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Reconstructing Indonesia's Agricultural Intellectual Property Rights Regime for Justice and Sustainability

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ABSTRACT

Indonesia's agricultural intellectual property rights (IPR) regime plays a strategic role in promoting agricultural innovation and economic development; however, concerns remain regarding the unequal distribution of legal protection, opportunities, and benefits between plant breeders and farmers. This study examines the construction of Indonesia's agricultural IPR regime, identifies its distributive justice issues, and reconstructs the regime using John Rawls's theory of justice as fairness and the Agricultural Innovation System (AIS) approach. The study employs normative legal research with legal, conceptual, philosophical, comparative, and interpretive approaches. The findings indicate that the current regime provides strong protection for breeders' rights through exclusive rights, licensing, certification, and enforcement mechanisms. In contrast, farmers' rights remain limited and largely positioned as exceptions rather than independent rights. The study further finds structural inequalities in access to legal protection, corporate dominance in innovation governance, weak benefit-sharing mechanisms, and limited recognition of community-based innovation. Consequently, the regime supports innovation incentives, investment, and seed industry development, but has not fully achieved distributive justice, inclusive economic development, or sustainable agricultural development. This study is limited by its normative scope and does not empirically assess the socioeconomic impacts of the regime. The findings suggest the need for legal reforms that strengthen farmers' rights, expand inclusive access mechanisms, institutionalise equitable benefit sharing, and integrate AIS-based governance. The study's originality lies in integrating Rawlsian distributive justice with AIS to formulate a model for reconstructing agricultural IPR that balances innovation protection, social justice, and sustainability.

Keywords: *Intellectual Property Right Regime, Agricultural Intellectual Property Rights, Plant Variety Protection, Farmers' Rights, Sustainable Agricultural Development.*

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I. INTRODUCTION

The agricultural Intellectual Property Rights (IPR) regime is a crucial instrument for promoting innovation, productivity, and competitiveness in the seed industry, as well as sustainable economic and agricultural development. From a modern perspective, the protection of agricultural innovation is no longer understood simply as granting exclusive rights to breeders, but as part of Agricultural Innovation Systems (AIS) that support economic growth, food security, technology transfer, and the sustainability of agricultural resources (de Boon et al., 2022; Rose et al., 2021; Yin et al., 2022). Therefore, various countries are striving to balance innovation protection, economic interests, and social benefits through agricultural IPR regimes.

At the global level, the development of agricultural IPR regimes is influenced by various international instruments such as the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), the UPOV-influenced plant variety protection system, the Convention on Biological Diversity (CBD), and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) (Antons, 2024; Antons & Babu, 2023). Although aimed at protecting innovation and regulating access to genetic resources, various studies show that the benefits of these protections tend to benefit seed companies, research institutions, and formal breeders more than smallholder farmers who contribute to germplasm conservation and local variety development (Antons et al., 2020; Ghimire et al., 2021).

In Indonesia, the protection of agricultural innovation is realised through Law Number 29 of 2000 concerning Plant Variety Protection (PVT). This system grants exclusive rights to breeders who produce new varieties that meet BUSS (New, Unique, Uniform, and Stable) requirements through a registration and substantive testing mechanism (Gracella et al., 2020). Normatively, this system

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is designed to encourage research and development, strengthen the national seed industry, and increase agricultural productivity (Antons & Babu, 2023).

However, the benefits of this protection have not been distributed evenly. Data from the Indonesian Biotechnology and Biotechnology Association (PPVTPP) shows that PVP rights are dominated by domestic companies (60.85%) and government agencies (20.64%), while individual breeders only hold around 6.81% of the rights (Arafahan et al., 2026). This situation suggests that actors with financial resources, technical capacity, and research infrastructure have easier access to legal protection than local breeders (Mayasari & Alimuddin, 2020). Furthermore, Indonesia still faces economic losses due to biopiracy practices, estimated at USD 2–3 billion per year (Arafahan et al., 2026; Rahmah et al., 2020).

This issue is further complicated by the fact that agricultural intellectual property rights (IPR) also relate to farmers' rights to save, reuse, exchange, and develop seeds as part of traditional agricultural practices (Ghimire et al., 2021). The dominance of breeders' rights has the potential to limit farmers' rights, creating tensions between innovation protection, food sovereignty, the sustainability of local seed systems, and inclusive agricultural development (Shabir, 2020; Suastuti et al., 2023). In this study, breeders are understood as individuals or legal entities that carry out formal breeding, while farmers refer to smallholder farmers and local breeders who develop varieties through community-based practices (Antons & Babu, 2023; Ghimire et al., 2021).

