

# Empowerment of Intellectual Property Rights in the Field of Plant Varieties to Support Food Security

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**ABSTRACT**— This research aims to examine to what extent the protection of new plant varieties through breeding activities can play a role in providing economic effects. Play a role in encouraging and supporting food security programs. Data were collected using documentation and literature study techniques, data analysis was carried out descriptively and qualitatively by tabulating the data obtained by the research objectives. This research uses qualitative methods to answer the formulation of the problem of empowering intellectual property rights in the field of plant varieties. To support food security, this type is normative-empirical, namely using a legal approach with additional empirical elements. Normative legal research is often also called doctrinal legal research, using a statutory approach and conceptual methods. The research results show recognition of the legality of ownership of plant breeding results as a form of public service. It requires awareness of two parties, namely the government itself in building campaigns and outreach, as well as by the breeders themselves both as individuals and as part of research/R&D institutions. Providing legality with the consequences of maintaining and enforcing the law will have a good economic impact on breeders.

**KEYWORDS:** Varieties; Resilience; Food, IPR

## 1. INTRODUCTION

The realization of the availability, affordability, and fulfillment of sufficient, safe, and quality food as well as fulfilling human rights guaranteed by the 1945 Constitution [21]. The state must maintain food stability while linking it to food security [1]. Food security with the ability of breeding activities has an impact on plant breeders who produce many varieties [19]. The world needs innovation in developing varieties because developing varieties will lead to the goal of producing superior varieties, which are needed in the context of food security and adaptation to climate change [16], [8]. For various reasons, with agronomic considerations, plant varieties can be improved to obtain better yields, quality, and resistance to biotic and abiotic stresses [26].

Generally, in modern agriculture, a plant variety is derived through plant breeding by crossing two or more parent lines that contain the desired characteristics [9], [11]. The desired characteristics are measured over several generations under different environmental conditions [12], [4]. Among the offspring, individuals with desirable characteristics are selected, while individuals with undesirable characteristics are eliminated from the breeding process. This process, repeated over several generations, can create favorable combinations of genetic variations in subsequent generations, resulting in superior varieties [3], [5]. To get better plant varieties so that it is profitable for farmers to use them, plant breeding needs to be done [2]. Utilization of the economic value of the breeder's rights to the plant varieties produced also receives legal protection under the Plant Variety Protection Act after going through a licensing process [22].

Recognize that developing new plant varieties requires a large investment of time and other resources [6].

Likewise, breeding activities often depend on substantial collaborative work between the private and public sectors or research institutions both on university campuses and government agencies through research and development institutions [18], [15]. The inclusion of indigenous people or communities can also provide significant benefits. Researchers have an important role in providing the quality of a variety that is compared based on standards of distinctiveness, uniformity, and stability. No less important is that all forms of plant breeding efforts must provide certainty of ownership and economic benefits for the breeder because this involves survival in providing the psychological message of ownership as wealth [23], [24]. Intellectual property protection in the form of plant variety protection can encourage the spirit of variety development by farmers/breeders. Especially if this is related to aspects related to food security [27].

The higher spirit of plant breeders in carrying out breeding activities that produce quality seeds of new plants, including food crops, encourages increased production of food crops, which has a strong influence on increasing national food security [7]. In facing the challenges of realizing food security in Indonesia, which includes high population growth rates which influence consumption levels, the influence of land conversion [28]. As a result of the decreasing area of agricultural land, dependence on imports to meet the needs of several strategic food commodities, and undeveloped technology transfer causes problems in increasing productivity which are still hampered, so serious efforts are needed from the government [13].

This research seeks to find answers to the research questions: 1) to what extent do plant breeding activities in Indonesia take place and obtain legal ownership; 2) To what extent do plant breeding activities have an impact on increasing food security in the country; 3) To what extent does strengthening the legality of ownership of plant breeding production results have an economic impact on plant breeders.

## **2. Research Method**

Data collection was carried out using data collection techniques in the form of documentation and literature studies, data analysis was carried out descriptively qualitatively by tabulating the data obtained by the research objectives [25]. This research uses qualitative methods to answer the formulation of the problem of empowering intellectual property rights in the field of plant varieties to support national food security. Researchers analyzed the literature and collected data. This type of research is normative-empirical, namely using a legal approach with additional empirical elements.

