Impact of Intellectual Property Right on Development and Use of Hybrid Crop Varieties in Developing Countries: Thailand Experience*

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Abstract

Current developments in Intellectual Property Rights (IPRs) do pose some threats to public sector research and development institutions. The patent protection of parent materials and genes in plants as well as the finished varieties of crops could block public disclosure of research results and the free flow of genetic resources. It is, therefore, necessary to have an Act such as the Plant Variety Protection (PVP) to avoid this problem. Few countries in Asia had drafted such an Act as the PVP, and Thailand completed it in 1999. However, the Thai PVP Act follows neither the 1998 UPOV, nor the 1991 UPOV. This Act protects new varieties, indigenous varieties, and traditional local varieties as well as wild plant species. The protection of new plant varieties follows the principle as set by UPOV. The new varieties are those that meet the criteria of distinction, uniformity, and stability. The indigenous plant varieties are those specific plant varieties present only in specific localities within a country and have not been registered as new varieties. Traditional local varieties are those that originate within the country in which they are widely used by farmers. Wild plant species are those collected from the wild and are not yet improved or altered.

The PVP Act of 1999 is a specific law used in the protection of plant varieties. In fact there are many existing laws related to the protection of specific biological resources. In order to have a linkage of all these laws, the country has come up with the Office of the Prime Minister’s Regulations on the Conservation and Utilization of Biodiversity that has been implemented since January 2000. Under this Regulation, a new autonomous government body, Thailand Biodiversity Center (TBC), has been established under the umbrella of the National Science and Technology Development Agency (NSTDA). TBC acts as the secretariat of the National Committee on the Conservation and Utilization of Biodiversity chaired by the Deputy Prime Minister who is in charge of environment. It is anticipated that this soft law, together with the PVP Act, would improve the management of biological resources of the country.

Keywords: Intellectual Property Rights, Plant Variety Protection, hybrid varieties, open-pollinated varieties, inbred lines, germplasm, International Rice Genome Sequencing Program, Indigenous Plant Varieties, Convention on Biological Diversity.

Introduction

Current developments in Intellectual Property Rights (IPRs) do pose some threats to

to have an Act such as the Plant Variety Protection (PVP) to avoid this problem.

Traditional plant breeding has contributed to yield increase since the beginning of agriculture. From improved, open-pollinated (OP) varieties, it turned to the development of hybrid varieties. In 1879, W.J. Beal of Michigan State showed that the cross between two distinct maize lines resulted in hybrid variety with higher yield than both parents (Briggs and Knowles 1967). There have been many success stories on maize hybrid variety development that later extends to the improvement of self-pollinated crops such as wheat and rice. With available tools from advanced biotechnology, research and development on hybrid crop varieties could be further strengthened.

Hybrid crop variety development in developing countries is rather slow. Within these resource-poor countries, farmers still prefer to save seed for next season planting. Only hybrid maize has been doing well in some countries such as Thailand, China, India, Pakistan, Philippines, and Indonesia. Presently though, Thailand is the center of research and development of maize hybrid varieties. Public institutions such as Kasetsart University and the Department of Agriculture have developed many high-yielding OP varieties and inbred lines. These have served as base germplasm for private agency breeding programs within the country.

As the world leader in rice export, Thailand has developed many improved rice varieties. The most popular rice variety is the Khao Dok Mali 105 (KDML 105), an aromatic rice. At present, Thailand has not joined other developing countries such as China, Vietnam, and India in hybrid rice production, but research and development in this field has already begun. With the participation of the International Rice Genome Sequencing Program (IRGSP), it is anticipated that many new rice varieties will be developed in the future.

There are many more improved crop varieties such as field crops, fruit crops, and cut-flowers. Fruit crops such as durian, mango, mangosteen, rambutan, longan, and others are diverse in varieties. Some of these varieties have been developed by the farmers. Since there is no intellectual property protection on these varieties, some of them have been taken away and planted in other countries. Thailand has completed its Plant Variety Protection Act in 1999 and hopes that the problem will be resolved, awaiting a few more details in implementation however, before enforcing this Act. The following discussion will be made on how this PVP Act would protect traditional varieties, lines, and hybrids.

**Public Research Institutions’ IPRs Policies**

At present, closer public-private collaboration on research and development is encouraged. Private companies could obtain plant varieties from the Consultative Group on International Agricultural Research (CGIAR) Centers and from the National Agricultural Research Systems (NARS). Therefore, these public research institutes should have a policy in place regarding Intellectual Property. The International Center for the Improvement of Maize and Wheat (CIMMYT), for example, has recently announced its new policy on intellectual property (IP) to ensure that CIMMYT’s resources will remain available to scientists in both public and private sectors.

As a non-profit international research institute, CIMMYT regards its research products as international public goods and previously did not have a policy of protecting its research discoveries. Under this new policy, CIMMYT may seek to protect the products of its research through some kind of IP systems. Other members of the CGIAR are currently considering similar steps (Anon. 2000).

Among developing countries in Asia, few countries have IP system in place for crop variety protection. Thailand is one of those, and will be used as the example for this paper’s case study.

