kidney bean, lentil, pigeon pea
31 December 2007	2 crops/ 6 species	Commercial crops: Cotton (4 species – tetraploid and diploid), jute (2 species)
27 July 2009	3 crops/ 3 species	Commercial crops: Sugarcane, turmeric, ginger
10 April 2010	11 crops/ 13 species	Spices: Black pepper, small cardamom, Oilseeds: Indian mustard (sarson), Karan Rai, rapeseed (toria), gobhi sarson, sunflower, safflower, castor, sesame, linseed, groundnut, soybean

Source: Compiled from the Gazette of India

fields or these have covered large areas over the decades. Many more are still in the seed chain. To substantiate this fact, the following case study made on the basis of the breeder seed demand of some landmark varieties released in the commercial production chain in India since the green revolution era (Table 3) is illustrated.

Case Study: Extant Wheat Varieties vis-à-vis Entitlements

The two wheat varieties in this case study (Table 4), C 306, bred in India, and Sonalika (highly complex pedigree, having at least three Indian landraces, Hard Red Calcutta, Etawah and Indian G, in its lineage), selected from material bred at the International Centre for Improvement of Wheat and Maize (CIMMYT), Mexico, were released in the beginning of the green revolution era. Yet both these varieties are in high demand even today. Their contemporary variety Kalyan Sona, which had reigned in the green revolution period, however, is not in demand any more because of its susceptibility to prevailing races of wheat rusts. Among the old varieties in highest demand in terms of their breeder seed requirement for 2010-11 are Lok-1, PBW-343, and Raj-3765. In comparison, demand for the new wheat varieties like GW-322 and DBW-17 is yet to pick up.

The wheat variety PBW-343 covered more than six million hectares of the Indo-Gangetic Plain, thus becoming one of the most successful varieties after Sonalika and Kalyan Sona of the green revolution period. Another variety, UP-262, developed at Pantnagar and released in mid-1970s is still popular in Eastern Gangetic Plains of Bihar State. This demonstrates success of conventional breeding products through deployment over space and time. On the other hand, landmark wheat varieties like HUW-234 and Raj-3765 are in demand due to their specific adaptability/resistance traits. It may be observed that Raj 3765 possesses a desirable combination of cellular thermotolerance.²⁵ This variety is highly suitable for late and very late sown conditions, resistant to rusts, and also has desirable quality parameters. Whereas HUW-234, released in 1986, is included in the list of landmark varieties despite relatively low yield (Table 4) because this somaclonal variant carries multiple genes for resistance to all the three rusts of wheat. This one-gene dwarf variety is excellent for late sown irrigated conditions, and it also performs very well in timely sown irrigated conditions, under general cultivation, zero tillage and surface seeding.

A large number of improved wheat genotypes were notified for their suitability in north eastern plains zone but the variety HUW 234 was still in great demand²⁶; and even after a decade of this observation made, a sizeable demand for breeder seed of HUW 234 is continued (Table 4).

The Indian wheat and rice varieties have also made remarkable contributions in enhancing the global food security prospects. A review has indicated that 50 varieties from Indian wheat improvement programme were introduced and released in 18 countries the world over.²⁷ Similarly, in rice, 53 entries of Indian origin in the international network for genetic evaluation of rice were named as varieties in different countries.²⁸ Other than the aforementioned scanty published information, a likelihood of Indian varieties/lines publicly available in other countries is still higher.

