RESEARCH ARTICLE

The Registration of Plant Varieties by Farmers in India: A Status Report

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Abstract: As a signatory to the Trade Related Aspects of Intellectual Property Rights (TRIPs) Agreement of 1994, India was obliged to enact legislation that brought plant varieties within the general purview of intellectual property. The Protection of Plant Varieties and Farmers' Rights Act, 2001, was enacted in fulfilment of that obligation. This article examines the issue of registration of crop varieties by farmers in India under the Act. Trends in registration do not indicate that the Act has spurred innovation. The right to registration of farmers' varieties has served primarily as a means to recognise the past contributions of farmers to the preservation of traditional biodiversity. No tangible pecuniary benefits have as yet accrued to farmers who have registered their varieties, and, in the circumstances, the value of farmers' varieties may lie mainly in their use for further research. The lack of data on the use of farmers' varieties in India creates difficulties in determining their true role within the agricultural sector. The registration process may therefore be useful in ensuring that the use of traditional varieties is adequately documented. There is an urgent need to extend the five-year time limit imposed on the registration of farmers' varieties in order to ensure that all such varieties are documented and preserved.

Keywords: farmers' rights, plant breeders' rights, intellectual property rights, plant variety protection, traditional varieties.

Introduction

This article examines the issue of registration of crop varieties by farmers in India. The legal right of farmers to register crop varieties was established by the Protection of Plant Varieties and Farmers' Rights Act, a law that was enacted in 2001 and which came fully into operation in 2007. This article looks at all applications filed by farmers from the inception of the Act until 2011–12, disaggregating data on these applications

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by individuals, crops and States. The article further examines the benefits, to farmers and society in general, of such registration.

As a signatory to the Trade Related Aspects of Intellectual Property Rights (TRIPs) Agreement of 1994, India was obliged to enact legislation that brought plant varieties within the general purview of intellectual property. India was one of the first countries in the world to enact an intellectual property law on plant varieties that brought the concerns of farmers within its ambit. The legislation, called the Protection of Plant Varieties and Farmers' Rights Act, 2001, began substantially to be implemented from 2005.

Originally, agriculture was wholly outside the purview of intellectual property law in India. From the 1980s, India was under pressure from the advanced capitalist countries, and organisations such as the General Agreement on Tariffs and Trade (GATT) and later the World Trade Organisation (WTO), to enact law that brought plant varieties within the definition of intellectual property. In the perspective of these countries and institutions, intellectual property rights served as a means to recognise and reward a person or group for innovation.

Under the WTO's TRIPs Agreement, a universal system of rules has been put into place with regard to issues such as patenting, trademarks, and copyrights. Article 27.3 of the TRIPs Agreement brought plant varieties within its ambit. According to its requirements, countries were obliged to protect plant varieties either by ensuring patentability, or by enacting laws specific to their own societies (a "*sui generis* system"), or by a combination of the two.

India chose the second option. The *sui generis* system in India was to be one based on the concept of plant breeders' rights. The process of drafting legislation began in 1993 and drafts of the law underwent many revisions, culminating in the enactment of the Protection of Plant Varieties and Farmers' Rights Act in August 2001. Although India chose the *sui generis* option, thus rejecting the alternatives of both a full patent regime and a combination of patent and *sui generis* regimes, the transition to a *sui generis* system did nevertheless mark a major change in policy. This is because, in accepting a *sui generis* system, India moved decisively away from a system that considered plant wealth to be part of the people's common heritage, to one where returns to the development of plant varieties were based on private property and pecuniary reward.

Defining Farmers' Rights

In 1989, the Food and Agricultural Organisation (FAO) of the United Nations defined farmers' rights "as rights arising from the past, present and future contributions of farmers in conserving, improving, and making available plant genetic resources, particularly those in the centres of origin/diversity" (Resolution 5/89). Two reasons

are generally given in the literature for the protection of farmers' rights as defined by FAO. First, it has been held that protection of farmers' rights creates incentives for the preservation of crop genetic resources.[1] This is called the "conservation" argument.

> The conservation rationale behind "farmers' rights" lies in the fact that it can provide a framework within which farmers/farming communities can appropriate some of the global values of agro-biodiversity, thus creating a structural incentive for the retention of plant genetic resources. (Srinivas 2003)

Secondly, it has been held that protection of the rights of farmers in developing countries helps them face the onslaught of the intellectual property rights regimes of the developed countries.[2] This is referred to as the "equity" rationale.