**Thailand Intellectual Property Systems**

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In Asia, few countries have developed their Plant Variety Protection systems. Japan is a member of the UPOV, and therefore has adopted that system. India had completed a draft in 1994 (Swaminathan 1994), but has yet to implement it. Thailand has established its Intellectual Property Act in 1979, with amendments made in 1992. The Act has the following key elements:

1. Patentable materials must be the products of ‘human invention’, not of natural products.
2. It must be a new or novel product without previous disclosure.
3. The invention involves inventive steps with value added or technological development.
4. The invention must be of industrial applicability leading to uses in the agricultural industry or commercialization.

Under Thailand IPR Act, there is some limitation in patenting living organisms. Article 9(1) states that microorganisms and any part of microorganisms collected from natur, as well as animals and plants, cannot be patented. So it does not protect traditional plant varieties and animal breeds. In case of microorganisms, individual cases must be considered separately for protection. In general, parts of microorganisms cannot be patented, but man-made parts may be considered, for example, modified Bt gene, isolated strains, purified strains, etc.

### Plant Variety Protection Systems

The Plant Variety Act of 1965 and its Amendment of 1992 under the responsibility of the Ministry of Agriculture and Cooperatives, protects the conservation, quality and import-export of plant varieties, but does not protect the new plant varieties, plant breeders, or the owners of the varieties. So, it is abundantly clear that the present IPR Act under the responsibility of the Ministry of Commerce does not protect plant and animal varieties. Thailand just completed the Plant Variety Protection Act with the approval of the cabinet and the parliament in 1999. The new PVP Act is now under implementation and does not follow neither the 1978 UPOV nor the 1991 UPOV. This Act protects new varieties, traditional local varieties, as well as wild species.

#### The Protection of New Varieties

The Protection of New Varieties follows more or less the similar principles set in the UPOV type. Articles in this section describe in details what a new variety is, and how it is protected. Only a few important points will be discussed:

1. The new varieties are those that meet the criteria of: distinction, uniformity, and stability (DUS). For purposes of protection, new varieties should not be commercialized within or outside the country more than two months prior to the date of application.
2. The plant breeder(s) who develop the new variety has/have the right to apply for the variety protection. In case of more than one breeder, it could be a shared application. If there is more than one application for the protection of the same new plant variety, the one who first submit the application will be granted the protection.
3. Any one who has filed for the protection outside Thailand applies for the protection of the same variety in Thailand within 12 months from the date first filed in other countries the protection will begin at the same date of that first application.
4. The acceptance of the application will be announced officially and the protest against the application can be made within 90 days.
5. The protection period varies according to the nature of plant. For annual crops the protection is for 12 years; for perennial crops, 17 years; and for trees, 27 years.
6. There are exceptions for research and farmers’ uses.

It is anticipated that both public and private agencies will register for the protection of their inbred lines and new varieties.
The Protection of Indigenous Varieties

In Section 4 of the Act, the definition of the Indigenous Plant Varieties was given as: they which are those specific plant varieties developed by a community and have never been registered as new varieties. That the community has exclusive rights, after registration, and the accession of those varieties needs approval and negotiation for the benefit of sharing with the community. The protection in this part follows the Convention on Biological Diversity (CBD) guidelines.

Traditional Local Varieties and Wild Plant Species

Under this Section, descriptions of the traditional local varieties, and wild species have been given as: traditional local varieties are those originated in the country in which they are widely used by farmers. They are neither new, indigenous varieties, nor wild species. Wild species are those that still remain under natural ecosystems and never been cultivated.

It is stated in this Section that any body who wants to make commercial use of these varieties or their plant parts should seek approval from the authority. The fees and benefit sharing should be negotiated and income from the uses of the plants must be paid to the authority.

The sharing of benefits has been described in detail but some arguments may still exist. For example, what is the local community as specified in the text and who should have the right to share the benefits? It may need to develop a clearer guideline for implementation later. In any case the Plant Variety Committee has been set up by the Government to assist its implementation.

The PVP Committee and Trust Fund

In Section 1, the PVP Committee is described. The Committee is working hard to resolve all obstacles and outstanding issues. The details in the establishment of a trust fund are also described in Section 6. The fund will be used in supporting all activities related to plant variety protection. Benefit sharing will also be made with local communities.

The Office of the Prime Minister’s Regulation on the Conservation and Utilization of Biodiversity

The above laws are supposed to enable the country in protecting its biological resources. However, the implementation of these laws is not as effective as anticipated, may be due the lack of completeness together with poor management. The Office of the Prime Minister’s Regulation on the Conservation and Utilization of Biodiversity, as a soft law, may be used as a stopgap measure and as a linkage to this law.

The Office of the Prime Minister’s Regulation went into force in January 2000. Under this Regulation, the new autonomous government body, the Thailand Biodiversity Center (TBC), was established under the umbrella of the National Science and Technology Development Agency (NSTDA). A policy board, the National Committee on the Conservation and Utilization of Biodiversity (NCCUB) is also linked to the National Committee on Environment (NCE). The NCE is chaired by the Prime Minister, and the NCCUB by the Deputy Prime Minister, who is in charge of the environment. It is anticipated that such an organization will function well in coordination with all public and private agencies, as well as NGOs and local communities.

References