

Legal Protection for Smallholder Farmers in the Trade of Certified Plant Seeds under the Sustainable Agricultural Cultivation System Law

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ABSTRACT: Seed certification is a crucial instrument in ensuring seed quality while protecting producers and consumers in the national agricultural chain, but existing regulations tend to favor large-scale intellectual property rights holders, so smallholders often face administrative barriers, lack of legal literacy, and the risk of criminalization due to the circulation of seeds without official labels. This study aims to analyze the form of legal protection for smallholders in the certified seed trade based on Law Number 22 of 2019 concerning Sustainable Agricultural Cultivation Systems, identify the juridical obstacles faced, and formulate relevant steps to strengthen legal protection. The research uses a qualitative method with a *doctrinal legal research* type through *library research*, using a *statute approach* and a *conceptual approach*, analyzed descriptively-analytically with *content analysis* techniques. The results of the study show that existing legal protections are still partial: preventive protection through certification is more oriented towards strengthening the seed industry, while repressive protection has the potential to criminalize farmers without considering proportionality. Juridical constraints were identified at three stages, namely disharmony of norms between laws, structural-administrative obstacles in the form of high certification costs and a *first-to-file system*, and sociological obstacles in the form of low legal literacy and inequality in farmers' bargaining positions. The research concludes the need for regulatory harmonization, affirmation of the definition of "smallholder", development of a special registration system for smallholder varieties, as well as restorative or decriminalization schemes for minor administrative violations in order to achieve a balance between legal certainty and substantive justice for smallholders.

KEYWORDS: legal protection; smallholders; seed certification; *farmer's privilege*; Legal certainty

I. INTRODUCTION

The agricultural sector is the backbone of national food security, whose sustainability is highly dependent on the availability of quality seeds. As an agrarian country with a large population, Indonesia faces structural challenges in ensuring a sustainable food supply, where seeds are the starting point of the entire agricultural production chain. The quality of the seeds used by farmers will determine productivity, resistance to pests and diseases, and the stability of the overall crop yield. Therefore, one of the instruments to ensure quality is seed certification, which is a prerequisite for the circulation of superior seeds in the market as well as a form of consumer and producer protection. Seed certification does not just function as an administrative formality, but is a quality assurance mechanism that ensures that the seeds in circulation have gone through a series of genetic, physiological, and phytosanitary tests so that they are suitable for cultivation and trade widely.

In the global context, the pressure for the harmonization of intellectual property law in the agricultural sector continues to increase along with Indonesia's participation in various international agreements, both within the framework of the *World Trade Organization* (WTO) and other bilateral and regional trade agreements. This pressure has prompted the government to continue to align domestic regulations with international standards, including in terms of the recognition of exclusive rights to new crop varieties. The adoption of these international standards on the one hand provides an incentive for breeders and seed companies to continue to innovate to produce superior varieties, but on the other hand it has the potential to create structural inequality, because the legal framework built tends to favor large-scale intellectual property rights holders, as can be seen from the study of *compulsory licenses*) which shows that the protection of plant varieties in Indonesia has adopted many international standards without fully accommodating the interests of small-scale farming actors [1]. This general phenomenon shows that seed regulations tend to be oriented towards protecting the rights of breeders and commercial seed business actors rather than cultivators who are the last link in the distribution of certified seeds, even though they are the ones who are directly confronted with market risks, price fluctuations, and regulatory uncertainty in daily practice.

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In particular, in the field, it was found that smallholders often face structural barriers in accessing and trading certified seeds. These obstacles are not only administrative, but also related to limited legal literacy, lack of technical assistance, and high costs that farmers must bear to meet applicable certification standards. The regulation after the issuance of Law Number 22 of 2019 concerning Sustainable Agricultural Cultivation Systems is known to have not fully provided legal certainty for local breeders, while cases of criminalization due to the circulation of seeds without official labels continue to recur [2]. This phenomenon of criminalization is a serious problem, because on the one hand the state encourages farmers to innovate and develop local varieties, but on the other hand legal provisions that require certification and official registration are actually legal snares for farmers who do not understand the formal procedures. This problem is exacerbated by the lack of understanding of lower-middle class farmers regarding registration and certification procedures, so that many locally bred varieties are not registered and are vulnerable to misuse by other parties [3]. This ignorance is not solely the negligence of individual farmers, but also reflects a systemic failure to provide adequate socialization, assistance, and access to legal information for farmer groups in various regions, especially in rural areas far from agricultural administration service centers [4], [5].

