



India's protection of plant varieties and farmer's right Act 2001: Historical and implementation perspectives

KM Manoj Kumar

B. Com, ML, (Property Law), Advocate, Madurai Bar Association, Madurai District Court, Madurai, Tamil Nadu, India

Abstract

This paper examines the objectives and functioning of the PPV&FR Act in the light of the history and current state of Indian agriculture and available plant variety registration statistics. The analysis first studies the problems faced by Indian agriculture that the government seeks to resolve with the help of the PPV&FR Act. The paper highlights certain contradictions in the government's policies under the PPV&FR Act on the one hand and those aiming to increase India's agricultural productivity on the other. It also underscores the need and provides suggestions to make the Indian law more effective from a national interest perspective and to strengthen India's stand before the international community where article 27.3(b) of the TRIPs Agreement continues to be under review.

Keywords: PPV&FR Act, *sui generis* system, TRIPs

Introduction

Despite India's adoption of a *sui generis* system for the protection of plant varieties ten years ago, academic and sponsored reviews of the functioning of the Indian Protection of Plant Varieties and Farmers Rights Act, 2001 ("PPV&FR Act") are scant. Although a few analytical reviews are notable, a comprehensive statistical review of the Indian plant variety registration regime has so far not been undertaken. This article traces the evolution of Indian agriculture since Indian independence in 1947, till the enactment of the PPV&FR Act, highlighting the specific objectives that the Act sought to accomplish.

The PPV&FR Act: Background and Objectives from a Historical Perspective

The Indian Patents Act, 1970 (as amended in 1999, 2002 and 2005) excludes "plants and animals in whole or any part thereof other than microorganisms but including seeds, varieties and species and essentially biological processes for production or propagation of plants and animals" from patentability. Given the express exclusion of plant varieties from the scope of patentable subject matter, India was obliged to protect these under a *sui generis* system as per the mandates of Article 27.3(b) of TRIPs. In furtherance of its obligations under Article 27.3(b), India enacted the Protection of Plant Varieties and Farmers' Rights Act in 2001 ('the PPV&FR Act' or 'the Act').

However, environmental and public interest concerns (including the fear of monopolies in the field of life sustaining essential food) ensured that the Indian law did not just blindly copy the model laws under the International Convention for the Protection of New Varieties of Plants (UPOV 1978 and UPOV 1991). In fact, similar concerns affected the enactment of plant variety protection laws also in developed countries such as the United States: A look at the history of the US Plant Patents Act, 1930 reveals the caution with which legislators in the US adopted the system of proprietary rights in relation to sexually propagated crops and tuber-propagated crops. The Plant Patents Act, 1930

was limited to asexually reproduced varieties and excluded tuber propagated plants such as potatoes, and it was only in 1970 that the US introduced the Plant Variety Protection Act (Act 7 U.S.C. §§ 2321-2582) to provide protection to sexually reproduced plants.

Evidencing similar caution, discussions that had commenced more than a decade ago in early 1990 towards the introduction of a plant variety and farmers' rights protection regime in India, while gaining momentum after India's ratification of the TRIPs Agreement in 1995, culminated in the enactment of the PPV&FR Act only in 2001. Further, the law, as enacted, is clearly a sincere attempt to balance several, often seemingly contradictory, interests. The objectives the Act purports to accomplish are stated in its preamble: (i) To recognize and protect the rights of farmers in respect of their contribution towards conserving, improving and making available plant genetic resources for the development of new plant varieties; (ii) To protect plant breeders rights to accelerate agricultural development in the country; (iii) To incentivise both the public and private sector to invest in R&D for the development of new plant varieties (especially those suited to Indian climatic and other conditions); (iv) Facilitate the growth of the seed industry in India to ensure the availability of high quality seed and planting material to farmers; (v) To give effect to sub-paragraph (b) Article 27(3) of the TRIPs Agreement. After giving an overview of the history and existing state of Indian Agriculture, the article studies the stated objectives of the Act under two broad heads: (i) Protecting farmers rights and conserving landraces; and (ii) protecting plant breeders rights to promote private sector participation and development; and reveals areas of contradiction between these two objectives of the Act.