Thus, a realistic, sustainable use of the extant varieties could be through their appropriate commercial deployment over space and time.^{21,29,30} This may also promote their on-farm conservation in a few pockets, and thereby cryptic evolution of newer and better-fit alleles. Farmer participatory approaches to identify and adopt new variants could be relevant.³¹ Small seed companies may cater to the local needs of their business areas in a package, for example, contract seed production in suitable area(s), along with seed quality assurance of seeds of various kinds/crops and varieties through seed testing and labeling

Table 4— Current breeder seed demand (indents made to Union Ministry of Agriculture, Seed Division) of some landmark extant varieties of wheat for the seed chain

Variety	Year of release ¹ / Notification ²	Yield potential ¹ (q/ha)	Breeder seed demand ² (q)	
			2008-09	2010-11
Lok-1	1981/1982	45.4	2771.40	2677.23
PBW-343	1995/1996	63.0	1693.00	1936.80
GW-322	2002/2002	61.0	286.00	1159.48
Raj-3765	1995/1996	48.9	613.60	1093.60
DBW-17	2006/2007	64.1	54.80	948.00
HD-2189	1979/1980	45.7	528.00	585.44
WH-147	1977/1978	45.1	538.40	565.00
UP-2338	1990/1995	51.1	325.60	441.00
C-306	1965/1969	36.0	701.80	328.20
HD-2687	1999/1999	62.9	402.60	260.00
HD-2329	1985/1985	47.1	257.00	252.50
WH-542	1992/1992	61.5	152.60	157.00
UP-262	1977/1978	44.0	243.80	136.40
Sonalika	1967/1969	45.5	97.70	120.50
HUW-234	1984/1986	35.3	110.00	79.20
HD-2285	1985/1984	42.5	63.80	74.20

Source: ¹ICAR/Directorate of Wheat Research, Karnal; ²Seed Net India, <http://seednet.gov.in/....pdf>.

of their seed lots. On the other hand, a government intervention in each transaction of breeder seed could deny the opportunity to the small seed companies of legitimately adding the registered extant varieties to their own variety portfolio through licensing/cross-licensing. This may indirectly affect catering to the local production and delivery of extant varieties to meet the farmers' needs in remote and far-flung areas; where government-mediated supplies may not include even the prominent old varieties for situation-specific catering. Broadly, the Indian *sui generis* PVP regime intends to benefit the farmers (end-users) as much as the breeders (innovators); but a compulsory licensing like situation thus created at the administrative level can deny the title-holders, the licencees and the farmers, all alike, the intended benefits under the PVP law, which may also affect the agricultural production/ sustenance.

As per the notification¹⁹, the PPV&FR registry should have registered the extant varieties of notified genera/crops within three years of their notification. The ownership of most of the extant varieties of formal sector logically rests with ICAR and various SAUs, whether individually or jointly. It is well known that most of the extant varieties of food crops notified in the first phase have been individually or jointly developed by various ICAR institutes and SAUs; and identified for release by the ICAR's crop-based All India Coordinated Research Projects (AICRPs) through multi-location, multi-year testing of their value for cultivation and use (VCU). The ICAR has also funded research and breeding at the SAUs on a 75:25 basis from its share of government budgetary support.

Obviously, the grant of extant variety titles in the name(s) of ICAR and SAU, where applicable, would give them a reinforced technology handle for effective and efficient dissemination and diffusion of the relevant varieties for different agro-climatic zones, including through licensing to private seed sector. There may not be any further need to insist on indent-based breeder seed production of these extant varieties, which might have been de-notified/phased out as a matter of government policy.³² Rather, seed companies can effectively cater to the realistic requirements of farmers at the local levels through business in their enlarged portfolios of extant varieties acquired under licences from ICAR-SAUs; and public-private partnerships or consultancies for quality assurance, maintenance

breeding, etc; and also contract seed production of these varieties to incentivize some progressive local farmers.

Further, as prescribed in *proviso* under Section 28(1) of the PPV&FR Act, in cases where a breeder of an extant variety does not establish his right, the central government (for the varieties notified and released for the entire country or specific agro-climatic zones covering more than one state) or the respective state governments (in cases where such extant variety is notified under Section 5 of the Seed Act 1966 for a particular State) shall be deemed to be owner of such right. However, it was argued that the central and state governments themselves cannot go for registration of extant varieties that would not be traced back to a particular breeder.¹⁶ Nevertheless, applications for such varieties can also be filed as varieties of common knowledge, if needed.