On the other hand, a registration system that prioritizes *the principle of first to file* essentially benefits those who have the resources, networks, and administrative capacity to immediately register their varieties, while smallholders who generally work individually or in groups on a limited scale are often left behind in the registration process, as confirmed in a study that compared the regulation of farmers' rights in Indonesia and Malaysia that the liberal registration system actually marginalizes farmers who carry out traditional knowledge-based breeding [6]. As a result, local varieties that are actually the result of hereditary wisdom and knowledge are vulnerable to being claimed or used by other parties who first meet the formal registration requirements.

Literature review shows that there is a significant research gap, because the majority of legal literature on plant seeds focuses more on protecting breeders' rights within the framework of intellectual property, without in-depth exploring the position of smallholders when acting as sellers or buyers of certified seeds in the market [7], [8]. In fact, this aspect of trade has its own legal dimension regarding transaction certainty, consumer protection of farmers, and risk sharing between seed producers, distributors, and farmers as end users. The system and means of marketing agricultural products, including the certainty of farming businesses, are even known to still leave many crucial issues that have not been regulated operationally within the framework of the Law on the Protection and Empowerment of Farmers [9]. These findings further confirm that regulatory gaps at the technical and operational levels can be a real obstacle to the realization of comprehensive legal protection for smallholders, especially in certified seed trading activities which are a basic need for sustainable farming [10], [11].

The novelty of this research lies in the effort to integrate the perspective of legal protection of smallholders not only at the production and breeding stage, but also at the stage of certified seed trading, by placing the Sustainable Agricultural Cultivation System Law as the main analytical framework through a qualitative approach of *library research*. This approach was chosen with the consideration that research that focuses on normative aspects requires an in-depth search of primary and secondary legal materials to identify the gap between the applicable norms and the legal needs in the field, so that the results of this study are expected to provide a comprehensive picture of the form of legal protection that has not been widely explored in the agricultural law literature in Indonesia.

Based on this description, the formulation of this research problem is: first, what is the form of legal protection for smallholders in the trade of certified plant seeds according to the Sustainable Agricultural Cultivation System Law? Second, what are the juridical obstacles faced by smallholders in accessing and trading certified seeds? Third, how are efforts to strengthen legal protection that can be recommended to overcome these obstacles in order to realize legal certainty for smallholders in the trade of certified seeds? In line with the three formulations of the problem, this study aims, first, to analyze the form of legal protection for smallholders in the trade of certified crop seeds based on the Sustainable Agricultural Cultivation System Law; second, to identify the juridical constraints that hinder the effectiveness of such legal protections in seed trading practices at the smallholder level; and third, to formulate measures to strengthen legal protection that can be an input for the improvement of seed regulations that are more in favor of the welfare of smallholders.

This research is expected to provide theoretical benefits in the form of contributions to the development of agricultural law studies, especially regarding the position of smallholders in the certified seed trade chain, as well as practical benefits as recommendation materials for policymakers in improving seed regulations that are more in favor of farmers' welfare. More broadly, this research is also expected to enrich academic treasures in the field of agricultural law and intellectual property law, as well as provide a juridical basis for policy advocacy in favor of smallholder groups as the main actors in the development of the national agricultural sector.

II. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Legal Protection Concept

Legal protection is a fundamental concept in the state of law that places every subject of law, including smallholder farmers, as a party entitled to guarantee his rights and interests from arbitrary actions, both by fellow citizens and by the rulers. Theoretically,

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legal protection can be divided into two forms, namely preventive legal protection that functions to prevent disputes from arising through clear arrangements before a decision or action is implemented, and repressive legal protection that is oriented towards resolving disputes after violations have occurred, as applied in the study of the protection of citizens' rights in the management of national resources for national defense [12]. This framework is relevant to the context of smallholders in the trade of certified seeds, because preventive arrangements in the form of clarity of certification procedures and variety registration are prerequisites to prevent repressive losses or criminalization in the future.

The distinction between preventive and repressive legal protection is basically not just a theoretical categorization, but reflects two different phases in the cycle of legal relations between the state and the legal subjects it protects. Preventive protection emphasizes the function of law as a preventive instrument (*ex ante*), where clarity of norms and procedures is key to closing the space of uncertainty that has the potential to harm structurally weak parties. In contrast, repressive protection works *ex post*, i.e. after a violation or loss has occurred, so its effectiveness is highly dependent on fair and proportionate law enforcement mechanisms. In the context of smallholders, these two forms of protection ideally run in a complementary manner: preventive protection serves to minimize potential disputes through clarity on certification and variety registration requirements, while repressive protection is present as a last safety net if such preventive efforts fail to protect the interests of farmers. However, the inequality of capacity between smallholders and large-scale seed business actors in understanding and complying with applicable legal provisions has the potential to cause these two forms of protection to actually turn around, namely from a protective instrument to an instrument that burdens the party that should be protected.