> There is a fundamental asymmetry between rewards accruing to plant genetic resources that form the basis of development of new varieties and rewards accruing to new varieties that are the products of research. Farmers' rights provisions represent an attempt to redress this asymmetry in the reward structure. (*Ibid.*)

An important feature of the concept of farmers' rights in the contemporary context is that it recognises two distinct roles of farmers: farmers as cultivators and farmers as conservers. The former role refers to those farmers engaged in cultivation but not conservation, while the latter practise *in situ* conservation (Swaminathan 1998). The part played by farmers as innovators, however, has yet to gain adequate international attention. The Indian legislation may be the first to explicitly recognise the farmers' role as an innovator.

Section 2(k) of the Protection of Plant Varieties and Farmers' Rights Act, 2001, defines a farmer to be a cultivator (cultivating the land himself or through direct supervision), or one who conserves and preserves "any wild species or traditional varieties," or a breeder who adds value to such wild species and traditional varieties "through selection and identification of their useful properties." The Act also recognises farmers' varieties as

> those which have been traditionally cultivated and evolved by farmers in their fields, or those that are wild relatives, or land races of a variety about which farmers possess common knowledge. (Section 2(l))

In the Indian law, the abstract concept of farmers' rights takes the form of nine specific rights (Bala Ravi 2004). It is noteworthy that rights guaranteed under the Act are rights that accrue to farmers as cultivators and as plant breeders. Sections 39 to 46 of the Protection of Plant Varieties and Farmers' Rights Act, 2001, provide for the following rights:

[1] See Esquinas-Alcazar (1998); Brush (2005); and Ramanna (2006).

[2] See Esquinas-Alcazar (1998), Brush (2005); Cullet and Koluru (2003); and Cullet and Raja (2004).

Rights on seeds. These reflect customary practices which acknowledge the traditional rights of farmers in agriculture. They include the right to save seeds and use them for sowing, exchanging, sharing, and selling to other farmers.

Right to register. The Act allows registration of traditional varieties or farmers' varieties under Section 14. Once a variety is registered, farmers obtain the exclusive right to produce and market it. This right recognises the role of farmers as plant breeders and innovators.

Right to reward and recognition. This right recognises the role of farmers in preserving and developing agro-diversity. The National Gene Fund presents awards to selected farmers or communities in this regard.

Right to benefit-sharing. Farming or tribal communities that contributed to the development of a new crop variety are entitled to an equitable sharing of the benefits earned from it.

Right to compensation for losses. The Act requires that registered varieties be sold with a declaration regarding their agronomic performance and the conditions needed to ensure successful cultivation. This right guarantees compensation to farmers who are victims of exaggerated claims regarding the performance of newly registered varieties. The right thus serves as a means to prevent unfair marketing practices by breeders and seed sellers.

Right against undisclosed use of traditional varieties. This provision protects farmers when a commercial breeder makes undisclosed use of a traditional variety. Farming communities are seldom able to detect the use of "their" varieties or traditional knowledge in the breeding of a new variety. In such situations, any third party who has a reasonable knowledge of the use of traditional methods in the breeding of the new variety is eligible to file a claim for compensation on behalf of the concerned local or tribal community.

Right to access to seed. If farmers are to benefit from scientific crop improvement, it is self-evident that they need access to seeds. While allowing a plant breeder the exclusive right to the commercial production and marketing of seeds of the varieties registered in their names, the Act also directs that breeders meet farmers' demand for seeds at reasonable prices.

Right to free services. The Act exempts farmers from paying any fees at any stage of the registration of a variety.

Right to protection against accusations of infringement. A farmer cannot be prosecuted on charges of infringement of another's title to a variety if he or she affirms ignorance of the legal provision deemed to have been violated by him or her.

This provision protects people of low legal literacy from harassment, particularly by seed companies.

Once a plant breeder's right (PBR) is established in favour of an applicant, it confers on her a right of legal ownership similar to any other property right. Under the existing regime, it is necessary to ensure that farmers' varieties that have been developed indigenously are not usurped or claimed by larger organisations or private sector entities, thus denying farmers the benefits that should rightfully accrue to them.

Categories of Plant Varieties

The Plant Registry and the Plant Variety Protection and Farmers' Rights Authority envisaged under the Act were established in 2005. The process of operationalisation was completed in 2007, when acceptance of applications for registration of plant varieties began.

The Act provides for three different, though not mutually exclusive, categories of plant varieties: new, extant, and farmers' varieties. "Extant varieties" are defined as varieties that are available in India and have been notified under Section 5 of the Seeds Act, 1966,[3] or farmers' varieties, or varieties about which there is common knowledge, or any other variety that is in the public domain. "Farmers' varieties" are defined as varieties that have traditionally been cultivated and developed by the farmers in their fields, or varieties that are a wild relative or land race of any variety about which farmers possess common knowledge.