Normative legal research is often also called doctrinal legal research, using a statutory approach and conceptual methods. The aim is to identify legal concepts that are tools for the analysis and study of statutory regulations that form the basis for both repressive and preventive actions related to the problems raised in this research. Qualitative data collection was carried out in a documentation study in the form of a review of related legislation.

Legislative review is carried out on considerations that describe the philosophical basis for issuing laws, as well as on the content of the law which shows the substance of the regulations to be regulated. The documents studied are legislation in the field of plant variety protection, food, regulations, and policies in the field of plant variety protection and food security.

## **3. Result and Discussion**

### ***3.1 Plant Breeding and Legality of Ownership***

Plant breeding is an activity that can be carried out by farmers and also by agricultural research institutions, both official government institutions and university institutions. The purpose of plant breeding is to search for

new types of seeds to support food security efforts. All efforts made by plant breeders should have the effect of legality of ownership which keeps them away from illegal claims for their ownership of the results of their plant breeding work. Plant Breeding is a series of research and testing activities or activities to discover and develop a variety, by standard methods to produce new varieties and maintain the purity of the seeds of the varieties produced. Plant variety protection can be given to varieties that are proven to be unique and fulfill three requirements, namely distinctiveness, uniformity, and stability.

When a plant breeding process has gone through technical methods for testing uniqueness, uniformity, and stability through genotyping, molecular markers, and sequencing as well as its challenges and potential, the state is obliged to provide appreciation in the form of granting legal rights. The right to plant variety protection has been outlined in Law No. 29 of 2000 concerning plant variety protection. Plant Variety Protection is special protection provided by the state, which in this case is represented by the government and its implementation is carried out by the PVP Office, to plant varieties produced by plant breeders through breeding activities.

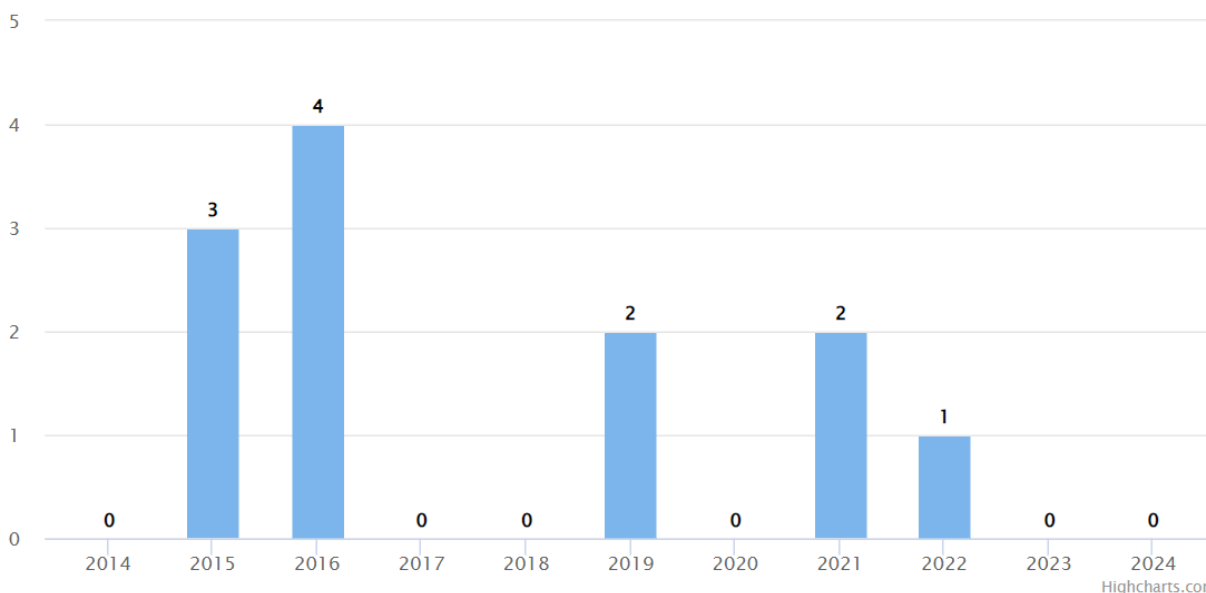
A variety is considered new if, at the time of receipt of the application for PVP rights, the propagation material or harvest from the variety has never been traded in Indonesia has been traded but not more than one unit, or has been traded abroad for no more than four years for annual crops and six years for annual plants. This novelty in the context of IPR is called Novelty because plant breeding should start from a basic idea resulting from experience or learning.