Legal Certainty Theory

In addition to legal protection, legal certainty is an *important theoretical basis* in assessing the effectiveness of a regulation. Referring to Gustav Radbruch's thought, law ideally embodies three basic values simultaneously, namely justice, utility, and certainty, although the three are often in a stressful relationship (*spannungsverhältnis*) in law enforcement practice. Legal certainty is understood as a guarantee that the law contains clear and consistent rules so that they can be obeyed and applied fairly, as emphasized in a study on online transportation regulations which shows that the unclarity of norms actually causes confusion for business actors in carrying out their economic activities [13]. This principle is relevant to analyze the extent to which the Sustainable Agricultural Cultivation System Law provides legal certainty for smallholders in trading certified seeds, considering that the unclarity of norms can have an impact on the emergence of multiple interpretations that are detrimental to parties in a weak bargaining position.

The tension between Radbruch's three basic legal values—justice, utility, and certainty—becomes even more relevant when applied to regulations governing the relationship between economically and informationally unequal parties, just as smallholders deal with commercial seed businesses. Legal certainty that is interpreted narrowly as the formal consistency of legislative norms risks ignoring the dimension of substantive justice, especially if the textually clear norm can only be fulfilled by parties who have adequate administrative resources. Thus, legal certainty cannot be seen solely as textual clarity, but must also include certainty of access, i.e. the extent to which the applicable norms can truly be reached and fulfilled by all legal subjects, including groups in weak bargaining positions such as small farmers. This principle is an important foothold in assessing whether the SBPB Law has realized legal certainty in its entirety, or whether it is just a formal certainty that has not touched the real needs of farmers in the practice of certified seed trading.

Regulatory Framework for the Protection of Plant Varieties and Smallholders

In the context of agricultural law, the protection of smallholders cannot be separated from the framework of the Plant Variety Protection (PVP) regulation which has adopted many international standards through compulsory *licensing* schemes. Studies on the legal harmonization of mandatory licensing provisions show that PVP regulations in Indonesia tend to be oriented towards the interests of rights holders and commercial seed business actors, while accommodation for the interests of small-scale farmers is still limited [1]. This condition causes structural inequality, because smallholders who carry out breeding based on local wisdom are actually vulnerable to facing administrative obstacles and legal risks when their cultivated seeds are traded without official certification, as revealed in the post-publication study of Law Number 22 of 2019 concerning Sustainable Agricultural Cultivation Systems [2].

The structural inequality in the framework of PVP regulation essentially stems from the difference in philosophical orientation between the modern intellectual property system, which centers on the protection of the exclusive rights of individuals or corporations over formal innovations, and traditional agricultural knowledge systems that are collective, hereditary, and based on the practice of seed exchange between farmers. When such a legal framework oriented towards the protection of exclusive rights is applied without modification to the socio-cultural context of smallholder farmers, practices that are traditionally considered legitimate and prevalent, such as the storage, exchange, or sale of self-breeding seeds, have the potential to transform into actions that violate formal law. This condition underscores the need for a regulatory framework that is able to accommodate the two different

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value systems in a balanced manner, rather than imposing a single legal framework oriented towards the interests of the formal seed industry.

Previous Studies

A number of previous studies have examined legal protection for breeders and plant varieties, but most have focused on the registration and recognition aspects of intellectual property rights. A study on the implementation of legal protection for plant breeders' rights found that the lack of knowledge among lower-middle-class farmers causes many locally bred varieties to not be officially registered, making them vulnerable to abuse by irresponsible parties [3]. Another study comparing the regulation of farmers' rights to plant breeding in Indonesia and Malaysia also confirms that the liberal variety registration system actually marginalizes the contribution of farmers who innovate based on traditional knowledge, while showing that the phenomenon of criminalization of breeders is still recurring due to weak socialization of regulations at the grassroots level [6]. From these studies, it appears that research that specifically highlights the legal protection of smallholders at the stage of certified seed *trade*, rather than just the registration or breeding stage, still leaves a gap that needs to be filled.

Most of the previous studies have a tendency to focus on the upstream phase of the seed life cycle, namely the breeding process and variety registration, without paying equal attention to the downstream phase in the form of seed trade and distribution at the farmer level. In fact, the legal problems faced by smallholders do not stop at the stage of obtaining recognition for the varieties they cultivate, but continue at a much more complex stage, namely when the seeds are to be distributed or sold to other farmers. It is in this phase that the issue of transaction certainty, legal responsibility for seed quality, and the risk of administrative and criminal sanctions becomes more pronounced by farmers. The absence of studies in this phase of trade shows that the academic understanding of the legal protection of smallholders is still incomplete, so research that specifically highlights the dimensions of the certified seed trade is relevant to complement the existing agricultural law study map.