Another category of plant variety is that of the "essentially derived variety," which is any variety that has been derived from a new, extant, or farmers' variety that has been registered under the Act. The Act also mandates that where an essentially derived variety is developed from a farmers' variety, the permission of the concerned farmer or farmers' community must be obtained. Where a farmers' variety has been registered, the process of tracing the party from whom permission should be obtained is likely to be fairly easy. However, in the case of those farmers' varieties that have not yet been registered, ascertaining the true owner is likely to prove more difficult. At present, the Authority addresses this issue on a case-to-case basis. In some countries, in order to qualify for an essentially derived variety, the initial variety has to be registered; in others, the registration of the initial variety is not required. Where registration of the initial variety is not mandatory, the terms of registration are determined by mutual negotiations between the breeder of the initial variety and the breeder of the essentially derived variety. The current official position in India, however, is that the initial variety must be registered (although this view has been contested by some officials). It has been acknowledged that, in practice, given the

[3] In brief, these are seeds whose quality the Government of India considers it necessary to regulate for agricultural purposes.

size of the country, plant breeders are likely to have used farmers' varieties as initial varieties without permission.[4]

Registration Procedures

Stages of Registration

As we have written, the right to registration recognises the role of the farmer as plant breeder and innovator. The operationalisation of this right under the Act was intended to serve as a crucial means of protection of the farmer from exposure to a full patent regime characterised by complete privatisation of intellectual property rights.

An application goes through two stages prior to registration. First, all applications received by the Authority are compiled and published on its website. In the second stage, only those varieties whose applications have been granted certification for "DUS" (distinctiveness, uniformity, stability) testing are subsequently published in the *Plant Variety Journal of India*, the journal published by the Authority.[5] At this stage, any objections to registration may be put forward for consideration. The details of an application are posted in the *Plant Variety Journal of India* once it is approved for registration.[6] The specific purpose of such publication is to ensure that there is no opposition to the applicant's claim to the particular variety. Every application requires a processing time, which may range from 8 to 20 months. Registration is granted on the basis of the denomination, also called the "the label or title" of a variety.[7] Once a variety is registered, it is again advertised in the *Plant Variety Journal of India* as a registered variety.[8] The breeder then has the exclusive right to market and produce the crop for a period of 15 years in the case of annual crop varieties, and for 18 years in the case of trees and vines. In addition, the Act provides that where derived varieties are developed from farmers' varieties, permission must be obtained from the farmers' community or individual farmers before commercial production.

Problems of Registration

When the law was being drafted, domestic and multinational companies opposed the sections of the Bill that provided for the registration of extant varieties. Despite stiff

[4] Communication with the Protection of Plant Varieties and Farmers' Rights Authority in February 2012.

[5] In addition to distinctiveness, uniformity, and stability (DUS), a new requirement—the novelty criterion—has been added to the registration process for new varieties. The novelty criterion, whose title is self-explanatory, is not applicable in the case of farmers' varieties, mainly because farmers' varieties are likely to be available in the public domain and hence cannot be classified as "new."

[6] Approval here means notified under the Seeds Act, 1966, in the case of extant varieties, and approved for distinctiveness, uniformity, and stability testing in the case of farmers' and new varieties.

[7] G. B. Pant University of Agriculture and Technology (2011), p. 43.

[8] This description of the sequence is based on interviews conducted between May and December 2011 with officials at the Protection of Plant Varieties and Farmers' Rights Authority, New Delhi.

opposition, however, Parliament went ahead and included this provision in the new law. The legislature has, however, now come to accept the view that the time period for the registration of extant varieties cannot be indefinite. The current official view is that once the registration of extant varieties (including farmers' varieties) for any particular crop species is completed, only new varieties of that crop species should be open for registration.[9]

When Rules under the Act were being drafted, the Protection of Plant Varieties and Farmers' Rights Authority imposed a three-year time limit on the acceptance of applications for extant varieties. In other words, all applications to register extant varieties had to be filed within three years of the notification of the relevant crop under the Act. In order to ensure that all extant varieties were covered, this time limit was subsequently raised to five years. The five-year time period expires in 2012.