A total of 89 applications for registration of extant varieties of wheat were recorded at the PVP registry as on 30 September 2009. The corresponding number of applications made in respect of all the 12 genera (crops) notified in the first lot is sizeable (735). The ICAR-SAUs and private seed companies must transact this win-win business through extant variety licences to serve their commercial interests as well as the interests of sustainable agriculture. The extant varieties owned by private sector can similarly be pooled/used through cross-licences. Further research and breeding can also be done in public-private consortia by entering into appropriate memoranda of understanding (MOU) and developing suitable work plans for collaborative R&D.

Further Opportunities from Extant Scenario

Thus, in the post-PPV&FR regime in the country, there is higher opportunity to explore and realize the maximum commercial spread of the successful varieties, which are still acceptable in different agricultural ecologies and situations. In several crops, such as plantation crops, the varieties are not covered under the Seeds Act, 1966 yet it will be important to safeguard their extant varieties for future use as commercial varieties and/or germplasm.² This could be possible by (i) securing their PVP titles under varieties of common knowledge, and (ii) executing licences/cross-licences of all extant varieties available in Indian agriculture, including the notified and de-notified varieties (varieties in public domain), and also the varieties of common knowledge and premium farmers' varieties. Such licensing contracts can also

help in invigorating the complementary strengths of public sector (in terms of meeting the breeder seed requirements and extending consultancy for monitoring the seed quality control) and private sector (in terms of more experience in contract seed production and marketing) in unison for the ultimate benefit of agricultural production and farmers' livelihood.

In addition, the private seed sector in the country also has the opportunity to strategize their international business in the matching agro-ecosystems world-wide by legitimately adding up the promising extant varieties through appropriate licences in their product portfolio. The enlarged range of varietal products at their disposal can also give them the advantage of firming up their market-networks and further gaining market goodwill of farmers and growers in their business area. The extant varieties also constitute the potential reserve for use as base materials for meeting the future, medium to long term R&D needs of variety improvement, particularly for the development of solution-specific essentially derived varieties (EDV) to combat specific problems that can be overcome by the genetic engineering/incorporation of single genes or gene-blocks/quantitative-trait loci (QTL) controlling the qualitative and quantitative traits, respectively.

Authentic statistics with regard to plant varieties is lacking. As per Section 8(2)(f) of the PPV&FR Act, it is the duty of the PPV&FR Authority to compile and publish statistics of plant varieties. Thus, PPV&FR Authority may consider fulfilling this basic prerequisite by extending funding and other support for organizing realistic surveys, and find out the availability and/or acceptance of particular varieties for specific areas in the country. Such funding support should not be merely for making petty reports but appropriate major project(s) should be supported, preferably in a consortium mode, which may aim at intensive, all inclusive surveys and analysis for bringing out authentic compendium/directory and on-line database in a short time span.

Extant Farmers' Varieties

An insignificant number of applications filed for the registration and protection of prevailing farmers' varieties for further commercial use is surprising particularly, when huge public opinion was built up before the enactment of PPV&FR Act to provide for extensive farmers' rights under the new *sui generis*

PVP law. At this stage, an important question is that whether it was necessary to bring the farmers' varieties at par with the commercial variety stream of the extant cultivars. If so, is there- (i) any formal or authentic list of extant farmers' varieties that could be used for exclusive marketing after registration under the PVP law, and (ii) any/sufficient country-specific data to compare the area, production, turnout, etc., of the farmers' varieties being referred to? And, if it is not, why there was haste in pushing the farmers' varieties issue ahead of the duly performing extant varieties and the well-organized, formal seed chain in the country? In fact, this uncalculated move itself could have complicated the interpretation of the extant scenario in Indian agriculture, which might have indirectly hampered the licensing and best use of suitable extant varieties in various agro-ecologies over space and time.