The Evolution of Indian Agriculture and the need for Further Development

While India today is self sufficient in most of its food requirements, it suffered from major famines and severe

shortage of food even until the mid 1960s. As a result of the Green Revolution, (coupled, to a smaller extent with increase in cropped and irrigated areas) India reached its current state of agricultural self-sufficiency. At the time the PPV&FR Act was passed, Indian agricultural produce was sufficient to feed the entire population of India, while also contributing 15 to 20% of the total value of India's exports. India was (and is) also an active participant and contributor to international agricultural R&D efforts, including international research efforts in wheat, maize and rice. Once the dissemination of HYV seeds to Indian farmers commenced, the Green Revolution spread rapidly to most farming communities because of the traditional practice of saving, resowing and exchanging seeds, *and* because of the absence of IP laws preventing these practices. Experts opine that in the absence of this tradition, such a rapid spread would not be possible.

The question therefore is why, despite the encouraging increase in food productivity through improved HYV seeds created and disseminated without underlying IP protection, India considered it necessary to introduce a plant variety protection regime to promote agricultural development. The objectives underlying of the introduction of the PPV&FR Act can be partly understood from the mandates of the TRIPs agreement, which India was obliged to meet, and partly from India's New Agricultural Policy, 2000 (NAP). The NAP aims, primarily, to increase physical and economic access to food by the masses, increasing food security and nutrition. It seeks to achieve this goal by increasing yield/produce on the one hand and developing new varieties with higher nutritional value on the other. The NAP further aims at providing adequate incentives for farmers to continue to pursue agriculture. In addition to these basic objectives, the NAP highlights India's commitment to (i) ensuring agricultural growth that is technologically, environmentally and economically sustainable, (ii) conservation of bio-resources including seeds, and (iii) giving greater importance (thrust) to development of (*inter alia*) rainfed and irrigated horticulture (an area that has thus far been largely neglected floriculture, roots and tubers, plantation crops and aromatic and medicinal plants. In order to achieve each of these objectives, the policy recognizes the need to encourage both public funded R&D, and also proprietary research in the field of agriculture, giving special emphasis to "frontier sciences" like biotechnology. India's agricultural policy therefore links up with the Indian PPV&FR Act, which was enacted with the express aim of incentivising private and public sector investment for the development of new plant varieties and also encouraging farmland innovation and conservation of traditional seeds.

key reasons: why India needs to ensure further agricultural development and why proprietary rights in the form of PVP laws are considered necessary:

- a. The population of the country continues to grow rapidly;
- b. The cultivable land area is shrinking, not only are the land resources of country finite, overuse of chemical fertilizers and pesticides is converting erstwhile agricultural land into infertile drylands;
- c. India continues to suffer a significant seed-gap in several of the important/staple food crops;
- d. The resources that the public sector can spare for agricultural R&D are limited – funding from the private

sector is necessary for continuing robust R&D activity in the agricultural sector and the private sector needs incentives including those in the form of intellectual property rights to invest in agricultural R&D;

- e. In the broad area of agricultural research, the 'international cooperation' model is being replaced by 'private proprietary' models as biotechnology plays an increasingly important role in the development of new plant varieties.

From the above, it is clear that India needs to encourage private participation for the development of Indian agricultural by (i) promoting the development of the private sector seed industry and (ii) encouraging private participation in agricultural R&D. At the same time, given the importance of promoting and developing local/traditional varieties, encouraging farmers' innovation is equally important.

Protecting Farmers Rights and Conserving Landraces

Traditionally, farmers across the globe have preserved plant genetic diversity while also enriching this diversity by human selection. As a result, there exist numerous landraces, conserved *in situ*, that show high adaptability to local conditions and other desirable characteristics such as drought resistance, pest resistance and medicinal properties. Recognising the importance of preserving genetic diversity, particularly in the light of the erosion of this diversity resulting from 'scientific' methods of commercial breeding and from the requirement of uniformity, stability and distinctness under the plant breeders rights regime introduced by UPOV, discussions had commenced at the international level under the aegis of the United Nations with the establishment of the International Commission on Plant Genetic Resources in 1983.

In response to international developments, India also commenced its efforts to establish a farmers rights regime to recognize and protect the "rights arising from the past, present and future contributions of farmers in conserving, improving and making available plant genetic resources" in the early 1990s. However, having reviewed the existing systems of intellectual property protection in relation to plant varieties (namely patent protection and the plant breeder's rights system under UPOV 1978 and 1991), a different form of protection was considered necessary in India in addition to, or instead of, the existing international models. The reasons for this included the following: Agriculture provides employment and the key means of livelihood to 65% of India's population. It also constitutes 24.5 per cent of the country's Gross Domestic Product (GDP). Most significantly, more than 67% of the total farming population in India constitutes small and marginal farmers. It was in this background that the Farmers' Rights regime (in addition to and distinct from the farmers' privilege regime under the UPOV system) was introduced under the PPV&FR Act.