Despite the extension from three years to five, the time constraint is likely to undermine the process of registration of all extant varieties in the country. There are various arguments in favour of extending the time limit further. First, there are no data on or estimates of the number of farmers' varieties in existence, or on the current state of use of farmers' varieties. Secondly, the Protection of Plant Varieties and Farmers' Rights Authority has acknowledged that very few farmers are actually aware of the right to registration.[10] Thirdly, the data show that it takes much longer for a farmer to register a variety than it does for a private sector entity. A likely reason for this is the informal nature of the breeding and conservation processes that characterise farmers' varieties. Various technical details such as difficulty in determining parental lines, lack of comparative data with other varieties, lack of varietal characterisation, and failure to obtain the appropriate endorsement of applications have often proved to impede the process of registration of farmers' varieties.

Given these factors and the importance of the task, we believe that a further extension of the time limit for registration of extant varieties is imperative. Such extension is possible under the Act. The Act provides that, under exceptional circumstances, the Registrar may apply his discretion to accept any variety for registration even if the time limit is exceeded, provided that suitable justification is given. Currently, a proposal has been moved to empower the Authority to fix a suitable time limit for registration.

It is worth noting that, for the individual farmer or group of farmers, being able to register a plant variety is no guarantee of being able to make a profit from that variety, or even to put the variety into commercial production. To convert the legal

[9] Based on communications with officials at the Protection of Plant Varieties and Farmers' Rights Authority, May to December, 2011.
[10] Based on information provided by officials at the Protection of Plant Varieties and Farmers' Rights Authority; interviews conducted between May 2011 and December 2011.

right into an income-bearing possibility requires that other conditions be fulfilled. These include:

> seed production, determining and labelling 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. (Kocchar 2010)

Individual and Community Registration

In 2011, in order to accelerate the registration process, experts recommended different methods (or "models") of registration. Two such models are in use: registration initiated by an individual farmer, and registration by or on behalf of a farming community by using panchayat-based systems or by means of registered societies. Three other models have been put before the Government of India for consideration. At present, the Department of Science and Technology plays a larger role than the Department of Agriculture with respect to promoting farmers' varieties and their registration.[11] A majority of the applications have been filed on behalf of farming communities and not individual farmers. These varieties fall within the ambit of traditional knowledge. In this sense, then, the right to registration also acts as an instrument to protect traditional knowledge and confer the benefits of ownership on communities.

A real issue here is that the term "community" has not been defined by the Act. The interpretation of the term has largely been left to the discretion of the Authority. It may be taken to mean a group of farmers having a common interest in production, conservation, or marketing. In addition, they may belong to a particular tribe or community, or be from a specific locality or place, or share some other identifying factors.

There is no specific requirement that a farmers' community has to be registered. There are instances, however, of groups being registered as producers' groups or societies under different Acts. Every application that is submitted under the Act for a farmers' variety, however, must be endorsed by a government agency or official, such as the District Agricultural Officer, Block Development Officer, or District Tribal Officer, or by the Director of Research in a State Agricultural University or research institute, or by reputed NGOs. Such endorsement is intended to serve as an acknowledgement of the authenticity of the community.[12] At present, only two farmers' communities, Swatantrata Sainani Jaivik Krishak Samiti and Rishi Parasar Jaivik Krishi Shodh Samiti, have been granted registration.[13] The absence of a clear

[11] Based on interviews conducted with experts at the Department of Genetics, Biotechnology, and Intellectual Property Rights, G. B. Pant Agricultural University, Pantnagar, Uttarakhand, June 2, 2011.

[12] Based on communication with Protection of Plant Varieties and Farmers' Rights Authority, January 3, 2012.

[13] These communities breed the Tilak Chandan and Hansraj rice varieties.

definition of the term "community" under the Act, coupled with the informal nature of many farmers' groups and organisations in the country, may create confusion with respect to the ownership of varieties, thus leading to substantial difficulties in identifying beneficiaries.

Progress in Filing Applications

The Protection of Plant Varieties and Farmers' Rights Authority opened the registration procedure in 2007 for 14 crop species. The first list covered genera of cereals (rice, bread wheat, maize, sorghum, and pearl millet) and pulses (chickpea, pigeon pea, lentil, green gram, black gram, field pea, and kidney bean). The second list included two commercial crops, cotton and jute (Kochhar 2010). At present, a total of 54 crop species have been notified for registration. Since 2007, a total of 969 applications for new varieties, 1,423 applications for extant varieties, and 226 applications for farmers' varieties have been filed with the Authority.[14] Of these, 327 applications have been granted registration, including three applications for farmers' varieties.