Research Theoretical Framework

Based on the description above, this study builds a theoretical framework that integrates three main pillars, namely legal protection theory as the basis for analyzing preventive and repressive forms of protection for smallholders, legal certainty theory as an instrument to assess the consistency of norms in the Sustainable Agricultural Cultivation System Law, and the regulatory framework for Plant Variety Protection which is a structural context for the position of smallholders in the trade chain certified seeds. These three pillars are used in a complementary manner to analyze the gap between the norms that should apply (*das sollen*) and the reality of their application in the field (*das sein*), so that this research is expected to be able to make a theoretical and practical contribution to strengthening the legal protection of smallholders in the trade of certified plant seeds.

III. METHODOLOGY

This research uses a qualitative approach with a type of normative legal research or commonly called *doctrinal legal research*, which is research that focuses on tracing written legal norms, legal principles, and doctrines that are relevant to the object of study, without involving the collection of field data. Normative legal research is essentially an effort to examine law as a coherent system of norms through deductive reasoning on secondary legal materials, so that the validity of the resulting juridical arguments is highly dependent on the sharpness of the analysis of the laws and regulations and legal literature used [14]. In line with this, data collection techniques are carried out through library *research*, which is the systematic tracing and study of primary, secondary, and tertiary legal materials from accountable sources, without involving interviews or field observations.

The approaches used in this study include a statutory *approach* and a *conceptual approach*. The legislative approach is applied to examine the provisions in Law Number 22 of 2019 concerning Sustainable Agricultural Cultivation Systems and implementing regulations related to the trade in certified seeds and the protection of smallholders, while the conceptual approach is used to analyze relevant legal concepts, such as *farmer's privilege*, certainty of farming businesses, and legal certainty in the agricultural trade chain. The primary legal materials used include related laws and regulations, while secondary legal materials are obtained from books, accredited scientific journals, previous research results, and official documents of state institutions relevant to the research topic.

In normative legal research, secondary legal materials are placed as the main source of data that is analyzed qualitatively to find consistency and gaps between the applicable norms and the legal needs of the community, so that this method is considered appropriate to reveal the problem of *das sollen* (norms that should apply) and *das sein* (the reality of the application of norms) in the practice of certified seed trading by smallholders [15]. Data analysis is carried out in a descriptive-analytical manner through *content analysis* techniques, namely by identifying, classifying, and interpreting the legal materials that have been collected to then draw conclusions systematically. All collected legal materials are then cross-verified to ensure their accuracy and relevance to the formulation of the research problem, before being compiled into a coherent and comprehensive juridical argument in answering the issue of legal protection for smallholders in the trade of certified plant seeds.

IV. RESULT AND DISCUSSION

Forms of Legal Protection for Smallholders in the Trade of Certified Crop Seeds According to the Sustainable Agricultural Cultivation System Act

This section answers the formulation of the first problem regarding the form of legal protection provided to smallholders in the trade in certified plant seeds under the Sustainable Agricultural Cultivation System Law (SBPB Law). The analysis is carried out by dividing the form of protection into three dimensions, namely preventive protection, repressive protection, and its conformity with the principle of legal certainty.

Preventive Legal Protection in Seed Regulation

Preventive legal protection in the SBPB Law is reflected in the provisions regarding seed certification as an instrument to prevent disputes before seeds are circulated in the market. The provisions on seeds and seedlings in this law are basically designed to ensure that every seed traded meets certain quality standards, so that it can theoretically protect farmers as buyers from the risk of counterfeit or low-quality seeds. However, the clarity of the variety registration procedure and the recognition of *farmer's privilege* in practice still leaves problems, especially for farmers who play a dual role as breeders as well as sellers of their own cultivated seeds. The experience of rice farmers in Java who learned to become breeders through *the Farmer Field Schools for Participatory Plant Breeding* shows that the existing seed and intellectual property legal framework is more oriented towards strengthening the seed industry and compliance with development plans, so that a number of farmers are actually criminally prosecuted for their seed experiment activities, even though subsequent legislative changes have restored some of the rights of farmers although accompanied by new reporting requirements and restrictions [16]. These findings confirm that preventive protection, which should ideally be built through clarity of norms, has not been fully realized in practice, so that the space for farmers to conduct experiments and seed innovations remains overshadowed by legal uncertainty.