The fact of the traditional, sustenance agriculture that prevails all across the developing or the least-developed parts of the world is that the farmers have been growing their traditional varieties or landraces merely for harvesting something somehow for their own maintenance, unmindful of the levels of productivity, or prospects of their produce in markets or trade. Some of the extant farmers' varieties, no doubt, have been much superior in the traits of their liking, and these may also have the potential to be commercially used as diverse, ethnic goods in global markets. For example, two separate groups of farmers' varieties, including (i) two varieties of Navara rice, and (ii) ten varieties of Palakkad Matta rice, besides some other agricultural goods (varieties of guava, banana, spices, etc.) have already been registered under the Geographical Indications of Goods (Registration and Protection) Act, 1999.³³ There are several other ethnic materials among extant farmers' varieties similarly available in many parts of the country³⁴ (Table 4). However, attempts are yet to be made for filing their applications for registration and protection under the PPV&FR Act.

Reports have indicated that although the PPV&FR Bill provoked considerable public debate yet several would-be stakeholders were conspicuous by their absence.⁶ Among the notable absentees, according to author, were farmers themselves, as well as their organizations and unions, besides small Indian seed companies. The present studies also indicate the prevalence of similar situation in the post-implementation stage of the *sui generis*

PVP law. Lack of farmers' own interest or confidence in the new law has been substantiated with a negligible number of applications for the registration of farmers' varieties filed so far. It is obvious that on the expiry of the grace period for the registration of extant varieties of food crops, where maximum variability is expected in farmers' varieties, only the new farmers' varieties would be left eligible for their PVP.

The Act mandates the PPV&FR Authority to protect the rights of the farmers by such measures as it thinks fit (Section 8 (1)). In this context, it may be relevant for the Authority to identify and analyse the underlying factors due to which farmers were not attracted towards their rights under the *sui generis* PVP law. As of now, there is no study to indicate as to whether this was due to lack of interest by farmers in general, or because of inadequate facilitation or appropriate support to farmers by concerned agencies, including the state government departments, private seed sector, other non-governmental organizations that have been closely associated with farmers for several socio-economic activities, etc. There is hardly any colloquial literature available in market or any advertisement on television or print media or a scheme announced by PPV&FR Authority or state governments, which may encourage or help farmers to file PVP applications for their extant premium varieties on a priority.

To accommodate more applications of farmers' varieties for registration, the PPV&FR Authority may be considering extension of the period for their registration up to five year from the date of notification of the respective genera. However, there are no indications that the Authority has gathered any significant data on extant farmers' varieties to support any basis for extending the time limit for their registration beyond three years. Rather, maximum publicity should have been given to motivate the registration of the 'premium extant farmers' varieties' available in the country. It would be pertinent that various non-profit organizations or small seed companies in addition to the state machinery, agricultural universities, and farm science centres (*Krishi Vigyan Kendras*), with financial support through PPV&FR Authority under a specific project, assist the farmers in identification, documentation and filing of applications of their ethnic materials/premium varieties of food crops in a stipulated, extended time span.

Furthermore, a discovery of individual or group of extant premium farmer' varieties of commercial potential is not sufficient on its own for enterprising purposes. Rather, this would require intensive scaling-up and other business planning and development efforts after their registration and IPR protection. For example, it would include seed production, determining and labeling of seed quality parameters and variety performance limits, maintenance breeding, business incubation, etc., before moving into market for commercial purposes. Capital investment and other material resources will also be needed as an important pre-requisite. Thus, PPV&FR Authority may need to consider developing suitable scheme(s) aimed at the promotion of farmers' rights as may be facilitated through assistance for enterprising upon the registered farmer' varieties.

Use of Farm Saved Seed

With the release of transgenic BNBt variety, the cotton farmers for the first time, have the choice of retaining the farm saved seed of transgenic Bt cotton for its use in planting the next crop. The public research system in India has developed a pest resistant transgenic Bt cotton in the background of a popular extant variety *Bikaneri Lerma*.¹⁰ All other Bt cotton, so far, were developed and commercialized only as hybrids. As seed harvested from a hybrid is not suitable for directly raising its next crop, the realization of farmers' right as stipulated in the PPV&FR Act, could not be achieved under these circumstances.