A total of 226 applications for farmers' varieties have been filed with the Authority. Of these, only three varieties (all from Uttarakhand), namely, Tilak Chandan, Hansraj (for farmers' communities), and Indrasan (for an individual farmer) rice varieties have been granted registration under the Act. Figure 1 illustrates the progress made in terms of the applications filed. The initial periods of registration, between 2008 and 2010, were marked by slow progress and a subsequent decline in terms of filing.

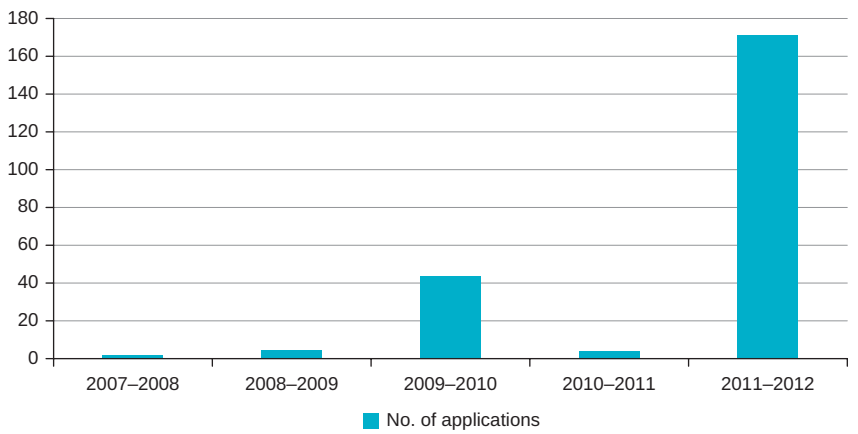

Figure 1 *Progress of applications for registration of farmers' varieties*
Source: Compiled from data available at http://plantauthority.gov.in/pdf/far-mer.pdf

[14] Compiled from data available on the Protection of Plant Varieties and Farmers' Rights Authority website, and all issues of the *Plant Variety Journal of India* from July 2009 (vol. 3, no. 7) to January 2012 (vol. 6, no. 1): http://plantauthority.gov.in/publications.htm, viewed on August 2, 2012.

This may be attributed to various factors. The lack of information among farmers has been cited as a primary cause. Most farmers and farmers' communities lack the knowledge or resources to pursue action in respect of the registration process. It was only with the increased involvement of various facilitating organisations that the number of applications rose. As a result, we see that there was a significant rise in the number of applications received by the Authority in 2010–11. That this increased momentum was achieved mainly due to the large number of applications filed from the state of Odisha is a matter of no small interest. The pace at which the filing of applications has increased in the last year 2011–2 has also been a reflection of the urgency to file within the prescribed period.

While farmers' communities filed most of the applications, individual farmers have also participated in the registration process. Information obtained from the Authority shows that a total of 7 farmers have filed 16 applications for registration of their varieties (as illustrated in Table 1). Four farmers fall within the category of small farmers, while two may be considered medium or large farmers (this observation is based on self-reported data). Many of these farmers have developed more than one variety. For example, Dada Khobragade from Maharashtra has developed DRK and HMT rice varieties, and Kuldeep Singh Sandhu from Punjab has developed Mushknn, Basmati Ravi No. 1, and Wheat Ravi No. 1 varieties. These farmers have been engaged in the process of innovation for many years in order to improve the varieties that are at their disposal. Most of them were unaware of the provision for registration until various organisations provided them with assistance, and registration itself was carried out by the organisations on their behalf.

Table 1 *Landholdings of individual farmers*

Name of variety	Name of farmer	Landholdings (in hectares)
HMT	Dada Khobragade	1.4
Indrasan	Indrasan Singh	Not applicable
Sushil Laxmi	Balasaheb Patil	5.6
Mushknn	Kuldeep Singh Sandhu	< 1
Basmati Ravi No. 1	Kuldeep Singh Sandhu	< 1
Kudrat 9	Prakash Singh Raghuvanshi	1.4
Kudrat 3	Prakash Singh Raghuvanshi	1.4
Wheat Ravi No. 1	Kuldeep Singh Sandhu	< 1
Kudrat 7	Prakash Singh Raghuvanshi	1.4
Kudrat 11	Prakash Singh Raghuvanshi	1.4
Mahaveer Kishan Vardhan	Mahavir Singh Arya	< 1
MK Kranti	Mahavir Singh Arya	< 1
Richa 2000	Rajkumar Rathore Sehore	7.2
SR-1	Not available	Not applicable
DRK	Dada Khobragade	1.4
Chhohart U	Not available	Not applicable

Source: Compiled from information available from the National Innovation Foundation.