The role of the government and local governments in providing information, counseling, and assistance is another crucial element of this preventive protection. The SBPB Law normatively mandates the implementation of agricultural extension as part of coaching farmers, but its effectiveness is highly dependent on the availability of human resources and budgets at the regional level. Without adequate assistance, preventive provisions in the form of certification obligations can actually turn into a disproportionate administrative burden for smallholders, instead of being an instrument of protection that prevents their losses in the future.

Repressive Legal Protection in Seed Trade Dispute Resolution

The second dimension of legal protection in the SBPB Law is repressive protection, which is oriented towards dispute resolution and enforcement of sanctions after violations occur, including administrative and criminal sanctions related to the circulation of seeds without official certification. This repressive provision is basically intended to maintain order in the seed market and protect consumers from seeds that do not meet quality standards. However, the application of criminal provisions against farmers who trade their own seeds without going through a formal certification process raises serious proportionality issues. A study of the criminal aspects of the Plant Variety Protection regime in Indonesia shows that almost 90% of maize crops are cultivated through the traditional knowledge of farmers, while the increased dependence on the seed industry actually disrupts agricultural practices that have been passed down through generations, so that the criminal provisions in the Plant Variety Protection Law are considered to inadvertently encourage monopolization of the seed industry and discriminate against farmers [17]. This finding is relevant for assessing similar repressive provisions in the SBPB Law, because the same approach—namely the enforcement of sanctions without considering the socio-economic context of smallholders—has the potential to cause substantive injustice even though it is formally in accordance with the law.

Therefore, strengthening the space for non-litigation dispute resolution, such as mediation and facilitation by local governments, is an alternative that is more in favor of farmers than a purely criminal repressive approach. This non-litigation mechanism allows for the resolution of administrative issues, such as delays in registration or incompleteness of certification documents, without having to bring farmers into the criminal realm which has a much greater impact on the sustainability of their farming business.

Conformity of the Norms of the SBPB Law with the Principle of Legal Certainty

The third dimension highlights the consistency between the provisions of the SBPB Law and implementing regulations, such as Government Regulations and Regulations of the Minister of Agriculture, in regulating seed certification and trading. This normative consistency is important to avoid multiple interpretations that can harm small farmers as parties with weak bargaining positions. A study on the legal protection of farmers' rights to the use of genetic resources of food crops found that although Indonesia has a strategic position as the main provider of genetic resources for food and agricultural crops, the government has not provided adequate recognition and legal protection for *Farmers' Rights*, while amendments to the Patent Law and the Plant Variety Protection Law are considered to be less accommodating to the interests of farmers because does not provide substantive clarity regarding these rights [18]. These findings show a gap between *das sollen*—an ideal norm that should substantively protect farmers—and *das sein*, i.e. the fact that existing regulations are still oriented towards compliance with international commitments rather than the protection of national interests and the rights of smallholders.

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Synchronization between the SBPB Law and the Law on the Protection and Empowerment of Farmers is also key to ensuring that the certainty of farming, including in the aspect of certified seed trade, is not only partially regulated in one law, but integrated in a coherent national agricultural policy framework.

Table 1. Forms of Legal Protection for Small Farmers in the SBPB Law

Protection Dimensions	Form of Regulation in the SBPB Law	Related Study Findings
Preventive	Seed certification, variety registration, agricultural extension	The legal framework for seeds is still oriented towards strengthening the seed industry rather than protecting farmers and breeders [16]
Repressive	Administrative and criminal sanctions for the circulation of seeds without certification	Criminal provisions have the potential to discriminate against farmers and encourage monopolization of the seed industry [17]
Legal Certainty	Consistency of the SBPB Law with implementing regulations and other related laws	PVP regulations have not provided substantive clarity on <i>Farmers' Rights</i> [18]

Source: processed by the author from Antons et al. (2020) [16] ; Suastuti et al. (2023) [17]; Yuliati (2025) [18].

Juridical Obstacles Faced by Smallholders in Accessing and Trading Certified Seeds

This section answers the formulation of the second problem by identifying the juridical constraints faced by smallholder farmers, which are grouped into three stages, namely constraints at the norm level, structural-administrative constraints, and sociological constraints including the risk of criminalization.