The newly adopted 'Farmers' Rights' regime together with 'Farmers' Privilege' as per the UPOV 1978 model (rather than UPOV 1991) ensured a broad leeway to farmers to save, exchange and re-sow seeds saved from the harvest of a season, in the next season. Permitting farmers to save and re-sow seeds, rather than mandating the re-purchase of seeds from the market in each season is very important in the Indian context: the large percentage of farmers who are

small, marginal or subsistence farmers cannot afford to buy proprietary seeds from the market each season. Further, the public and the private seed sector together currently do not fulfill the seed requirement of the Indian farmers. In the course of saving seeds, farmers have also traditionally engaged in selective re-sowing of seeds derived from that part of the harvest that has desirable traits such as pest resistance, large size etc. Such traditional practices have also resulted in preservation of unique varieties of commonly consumed cereals, such as the award winning medicinal rice, Navara, from Kerala.

Protecting Plant Breeders' Rights to Promote Private Sector Participation and Development

The Indian Seed Industry and its Growth

Despite the absence of formal intellectual property protection, India witnessed robust growth of its private sector seed industry from the 1980s when it changed its policies, not only permitting, but also luring the entry of the private sector through various incentive mechanisms, particularly by opening up the seed sector for private competition. Therefore, although the Indian seed industry is relatively young (less than 50 yrs old in total, and only about 20 years old from the perspective of most private corporations), it is economically successful and technologically quite sound. This technological base is not only the result of purely private efforts; a significant amount of technological support has been given to the Indian private sector seed industry by public sector research institutions. Indeed, while technology transfer from the public to the private sector has lagged in most sectors in India, agriculture is perhaps one sector where considerable amount of technology transfer has taken place, once again, without any underlying intellectual property protection.

As of 2003, India had over 150 private seed companies (national and multinational) along with 13 State Seed Corporations. In recent years, the share of MNCs in the Indian seed market has been increasing steadily. There have also been several mergers or acquisitions of local seed companies by MNCs. Recently for example, Dupont, (one of the world's top five seed companies) acquired Nandi Seeds and the cotton germplasm business of Nagarjuna Seeds. The Rs 40-crore acquisition took place through DuPont India's subsidiary Pioneer Seeds. One would expect the lack of adequate or optimum intellectual property protection to contraindicate the increasing interest of the MNCs in the Indian market. This appears not to be the case in the Indian market.

In fact, despite the absence of any intellectual property protection until 2007, high quality seeds giving very high yield (often the highest recorded yield in the world) have been available in the Indian market for several years. However, a significant amount of agricultural R&D in MNCs now involves advanced biotechnology, the results of which are protected by patents in most developed countries, large corporations are increasingly demanding similar protection for the results of their R&D in India as well.

While it is clear therefore that Indian agriculture was flourishing without intellectual property protection for several decades, the PPV&FR Act and similar legislation throughout the world was and is being introduced on the basis of the international understanding that the private sector will likely not be enthused to meet the growing demands and increasing challenges of modern agriculture

without a suitable incentive mechanism.

However, legislations aimed at providing incentive mechanisms to the private sector must also encourage diverse R&D efforts, particularly in relation to crops and varieties that are most important for India's food security and nutritional needs. The current research interests of the public and the private sector, and whether the necessary or optimum incentive for the private sector to broaden their spectrum of R&D activity is being provided by the PPV&FR Act, has been studied later herein below with the help of filing trends under the Act.

R&D in the Seed Industry of India: Public V. Private

The Indian agricultural research sector, consisting of the Indian Council of Agricultural Research (ICAR), its network of institutes and a network of State Agricultural Universities (SAUs), conducts more than 75% of the agricultural research in India. Of this, the ICAR conducts about 43% of the research, the SAUs about 33%, the private sector about 16%, and international centers about 8%.¹ In addition to directly transferring know how generated from its research to farmers, the public research sector in India has also been the key source of inbred lines for the private sector seed industry. In fact, experts opine that the success of private sector research in the agricultural sector is a direct result of the strong research base in the public sector. However, in order to support and encourage agriculture, the government provides both agricultural input subsidies as well as agricultural output price support to its farmers. As a result of this subsidy driven farming (that incurs an expenditure amounting to 2.13% of India's total GDP and 8.8% of its agricultural GDP), the amount of government funds available for agricultural R&D is limited, thereby increasing the need to incentivise private participation in agricultural R&D.