Crop-Wise Distribution of Applications

Based on the data available from the Plant Authority, the highest number of applications filed has been for rice varieties (210). Wheat (6), kidney bean (4), chickpea (2), pigeon pea (2), sorghum (1), and common bean (1) are the other crops for which applications have been filed. Despite the notification of 14 crops in the first phase of registration, applications were received for only 7 crops. Although a total of 54 crops have now been notified, there has been no increase in the number of applications filed for recently notified varieties. The phased notification for the registration of crops has been a contributing factor. While addressing the scope of the Act and the extent to which farmers' varieties will be covered by it, an official at the Authority told me that the possibility of registering farmers' varieties is greater for those crops that are richer than others in terms of diversity (e.g., rice, millets, mango, spices, citrus, and banana).[15]

State-Wise Distribution of Applications

Figure 2 is based on data that have been made available by the Authority. It is clear that the highest number of applications (170) have come from the State of Odisha. Most other States have contributed only marginally in terms of the registration process. There appears to be an overall lack of motivation in terms of pushing forward the issue of registration in many States. Applications for rice varieties from West Bengal (25) form the next largest grouping from a State, followed by Uttarakhand (10). The

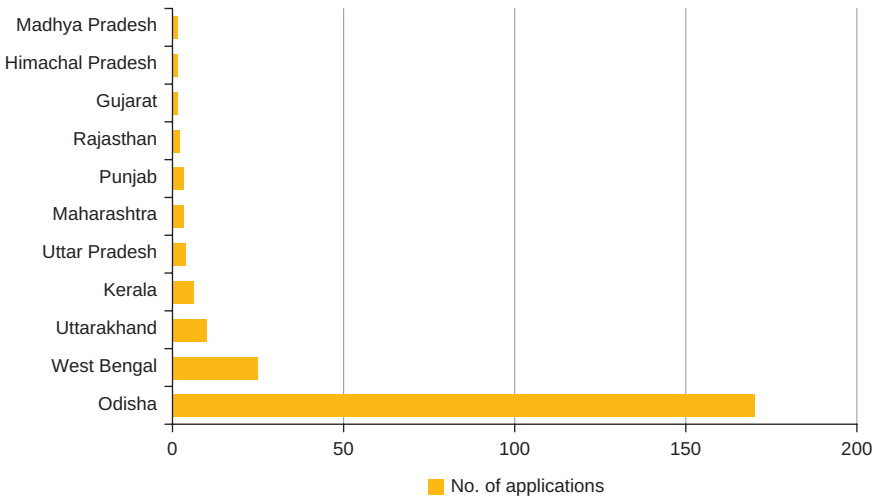

Figure 2 *State-wise distribution of applications*
Source: Compiled from data available at http://plantauthority.gov.in/pdf/farmer.pdf, based on information from officials at the Protection of Plant Varieties and Farmers' Rights (PPV&FR) Authority.

[15] Interview with Joint Registrar, Protection of Plant Varieties and Farmers' Rights Authority, May 28, 2011.

applications from both Odisha and West Bengal were only filed for farmers' varieties of rice and not for any other crop.

Organisations such as the National Innovation Foundation, the M. S. Swaminathan Research Foundation (MSSRF), and various State Agricultural Universities have been credited with facilitating the registration process on behalf of farmers. For example, the MSSRF has been active in assisting the registration process in Kerala and Odisha, while experts at the G. B. Pant Agricultural University have been assisting farmers' communities in registration of their varieties in the state of Uttarakhand and elsewhere.[16] With regard to carrying out programmes to generate awareness as well, most of the efforts have been made by these organisations.

The Case of Odisha

Given the large number of applications filed with the Authority that originate from Odisha, a brief account of the process carried out in the State is merited. A committee has been formed at the State level to monitor the progress of work on registration of farmers' varieties. At present, the State has collected 915 paddy varieties from farmers for registration under the Act. Both individual farmers and farming communities have been responsible for the submission of these applications. Two authorities, the Director (Agriculture and Food Production), Government of Odisha (for 891 applications), and the Director, Central Rice Research Institute (CRRI), Cuttack (for 24 applications), facilitated the applications.

Various officials of the State Department of Agriculture, including District Agricultural Officers and the Deputy Director of Agriculture, have been involved in collecting varieties. Varieties that are collected are purified at the State's seed testing laboratory. Thereafter the seeds, along with the requisite documentation, are sent to the Authority for registration. DUS (distinctness, uniformity, and stability) testing for these varieties is conducted within the State.