Constraints at the Norm Level (Disharmony and Regulatory Ambiguity)

The first obstacle identified is the overlap of arrangements between the SBPB Law, the Plant Variety Protection Law, and the Farmer Protection and Empowerment Law. The three laws both address the aspect of farmer protection, but with different approaches and emphasises, thus creating ambiguity about which law is the main reference in the concrete case of the certified seed trade. The vagueness of the definition of "smallholder" also exacerbates this problem, as the scope of legal protection depends largely on how the category is defined operationally. The study on the empowerment of farmers' rights as cultivators of local varieties shows that Law Number 29 of 2000 concerning the Protection of Plant Varieties is still ambiguous and does not support the sustainability of locally-based agriculture, as reflected in the case of Tukirin farmers in Nganjuk who faced legal problems due to the unclarity of the regulation, so that a more inclusive and fair reformulation of regulations is considered very necessary to strengthen the rights of farmers and preventing market dominance by large corporations [19]. The lack of clarity in the technical mechanism for certification for locally bred seeds further strengthens the argument that the problem is not only in the substance of the norm, but also in the absence of operational technical guidelines for farmers in the field.

Structural and Administrative Constraints in Implementation

The second obstacle is structural and administrative, namely the high cost and complexity of the certification procedure that is disproportionate to the economic capacity of smallholders. The technical requirements related to *distinctness, uniformity, and stability* that are commonly imposed in formal variety registration systems are often irrelevant to the characteristics of farmers' varieties, so many farmer varieties are trapped in the informal realm as "potential planting materials" whose production, use, exchange, and trade remain unregulated, poorly supported, and often undervalued. This problem is further exacerbated by the fact that a relatively new set of seed law rules has become a new mechanism of *accumulation by dispossession* in the agricultural sector, where certification requirements and quality standards are used to prohibit practices that are actually necessary for the functioning of informal seed systems, thus accelerating the erosion of seed sovereignty and posing an additional threat to impactful agricultural biodiversity directly to the livelihood of farmers (Wattnem, 2016). The lack of companion institutions or extension agencies at the village level has widened this gap, as farmers do not have adequate access to technical assistance in meeting these complex administrative requirements.

The registration system that prioritizes *the principle of first to file* also structurally benefits large-scale seed business actors who have more adequate institutional capacity. Studies on the use of regulatory flexibility to address market informality in seed systems show that seed rules and regulations determine who can produce and sell seeds, what varieties are available in the market, the quality of seeds traded, and where seeds can be bought and sold, so that the seed legal and regulatory environment affects all stakeholders, including those in the informal sector. through the formation of who can participate in the market as well as the quality and diversity of available seeds [20]. The study confirms that a rigid regulatory approach, without considering flexibility for small-scale actors, actually hinders the integration between formal and informal seed systems that can actually complement each other.

Sociological Constraints and Risks of Criminalization

The third obstacle is sociological, namely the low legal literacy of farmers regarding certification obligations and criminal risks for the circulation of seeds without official labels. This condition is exacerbated by the weak capacity of supporting institutions at the local level in assisting farmers to improve the quality and competitiveness of their agricultural products. A study on nutmeg farmer empowerment strategies in Fakfak Regency shows that although the area is the largest nutmeg producer in West Papua, the high quantity of production is not directly proportional to the quality of the results achieved, so that the selling value of nutmeg from the region becomes low in the market and makes it difficult for farmers to achieve welfare, which in turn demands the active role of the relevant agencies in mentoring and marketing [21]. This illustration shows that the sociological constraints of smallholder farmers are not solely legal, but also intertwined with broader issues of economic and institutional capacity.

The inequality of smallholder bargaining positions against distributors and seed companies in the trade chain also strengthens their vulnerability. A policy study on seed systems for vegetatively propagated crops in Vietnam found that despite a regulatory regime that imposes strict rules on the production and trade of planting materials, the market in practice remains largely unregulated due to weak enforcement capacity, so producers and traders of planting materials rely on trust, reputation, and long-term relationships to provide quality signals to farmers [22]. These findings are relevant to the Indonesian context, as they show that in weak conditions of formal law enforcement, trust-based informal relationships are the main mechanism that determines the bargaining position of smallholders, which in turn makes them vulnerable to exploitation and legal risks when the transaction intersects with formal provisions on seed certification.

Table 2. Juridical Constraints of Smallholders in the Trade of Certified Seeds

Constraint Levels	Forms of Constraints	Related Study Findings
Norm	Overlapping regulations, vague definition of smallholders, and unclear mechanism for certification of local varieties	The PVP Law is ambiguous and does not support the sustainability of local agriculture [19]
Structural/Administrative	The cost and complexity of certification is high, minimal mentoring, and the <i>first-to-file</i> system is detrimental to smallholder farmers	Certification is used to prohibit the practice of informal seed systems that are vital for farmers [23]; rigid regulation inhibits the integration of formal-informal seed systems [20]
Sociologists	Low legal literacy, inequality of bargaining position, risk of criminalization	Low production quality due to lack of assistance makes it difficult for farmers' welfare [21]; Informal seed markets rely on trust due to weak law enforcement [22]

Source: processed by the authors from Anggraini et al. (2025) [19]; Wattnem (2016) [23]; K. Kuhlmann & Dey (2021)[20]; Naisin & Asyik (2022) [21]; Gatto et al. (2021) [22].