Uniqueness is also measured if the variety can be differentiated from other varieties whose existence is generally known [20]. The uniform criterion is if the main or important characteristics of the variety are proven to be uniform even though they vary as a result of different planting methods and environments. The criteria for a variety are considered stable if its characteristics do not change after being planted repeatedly, or if those propagated through special propagation cycles, do not experience changes at the end of each cycle.

Plant breeders who carry out breeding activities and register them will receive Plant Variety Protection Rights, namely special rights given by the state to breeders and/or PVP rights holders to use their varieties resulting from their breeding or approve other people or legal entities to use them for a certain time. The term special rights in the context of Intellectual Property Rights (IPR) is usually referred to as exclusive rights which give exclusivity to the plant breeder whether to use it themselves or give approval to another party through the practice of a permit agreement (license), especially in developing the economic rights of the breeder [10].

This right must be granted by the state, meaning that its protection must go through a registration process first. The registration received gives the said Breeder the power to carry out all actions regarding his plant variety.

Data on plant variety protection registration in Indonesia as of 2024 is as follows:



**Figure 1.** Registration every year

Source: National Research and Innovation Agency of the Republic of Indonesia 2024

**Table 1.** Registration every year

| No. | Variety Name                             | Institution                          | Registration Date | Registration Number | Certification Date | Certification Number | Ownership                                 | Status                             |
|-----|--|--------------------------------------|-------------------|---------------------|--------------------|----------------------|---|------------------------------------|
| 1   | Agogoanium 12                            | Badan Riset dan Inovasi Nasional     | 2022-08-01        | 26/Peng/08/2022     |                    |                      | BRIN, Pusat Riset Rekayasa Genetika       | Registered - Formalities Fulfilled |
| 2   | Bunga Lipstik Bravera                    | Lembaga Ilmu Pengetahuan Indonesia   | 2021-07-01        |                     | 2021-06-15         |                      | Pusat Konservasi Tanaman Kebun Raya Bogor | Registered                         |
| 3   | Kacang Hijau Muri                        | Badan Tenaga Nuklir Nasional (BATAN) | 2021-04-16        | 07/Peng/04/2021     |                    |                      | Pusat Aplikasi Isotop dan Radiasi         | Publication                        |
| 4   | Begonia Eka Karya                        | Lembaga Ilmu Pengetahuan Indonesia   | 2019-12-20        |                     | 2021-10-20         |                      | UPT BKTKR Eka Karya Bali                  | Certified                          |
| 5   | VARIETAS PADI TROPIKO                    | Badan Tenaga Nuklir Nasional (BATAN) | 2019-03-27        | 07/Peng/03/2019     | 2021-04-30         | 00511/PPVT/S/2021    | Pusat Aplikasi Isotop dan Radiasi         | Certified                          |
| 6   | Pisang Rejang Tetraploid                 | Lembaga Ilmu Pengetahuan Indonesia   | 2016-08-08        |                     | 2019-12-31         | 00473/PPVT/S/2019    | Pusat Penelitian Biologi                  | Certified                          |
| 7   | VARIETAS TANAMAN KEDELAI HITAM MUTIARA 2 | Badan Tenaga Nuklir Nasional (BATAN) | 2016-03-18        | 11/Peng/03/2016     | 2020-12-28         | 00505/PPVT/S/2020    | Pusat Aplikasi Isotop dan Radiasi         | Certified                          |
| 8   | VARIETAS TANAMAN KEDELAI HITAM MUTIARA 3 | Badan Tenaga Nuklir Nasional (BATAN) | 2016-03-18        | 12/Peng/03/2016     | 2020-12-30         |                      | Pusat Aplikasi Isotop dan Radiasi         | Rejected                           |
| 9   | Rhododendron hibrida - Cibodas           | Lembaga Ilmu Pengetahuan Indonesia   | 3/18/2016         | 11/Peng/03/2016     | 12/28/2020         |                      |   |                                    |