The main problem with Indonesia's agricultural intellectual property rights regime lies not in the lack of legal protection, but rather in the unequal distribution of rights, economic benefits, and access to legal protection between formal breeders and local farmer breeders. The complex requirements of the Commercially-Supported Plant Protection System (BUSS), the costs of testing

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and certification, and administrative procedures make the protection system more accessible to seed companies and research institutions than to smallholder farmers (Ghimire et al., 2021; Gracella et al., 2020). Furthermore, the existing legal framework does not fully recognise farmers' collective contributions to the conservation of genetic resources and the development of local varieties, which are the foundation of national agricultural innovation (Ghimire et al., 2021; Maileni, 2014).

This research is important because agricultural IPR issues relate not only to the protection of intellectual property rights but also to the sustainability of agricultural innovation systems, rural economic development, food security, and social justice (Rose et al., 2021; Yin et al., 2022). The AIS literature demonstrates that sustainable agricultural innovation must result in a fair distribution of benefits among all innovation actors (de Boon et al., 2022; Gutiérrez Cano et al., 2023). Furthermore, global harmonisation of the IPR regime requires Indonesia to ensure that legal reforms not only fulfill international obligations but also support inclusive national development. To date, studies in Indonesia have been dominated by discussions of breeders' rights, farmers' rights, or the administrative aspects of PVP. At the same time, evaluations based on distributive justice theory are still very limited.

Plant variety protection in Indonesia is established through various legal instruments, including Law Number 29 of 2000 concerning PVP (Undang-Undang Nomor 29 Tahun 2000 Tentang Perlindungan Varietas Tanaman, 2000), Government Regulation Number 13 of 2004, Government Regulation Number 14 of 2004, and various amendments following Law Number 6 of 2023 concerning Job Creation (Pratiwi et al., 2021). Internationally, Indonesia is also bound by TRIPS obligations, which require an effective plant variety protection system (Antons & Babu, 2023; Nurani et al., 2025).

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Legal complexity arises because the regime reconciles various, often conflicting interests, namely the protection of breeders' exclusive rights, farmers' rights to seeds, genetic resource conservation, seed industry interests, and national food security (Ghimire et al., 2021; Maileni, 2014). In this context, John Rawls's theory of distributive justice is relevant to evaluate whether the distribution of rights, economic benefits, and access to legal protection in the PVP system has benefited the most disadvantaged groups. This approach is also in line with Article 28C paragraph (1) and Article 33 of the 1945 Constitution of the Republic of Indonesia, which emphasises the use of science for the prosperity of the people.

Previous research has shown a diverse focus on Indonesian agricultural intellectual property rights. Purwanto et al. (2024) emphasised the role of PVP certification in protecting the economic rights of breeders. Suastuti et al. (2023) demonstrated the potential for criminalisation of farmers due to criminal provisions in the PVP Law. Antons et al. (2020) and Ghimire et al. (2021) revealed the dominant influence of TRIPS and UPOV, which prioritise the interests of breeders over farmers. Shabir (2020) criticised the political orientation of PVP law, which focuses more on economic interests than social justice. Rahmah et al. (2020) discussed the protection of genetic resources and the threat of Biopiracy, while Hafsyah and Ristawati (2020) linked agricultural technology to the right to food and food sovereignty. Meanwhile, Imani et al. (2025) demonstrated the relevance of Rawls' theory in the equitable distribution of agricultural resources.

Beyond IPR studies, the literature on Agricultural Innovation Systems emphasises the importance of inclusive distribution of innovation benefits, multi-stakeholder participation, and strengthening the capacity of local actors

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in realising sustainable agricultural development (de Boon et al., 2022; Gutiérrez Cano et al., 2023; Rose et al., 2021; Yin et al., 2022).

Although there has been much research on breeders' rights, farmers' rights, Biopiracy, and the influence of international regimes on Indonesia's PVP system, there has been no research that specifically reconstructs Indonesia's agricultural IPR regime through John Rawls' theory of distributive justice by integrating the issues of innovation protection, distribution of economic benefits, sustainable economic development, and sustainable agricultural development in one complete analytical framework.