Efforts to Strengthen Legal Protection for Small Farmers in the Trade of Certified Seeds

This section answers the formulation of the third problem by formulating efforts to strengthen legal protection which includes strengthening legal norms, strengthening institutional and certification governance, and strengthening protection based on legal certainty and social justice.

Legal Reform

The first strengthening concerns the harmonization between the SBPB Law, the Plant Variety Protection Law, and the Farmer Protection and Empowerment Law, so that there is no overlap of norms that confuse farmers and law enforcement officials. The affirmation of the definition and criteria of "smallholder" is also an urgent need so that the scope of farmer's *privilege protection* can be expanded consistently across all agriculture-related laws and regulations. In the international context, the concept of *Farmers' Rights* regulated in the *International Treaty on Plant Genetic Resources for Food and Agriculture* is still fundamentally a weak legal concept, because it only provides limited recognition compared to competing interests under a stronger legal regime, thus the realization of *Farmers' Rights* in a country is highly dependent on interaction and mutual understanding with other international legal regimes, including the *UN Declaration on the Rights of Peasants and Other People Working in Rural Areas* (UNDROP) which places these rights in the context of human rights even though they are not legally binding instruments [24]. These findings provide an important lesson for Indonesia that strengthening domestic norms on smallholder rights needs to be strengthened through reference to progressive international legal instruments, as well as through consistent policy advocacy at the national level.

Crop Variety Protection regulation reform also needs to pay more attention to the dimension of distributive justice in depth. A study that analyzed the impact of agricultural sector capitalization on farmers' rights and local seed systems from an Islamic socio-legal perspective found that the implementation of the Crop Variety Protection regime remains dominated by corporations and

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formal research institutions, while smallholders face structural barriers in accessing legal protection, so that the concentration of control over seeds raises issues of distributive justice, public welfare (*maṣlahah*), and monopolistic practices (*ihtikār*), which in turn demand substantial reforms through a more inclusive legal framework in recognizing farmers' rights, protecting local seed systems, and balancing innovation incentives with social justice and collective well-being [25]. This perspective enriches the argument that it is not enough to strengthen legal norms only technical-administrative, but must also be based on the value of substantive justice that is rooted in the social and cultural context of the peasant community.

Strengthening Institutional and Certification Governance

The second strengthening focuses on simplifying procedures and certification costs for seeds from farmers or farmer groups, along with strengthening the role of agricultural extension workers and legal assistance institutions at the village and sub-district levels. One concrete step that can be adopted is the development of a special registration system for farmer varieties that recognizes the inherent characteristics of the variety, which are often different from varieties developed by the formal seed sector. The guide on the development of a registration system for farmer varieties shows that by following the chain of seed regulation values that are commonly passed by new crop varieties to reach the market, an approach can be formulated to solve the key issues of what is meant by farmer varieties to what rights registrants can obtain over the registered varieties vis-à-vis other stakeholders, so that through the registration and dissemination of farmer varieties, governments can contribute to increasing agricultural biodiversity at the farm level that strengthens farmers' resilience and livelihoods, while supporting the implementation of *Farmers' Rights* as defined in relevant international agreements [26]. The adoption of this kind of framework in Indonesia could be a concrete solution to bridge the gap between the rigid formal certification system and the real needs of smallholders in recognising and trading their breeding varieties.

The integration of agricultural information systems is also an important element in strengthening this institution, in order to facilitate farmers' access to market data, certification procedures, and information about varieties that have been registered and are still in the registration process. The availability of an integrated information system can reduce information inequality which has been one of the sources of vulnerability of smallholders in interacting with large-scale seed business actors and government institutions.