|    |  |                                      |            |                 |            |  |  |           |
|----|--|--------------------------------------|------------|-----------------|------------|--|--|-----------|
| 10 | VARIETAS TANAMAN KEDELAI HITAM MUTIARA 3 | Badan Tenaga Nuklir Nasional (BATAN) | 3/18/2016  | 12/Peng/03/2016 | 12/30/2020 |  | Pusat Aplikasi Isotop dan Radiasi                | Rejected  |
| 11 | Rhododendron hibrida - Cibodas           | Lembaga Ilmu Pengetahuan Indonesia   | 2015-11-16 |                 |            |  | UPT Balai Konservasi Tumbuhan Kebun Raya Cibodas | Retracted |
| 12 | Rhododendron hibrida - Jaka              | Lembaga Ilmu Pengetahuan Indonesia   | 2015-11-16 |                 |            |  | UPT Balai Konservasi Tumbuhan Kebun Raya Cibodas | Retracted |
| 13 | Rhododendron hibrida - Qanita            | Lembaga Ilmu Pengetahuan Indonesia   | 2015-11-16 |                 |            |  | UPT Balai Konservasi Tumbuhan Kebun Raya Cibodas | Retracted |

Source: Data processed at the National Research and Innovation Agency of the Republic of Indonesia in 2024

The above data shows that PVP registration activities are still minimal. Likewise, it is illustrated that even though the breeder mentions the name of an individual, the name cannot be separated from the institution that houses it. In the context of IPR, a person can carry out breeding activities, but if he is in an official (state) or work (private) bond then the breeding registration can be carried out by an institution, or jointly with an institution with individual breeders, or the breeder as a separate part of the institution. as a separate legal person. A glance at the data shows that PVP registration in Indonesia is still limited and dominated by institutions that concentrate on research and studies. Some of the applications were withdrawn, others were rejected. However, it can be said that some of them have been registered and published so that the PVP rights have become legal ownership, which makes it easier later to pursue the economy as a special right for the owner.

### ***3.2 The Impact of Plant Breeding on Food Security***

Food security is one of the government programs that coincide with international issues in the "Sustainable Development Goals" (SDG) package in the form of a program targeting food security without hunger and improving nutrition. Even more so. That the Government wants to ensure everyone's access to safe, nutritious, and sufficient food throughout the year and end all forms of malnutrition by 2030. Food security is one of the development priorities in the government's work plan [17]. The formulation of policies regarding the implementation of food security must be able to provide output that can lead to the stabilization of food availability based on self-sufficiency, as well as increasing ease of access and ability to access food.

The involvement of farmers and breeders offers a way to solve the problem of the suitability of plants to the target environment, recognize user preferences, determine breeding goals and priorities provide availability of genetic resources, efficiency of line selection, and commercialize seeds from selected varieties on farmers' fields. Investing in cultivars with special adaptability is very important in plant breeding, especially in unfavorable conditions, because each cultivation environment tends to be different. Policyholders increasingly need participatory methods to expand the adoption and impact of technological innovation, as well as manage the results of plant breeding so that they can be measured in absolute terms.

Food security is very important, which implies the condition of fulfilling food for the country and individuals, which is reflected in the availability of sufficient food, both in quantity and quality, safe, diverse, nutritious, equitable, and affordable and does not conflict with religion, belief, and culture. society, to be able to live healthy, active, and productive lives sustainably. It is a basic need for humans and its fulfillment is a human right guaranteed by the 1945 Constitution and the state is obliged to realize the availability, affordability, and

fulfillment of sufficient, safe, and quality food. The state's task to achieve food security is assessed from the pillars of food security, namely food availability, food access, food utilization, and food stability [14]. Food is everything that comes from biological sources, agricultural products, plantations, forestry, fisheries, animal husbandry, waters and water, both processed and unprocessed, intended as food or drink for human consumption which is used in the preparation, processing and/ or making food or drink.