DUS testing for the first year is complete. The panicles, DUS testing characteristics, and pure seeds for more than 600 varieties have already been collected. DUS testing in the second year for 130 varieties is currently being conducted, and organised jointly by the CRRI, Cuttack and the Directorate of Rice Research (DRR), Hyderabad.[17]

The varieties that were initially collected came mainly from groups of farmers or farming communities, as the varieties were traditionally cultivated and preserved by farmers because of their adaptability in the regions from where they were collected.

[16] Interview with experts at the G. B. Pant Agricultural University, dated June 2, 2011.
[17] Information obtained from the Department of Agriculture, Odisha; letter dated December 24, 2011.

Of the 891 farmers' paddy varieties collected for registration, 60 to 70 per cent were collected from individual farmers and the rest from groups of farmers.[18]

There are an estimated 340 traditional paddy varieties cultivated in Odisha (primarily within the Jeypore region) that have been documented by organisations such as the M. S. Swaminathan Research Foundation. The need to protect traditional varieties and biodiversity that originate from the state of Odisha has now received international recognition, and in a form quite different from the farmers' right to registration guaranteed under the Protection of Plant Varieties and Farmers' Rights Act, 2001. In 2012, the Food and Agriculture Organisation of the United Nations identified traditional agricultural practices within the Koraput region of Odisha as a candidate for recognition as a Globally Important Agricultural Heritage System (GIAHS).

Problems of Registration

Interviews with the farmers and farming communities that have been granted registration indicate that even though registration certificates were granted in 2009, no particular pecuniary benefits have been realised.[19] The absence of an effective distribution network and an inability to advertise inhibit the prompt accrual of benefits. There are many traditional varieties of staple crops that are cultivated simultaneously in different parts of India. Monitoring such a network for infringement and unlawful pecuniary gains could prove near-impossible. Further, no notification of registration of varieties had been published in local newspapers, although farmers are supposed to be encouraged to make such announcements in the print media.

Large farmers may be able to prove the origin of their innovations; small farmers generally lack the resources to do so. The requirement that innovators ensure that varieties conform to DUS criteria is difficult for small farmers to fulfil. It is clear that farmers need facilitators to work on their behalf, and public sector institutions have a vital role to play in this regard. As we have seen, most farmers and farming communities have been encouraged to apply for plant breeders' rights by organisations such as the National Innovation Foundation, G. B. Pant Agricultural University, the M. S. Swaminathan Research Foundation (MSSRF), the Government of Odisha, and so on.

The burden of enforcement is an additional weight on small farmers who have been granted plant breeders' rights for their varieties. Processes of monitoring the sale of varieties and initiation of proceedings in the event of infringement are fraught with difficulties. Given the resource constraints of this group of farmers, while

[18] Information provided by the District Agricultural Officer, Department of Agriculture and Food Production, Odisha.

[19] Based on a series of interviews conducted between May 2011 and June 2011 with individual farmers and farmers' communities in Uttarakhand who have been granted registration for their varieties, or are awaiting action on their applications.

the Act exempts them from paying any fees in this regard, various other ancillary institutional charges are incurred. Also, while farmers may be exempted from legal action on grounds of ignorance of the law, tracking the sale of varieties by other means and sources is very daunting indeed. The sheer extent of the geographical area of India is bound to create problems in monitoring the distribution and sale of farmers' varieties. In addition, although various tribal communities have been engaged in preserving traditional knowledge and farming practices, they have received little assistance in terms of the registration process.

Concluding Discussion

As a result of international pressure and domestic policy changes, India has established an intellectual property rights regime that covers plant varieties. This is in keeping with an entire philosophical framework that accords primacy to property rights as a means to encourage economic development. Within this framework, India has chosen to put in place a *sui generis* system, one that has the declared objective of protecting farmers' rights. The Protection of Plant Varieties and Farmers' Rights Act is the legislative expression of this commitment of the Indian state. This article reviews the registration of plant varieties under the new law. The article is therefore a status report; the progress of registration under the Act and the consequences for farmers must regularly be updated and reviewed.

The farmers' right to registration seeks to provide exclusive ownership and benefit to individual farmers or farming communities in recognition of their role as breeders or innovators. At present, any effort at evaluation is affected by problems of measurement and other methods of assessment of the exact effects of the use of plant variety protection mechanisms in agriculture.[20] The issue of concern for developing countries like India rests on how best to harmonise the new system with the interests of economically and politically vulnerable groups and classes, particularly among the working people of rural India.

The absence of data on the extent to which farmers' varieties are in use in India creates difficulties in terms of determining their true significance within the agricultural sector, both now and in the future. The registration process may therefore serve as an important means to document such traditional varieties and ensure their protection in terms of preserving biodiversity in the country. However, the time limit placed on the registration of extant varieties poses a serious problem in this regard.