Strengthening Protection Based on Legal Certainty and Social Justice

The third reinforcement emphasizes the importance of a balance between legal certainty as proposed by Radbruch and substantive justice for smallholder farmers. This effort can be realized through restorative or decriminalization schemes for minor administrative violations related to seed circulation, so that farmers are not necessarily faced with criminal sanctions for administrative negligence that can actually be resolved through coaching mechanisms. In addition, affirmative policies specifically designed to strengthen smallholders' bargaining positions in certified seed trade chains need to be considered as part of national agricultural policy reforms. Lessons from other regions show that seed policies that are not adjusted to the characteristics of commodities and the scale of farmers' businesses actually hinder the development of the sector. A study of vegetable seed regulation in Africa found that farmers in sub-Saharan Africa do not have many choices of quality vegetable seeds that are suitable for local growing conditions or consumer demand, while government-centric regulatory approaches without considering limited institutional capacity are not appropriate for horticultural commodities, so seed policies, laws, and regulations are designed to be more specific to commodity characteristics can encourage the development of local varieties and seed production and provide benefits to smallholders and consumers at large [27]. This lesson is relevant to be replicated in the Indonesian context, where affirmative policies tailored to the characteristics of commodities and the scale of smallholder businesses have the potential to be a more effective instrument than a uniform regulatory approach for all types of seeds.

Table 3. Recommendations for Strengthening Legal Protection for Small Farmers

Forms of Reinforcement	Concrete Recommendations	Related Study Foundations
Legal Norms	Harmonization of the SBPB Law, the Pvt Law, and the Farmer Protection and Empowerment Law; affirmation of the definition of smallholder; References to International Farmers' Rights Instruments	<i>Farmers' Rights</i> require interaction with other international legal regimes to gain adequate legal space (Prip, 2024); PVP reform needs to be based on distributive justice and collective welfare (Laurency et al., 2026)
Institutions and Governance	Simplification of certification procedures, strengthening extension workers, special registration system for farmers' varieties, integration of agricultural information systems	Farmer variety registration system can increase biodiversity and support the implementation of <i>Farmers' Rights</i> (De Jonge et al., 2025)

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Legal Certainty and Social Justice	Restorative/decriminalization scheme for minor administrative offenses; affirmative policy according to commodity characteristics	Regulations tailored to commodity characteristics encourage the development of local seeds and benefit smallholders (K. A. Kuhlmann et al., 2023)
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Source: processed by the author from Prip (2024) [24]; Laurency et al. (2026) [25]; De Jonge et al. (2025) [26]; K. A. Kuhlmann et al. (2023) [27].

Overall, the results of the analysis in the three subchapters above show that legal protection for smallholders in the trade of certified plant seeds under the SBPB Law is still partial, with a real gap between preventive-repressive norms and their implementation in the field. The identified juridical constraints originate from three interrelated levels, namely disharmony of norms, structural-administrative barriers, and sociological vulnerabilities that lead to the risk of criminalization. The recommended strengthening efforts are also multidimensional, including legislative reform, institutional strengthening, and affirmative policies based on a balance between legal certainty and substantive justice for smallholders as the main actors in the certified seed trade chain.

V. CONCLUSIONS

Based on the results and discussions that have been described, it can be concluded that legal protection for smallholders in the trade of certified crop seeds according to the Sustainable Agricultural Cultivation System Law is still partial and has not fully sided with the substantive interests of farmers. Preventive protection in the form of certification and registration of varieties is in practice more oriented towards strengthening the seed industry, while repressive protection through administrative and criminal sanctions has the potential to criminalize farmers who trade their own seeds without adequate proportionality considerations. The gap between *das sollen* and *das sein* also shows that the ideal norms in the law are not in harmony with the reality of their application in the field. The juridical obstacles faced by smallholders stem from three interrelated levels, namely disharmony and regulatory ambiguity between the SBPB Law, the Plant Variety Protection Law, and the Farmer Protection and Empowerment Law; structural-administrative obstacles in the form of high certification costs, lack of assistance, and a first-to-file registration system that structurally harms smallholders; and sociological obstacles in the form of low legal literacy and inequality in bargaining positions for large-scale seed business actors. These three levels of obstacles cumulatively hinder the realization of fair legal certainty for smallholders in carrying out certified seed trading activities.

Based on these conclusions, this study recommends several strategic steps. First, it is necessary to harmonize regulations between the SBPB Law and other related laws, accompanied by an affirmation of the definition and criteria of "smallholders" so that the scope of legal protection becomes clearer and more consistent. Second, the government needs to develop a special registration system for farmer varieties that is more flexible than the formal certification system, accompanied by simplifying procedures and costs, strengthening the role of agricultural extension workers, and integrating information systems that facilitate farmers' access to market data and regulations. Third, it is necessary to implement restorative or decriminalization schemes for minor administrative violations, as well as the formulation of affirmative policies that are tailored to the characteristics of commodities and the scale of smallholder businesses, in order to realize a balance between legal certainty and substantive justice. Further research is suggested to complement this normative study with an empirical approach in the field, so that the resulting policy recommendations can be more comprehensive and applicable to strengthening the legal protection of smallholders in Indonesia.

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