Conclusion

One of the key questions that is still pondered over is as to why should the Indian seed industry get licenses of the registered extant varieties when the seeds are already available from public domain? It is an awareness-linked question, and to respond to it may require an understanding of the basic strengths of PVP/IPR law. Thus, a legitimate acquisition of varieties could raise the asset value of the seed company, giving strength to its overall business. Secondly, many of the extant varieties figure as reference varieties in the National Test Guidelines, and many others may be disclosed as most similar varieties in the PVP applications. Their availability in the variety profile of company's own assets can reduce costs of PVP, including the determination of Distinctiveness,

Uniformity and Stability (DUS) parameters of their new varieties, before filing of the applications for registration as well as during the examination phase.

Furthermore, as transgenics are likely to compete as routine new varieties/EDVs in the market, a legitimate availability of these genetic resources in the form of well adapted extant varieties as initial varieties would help the seed company in making cost-effective product development. Also, the legitimate ownership of proven extant varieties could further help a seed company in developing its international business relationships. On the other hand, mere acquisition of extant materials from public domain may lead to underestimation of their worth in transactions, both as assets and as business products.

The PPV&FR Authority/Registry have not come forward with any solution to address the PVP issue concerning the varieties of those species or crops, which have not been notified by the Central Government so far. In this context, the precedence set under the Patents (Amendment) Act, 1999 (ref. 35) could be relevant. It may be understood that the main difficulty before the PVP registry is the lack of adequate institutional capacity, including the absence of national test guidelines for all species/crops, due to which there may be difficulty in processing their extant variety applications at this time. Nevertheless, the provision of extant variety protection cannot be indefinitely extended and, sooner or later, some legitimate solution has to be found out. Moreover, any delay in the grant of titles to the breeders of eligible extant varieties of non-notified crops could cause anxiety to both owners as well as potential licensees who may wish to speedily build their valid extant variety portfolios through the licenses/cross-licences.

A possible solution is that like the patent amendment provision made in 1999, a provision for receiving and recording PVP applications in the Mail Box should be made under the PPV&FR Act. Under this provision/notification, applications for all eligible extant varieties, irrespective of whether their genera/crops have been notified or not, should be received by the PVP registry for a deferred examination. At the same time, exclusive marketing rights may be granted to the applicants whose varieties would be pending in the mail box so that commercial transactions on all extant varieties could be made without further delay. Nevertheless, the

PPV&FR Authority, after appropriate legal consultation, may also explore the possibility of notifying a suitable re-interpretation of the instant extant variety clause, if this may help in receiving all extant variety applications at an early date even without the suggested amendment/notification.

Handling of transactions on IPR-protected plant varieties is a techno-legal matter, which also needs authenticity of information. Therefore, publication of authentic, searchable details of varieties registered by the PVP&FR Authority, as being followed by the Controllers of Patents, Trademarks and Designs for the Indian patents and patent applications³⁵, could help in the much needed stepping-up of formal and effective transfer of the registered extant and new varieties through licensing to public seed agencies and private seed companies. On the other hand, mere prosecution for registration and grant and maintenance of titles would hardly carry any weightage other than meeting academic or publicity gains. The present seed-chain system of seed production and supply/sales controlled by Union Ministry of Agriculture has got already outdated and fatigued, which needs to be pragmatically improved. Licensing of registered extant varieties, including the notified-released varieties, premium farmer' varieties and the varieties of common knowledge, assures compatibility of approach with the rudimentary IPR management principles. There could be more enthusiasm in seed agencies/companies having larger and legitimate plant variety portfolios available with them, which they may build through licences/cross-licences of extant varieties to begin with. Such seed agencies/companies may tend to out-compete each other to ultimately ensure efficient local delivery of seeds to farmers, on one hand, and, on the other hand, to explore best possibilities of international partnerships, acquisitions or mergers towards the global use of their variety portfolios.

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