Farmers' varieties remain an area where little research has been conducted, perhaps due to its relatively recent emergence as a separate category for study. Farmers' right

[20] Studies of intellectual property rights and the protection of plant varieties in different countries show varying results, and it is still difficult to make cross-country generalisations in this regard. See, for example, Lesser (1997); Srinivas (2003); Kanwar and Evenson (2003); and Louwaars *et al.* (2004).

to registration in India provides little justification for the claim that property rights provide impetus to the process of innovation.[21] In India, the data available indicate that applications for registration of most farmers' varieties are motivated by a perceived need to protect traditional knowledge. Of the few varieties developed by individuals, there is little evidence to suggest that any form of protection of intellectual property rights served as a motivating factor. Most of these varieties had been developed in the decades preceding the enactment of any form of plant variety protection in India. Indeed, this evidence points to other factors motivating innovation among farmers, particularly ecological factors such as resisting persistent pest attacks, dealing with difficult climatic conditions, and so on. The right to registration of farmers' varieties may serve more as a means of reward and recognition to farmers for past contributions than as a factor that will push the innovation process forward. In addition, the literature also indicates that the impact of intellectual property rights protection on innovation generally differs on a crop-by-crop basis (Srinivasan 2005).

In the literature on intellectual property, another popular justification for this new intellectual property regime with respect to plant life is that breeders (in this case, farmers) will gain commercially as an outcome of being granted plant breeders' rights. In India only three farmers' varieties have been registered till date. Two of these belong to farmers' communities, while one has been conferred on an individual farmer. Based on the information available from communication with these groups and the data available, no direct tangible commercial benefit from the sale of varieties had accrued to the farmer innovators at the time of the interviews.[22] While some innovators received monetary benefits in terms of awards from organisations such as the National Innovation Foundation and the Protection of Plant Authority, the expectation that the sale of such varieties will bring in larger commercial gains to the breeders remains unfulfilled.

Most farmers' varieties are local and are cultivated within specific geographical conditions. The commercialisation of farmers' varieties is thus likely to bring only marginal gains over time, in contrast to other extant and new varieties that have been registered. Farmers' varieties may not necessarily be developed for commercial purposes, but may be valuable for certain good characteristics (for example, the Indrasan variety has a better recovery rate of rice from paddy). Many farmers' varieties may not be high-yielding, but may possess certain beneficial traits that could aid in further research and in the development of new varieties.

We have seen that the rate of filing applications for farmers' varieties has been slower than the rate of filing by the state and private sectors. Lack of awareness and

[21] For a basic review of the literature relating to plant variety protection and innovation, see Lesser (1997) and Louwaars *et al.* (2004).

[22] Based on a series of interviews conducted between the months of May 2011 and June 2011 with individual farmers and farmers' communities in Uttarakhand who have been granted registration for their varieties.

complex procedures are often cited as reasons for this disparity. Improvements with respect to filing applications over the past year have been due mainly to various organisations that have acted as facilitators on behalf of the farmers. It is imperative that public sector institutions play a bigger and formal part in ensuring that all farmers' varieties are covered. The active participation of the State Government of Odisha in encouraging the registration of farmers' varieties is a useful example in this regard; the effectiveness of the State government in promoting registration in Odisha can provide useful insights to other States, and merits more in-depth analysis.

The multiplicity of legislation in India creates overlapping institutions. The objectives of policies with respect to different aspects of plant genetic resources and farmers' rights are often at variance with one another. The influence of international treaties like the Union for the Protection of New Varieties of Plants (UPOV), the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), the Convention on Biodiversity, and the Trade Related Intellectual Property Rights (TRIPs) Agreement are reflected in the form of various domestic laws such as the Protection of Plant Varieties and Farmers' Rights Act, 2007, the Biodiversity Act, 2002, the Seeds Bill, 2011, and others. The divergent objectives of these laws tend to create confusion in terms of policy in India.

The five-year time limit for the registration of extant varieties is due to end in 2012. After this period, registration of extant varieties will only be permitted on a case-by-case basis and only where the Registrar of the Authority deems fit. Given the vastness of the field and the number of potentially registerable varieties, the very concept of putting in place a closing date for the registration of extant varieties, as the legislation does, is unrealistic and counterproductive.

Nevertheless, we must continue to analyse the impact of the registration of farmers' varieties on farmers' livelihoods, and the social benefits that the right to registration was intended to generate. With the current time limit due to expire this year, more concrete results are likely to emerge after 2012–3.

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