### ***3.3 Legality of Plant Breeder Ownership and Economic Impact for Plant Breeders***

If a plant breeding activity is carried out, there are at least several impacts that are expected, one of which is the economic impact for the starter or the party who has the rights to the new variety. Reading data released by the National Research and Innovation Agency shows that registration of plant variety protection in Indonesia is still dominated by registration proposals from institutions such as the Indonesian Institute of Sciences (LIPI), the National Nuclear Energy Agency (BATAN) whose ownership records are in the form of certificates and publications. There are several institutions such as BRIN, Genetic Engineering Research Center, Bogor Botanical Garden Plant Conservation Center, Isotope and Radiation Application Center, Biology Research Center, and UPT BKTKR Eka Karya Bali. This means that data has not been found that constitutes proposals from agricultural, fisheries research centers, and even the activities of individual companies that register their breeding discoveries.

However, the involvement of breeders in the registration of breeding results needs to be explored further regarding how much they feel about the results of their breeding work. For example, the Agogoanium 12 variety whose certificate is in the hands of BRIN, the Genetic Engineering Research Center also lists its breeders as Enung Sri Mulyaningsih; Sri Indrayani; Yuliana Galih Dyan Anggraheni; Yuli Sulistyowati; Yashanti Berlinda Paradisa; Ambar Yuswi Perdani; Eko Binnaryo Mei Adi; Enung Sri Mulyaningsih M.Sc.; Suwarno; Supartopo. If the Agogoanium 12 variety is commercialized through a licensing agreement, the names mentioned will also be entitled to the economic value obtained from licensing this variety.

There is something that is also overlooked in breeding activities, namely that the current public sector plant breeding has produced many varieties but is not in line with the needs and interests of farmers. The dissemination of a new variety of innovations must not only start from development and research targets. It should pay attention to the adoption capacity of local communities. Market orientation and suitability of farmers' preferences and needs should be the goal of producing new varieties [15]. Mastery of plant breeding technology should also go through research and development steps. Decisions in the process of producing new varieties that are released should have sufficient information about farmers' preferences for that variety.

### ***3.4 Discussion***

The state's position in providing recognition of the legality of ownership of a plant breeding product is a form of public service. The right to protect plant varieties is not an automatic matter but must go through an active application from the breeder. Providing legality has further consequences in maintaining and enforcing the law. The state has indeed provided registration facilities which can be done online. It is also necessary to carry out outreach and campaigns so that breeding activities can move forward as in our neighboring countries. Data that shows there is still a lack of PVP registration outside of the BRIN report must be addressed. As a fulfillment of human rights guaranteed by the 1945 Constitution, the state is obliged to realize the availability, affordability, and fulfillment of sufficient, safe, and quality food.

The state's task of maintaining food stability needs to be prioritized while linking it to food security. What needs further attention, apart from supporting food security, is the ability of breeding activities, especially public sector plant breeding, to currently also be linked to the dissemination of economic rights which can

have an impact on plant breeders. has produced many varieties but not in line with the needs and interests of farmers. The aim of producing new varieties for market orientation, suiting farmers' preferences and needs should be a research and development step.

#### 4. Conclusion

Strengthening the role of the state in providing recognition of the legality of ownership of plant breeding products as a form of public service is a necessity. With an active registration system, the plant variety protection rights need awareness from both parties, namely the government itself in building campaigns and outreach, as well as the breeders themselves, both as individuals and as part of research/R&D institutions, who are encouraged to make active applications from breeders. Providing legality with the consequences of maintaining and enforcing the law will have a good economic impact on breeders. The realization of the availability, affordability, and fulfillment of sufficient, safe, and quality food as well as fulfilling human rights guaranteed by the 1945 Constitution, will guarantee the state's duty to maintain food stability while linking it to food security. Food security with the ability of breeding activities has an impact on plant breeders who produce many varieties.

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