The reasons for the private sector's research focus on hybrids, are perhaps obvious: Hybrids provide inherent trade secret type protection against competitors because their parental lines are not required to be disclosed and are difficult to identify by any process similar to reverse engineering in pharmaceuticals. Hybrids also provide inherent protection against widespread seed saving and resowing by farmers because of their biological incapacity to reproduce true to type. Under the umbrella of this natural/biological protection, the contribution of the private sector, particularly in relation to sexually propagated cereal crops (and also some cash crops) has been significant and has been growing rapidly. According to estimates for example, "the share of research hybrids on total turnover of crops like pearl millet, sorghum-sudan grass, sunflower, maize, sorghum and cotton was about 70% in 1997-98 compared to 46% in 1990-91.

The government therefore needs to take specific steps if it wants to encourage the private seed sector to diversify its research and commercialization interests towards crops for which hybridization technology is not currently available. This need is starker when one looks at the large seed gaps and low yield in relation to several important crop groups in India. Under the present PPV&FR Act, however, it has been predicted that in the private sector, the practice of producing low volume and hybrid seeds (that have a necessary 100% seed replacement rate) will probably continue. A look at the trends in plant variety application filings (q.v.) appears to largely confirm this prediction.

Closely connected to the issue of private participation in agricultural R&D and seed production, are the issues of 'seed-gap,' and the related issue of seed-replacement. The government's objective of reducing the seed gap and promoting seed replacement appears to directly contradict several policy decisions of the government under the PPV&FR Act

Conclusion and implementation perspectives

Private Sector: The private sector does not appear to be shifting its focus away from hybrids towards R&D in typical varieties of self and open-pollinating staple crops such as rice, wheat and lentils. India therefore needs to re-assess whether, through the current regime, it will indeed be able to meet its policy objective of encouraging the growth of the private sector seed industry, particularly the diversification of R&D efforts therein into 'typical' crop varieties, several of which constitute India's staple food. Such an assessment may also be necessary to justify India's stand in the ongoing review of Article 27.3(b) of TRIPs. It is however relevant that the private sector considers the act as providing an adequate means of preventing the copying of hybrid varieties including parental lines by competitors, suggesting that the Act does provide a significant degree of incentive to the private sector to continue and perhaps expand its research in hybrids.

In the context of the objectives of (i) encouraging the diversification of research interest of the private sector and (ii) increasing the quality (yield) of seeds available to farmers so as to maintain the necessary high agricultural productivity, it is also relevant to note that there appears to be a clear contradiction in the government's policy to promote seed replacement on the one hand, and the PPV&FR Act's policy of permitting saving and resowing of all types of seeds, including hybrid seeds, on the other. Since seed replacement, particularly of hybrid seeds is necessary to ensure good crop yield, the government may want to strengthen its efforts to educate the farmers about the importance of replacement of hybrid seeds each season. Following large scale initiatives to educate farmers about the importance of replacing hybrid seeds, it may also be beneficial to make appropriate changes in the law and ban the re-sowing of hybrid seeds. The practice of permitting farmers to save, exchange and resow seeds from the harvest of cross pollinated and self-pollinated plant varieties may be continued. For this purpose, it is also necessary to promote honest labeling practices.

Despite the presence of farmers and breeders privilege, if the government can ensure an improvement in the average seed replacement rates of important self/open pollinating cereal crops (which currently stand at a low 15-20%), it is likely that the private sector will be willing to undertake R&D in such crops.

Public Sector: Not all varieties for which protection is being sought by the public sector fall within species that interest the private sector. Therefore, to the extent that the public sector views the PPV&FR Act as a means to earning revenue for the know how transferred to the private sector, the number of species for which the public sector will seek protection (under both NV and EV categories) may reduce with time or match the filing interests of the private sector. This may be a strategic move and may not, on its own, be adequate to conclude that the public sector research interests

are moving away from self and open pollinated crops to crops for which hybrids are important. However, given the continuing private sector emphasis on hybrids, the government may need to adopt policy or regulatory measures to ensure that the necessary research and development of non-hybrid varieties of open/self-pollinating crops continues, particularly in the public sector research institutions and corporations.

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