The novelty of this research lies in the integration of John Rawls's theory of distributive justice with the agricultural IPR regime and the concepts of economic development and sustainable agriculture. This research not only evaluates the legality of the PVP system but also examines whether the distribution of rights, economic benefits, and access to legal protection generated by the agricultural IPR regime supports equitable, inclusive, and sustainable development.

This study aims to analyse the suitability of the Indonesian agricultural IPR regime with John Rawls' principles of distributive justice, identify normative weaknesses that cause unequal distribution of benefits between breeders and farmers, and formulate a legal reconstruction model that supports sustainable economic and agricultural development.

This article argues that Indonesia's agricultural intellectual property rights regime still exhibits distributive inequality, prioritising the protection of the economic rights of formal breeders over the distribution of benefits received by farmers, the most vulnerable group in the agricultural innovation system. This situation is not fully aligned with Rawls's principle of distributive justice and has the potential to hinder the realisation of sustainable economic and

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agricultural development. Therefore, a reconstruction of the agricultural intellectual property rights regime is needed that integrates innovation protection with strengthening farmers' rights, equitable benefit sharing, and expanding access to legal protection.

Theoretically, this research expands the study of the relationship between agricultural IPR, distributive justice, and sustainable development. Practically, this research offers a legal reconstruction model that can be used as a basis for reforming Indonesia's agricultural IPR regime to support better inclusive innovation, sustainable economic growth, and equitable agricultural development. This research also contributes to the achievement of SDG 2 (Zero Hunger), SDG 8 (Decent Work and Economic Growth), SDG 10 (Reduced Inequalities), SDG 12 (Responsible Consumption and Production), and SDG 16 (Peace, Justice, and Strong Institutions).

II. RESEARCH METHODS

This research uses a normative (doctrinal) legal research method that focuses on the analysis of legal norms, legal principles, doctrines, and regulations governing the agricultural Intellectual Property Rights (IPR) regime in Indonesia, particularly Plant Variety Protection (PVT). This approach was chosen because the research is not directed at testing empirical behavior or policy implementation, but rather at evaluating normative coherence, legal legitimacy, regulatory construction, and distributive implications arising from the legal relationships between breeders, farmers, and other actors in the agricultural innovation system. Normative legal research allows for the identification of regulatory weaknesses, assessment of the fairness of the distribution of rights and benefits, and the formulation of prescriptive

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recommendations for the reconstruction of a more just and sustainable agricultural IPR regime (Ballin, 2020; Hutchinson & Duncan, 2012).

This research employs three main approaches. First, a statute approach analyses the structure and substance of various regulations governing plant variety protection, seed systems, and agricultural innovation. This approach is used to identify consistencies, gaps, and normative tensions within the applicable legal framework (Marzuki, 2017). Second, a conceptual approach examines key concepts such as intellectual property rights, breeders' rights, farmers' rights, equitable benefit sharing, food sovereignty, Agricultural Innovation Systems (AIS), sustainable agricultural development, sustainable economic development, and distributive justice (Taekema, 2021). Third, a philosophical approach is used because this research utilises John Rawls's theory of distributive justice as the primary normative framework for assessing the legitimacy of the distribution of rights, opportunities, benefits, and legal burdens within the Indonesian agricultural IPR regime (Freeman, 2007; Rawls, 2017).

Primary legal materials include the 1945 Constitution of the Republic of Indonesia, specifically Article 28C paragraph (1) and Article 28C and Article 33; Law Number 29 of 2000 concerning Protection of Plant Varieties; Law Number 6 of 2023 concerning Job Creation; Government Regulation Number 13 of 2004 concerning Naming, Registration, and Use of Original Varieties for the Creation of Essential Derivative Varieties; Government Regulation Number 14 of 2004 concerning Transfer of Plant Variety Protection Rights and Use of Varieties Protected by the Government; Regulation of the Minister of Agriculture Number 38 of 2019 concerning Release of Plant Varieties; Regulation of the Minister of Agriculture Number 12 of 2021 concerning Production, Certification, and Distribution of Seeds; Regulation of the Minister

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of Agriculture Number 15 of 2021 concerning Standards for Business Activities and Products in the Implementation of Risk-Based Business Licensing in the Agricultural Sector; Regulation of the Minister of Agriculture Number 29 of 2021 concerning Implementation of Business Licensing and Administrative Services in the Agricultural Sector; as well as technical guidelines issued by PPVTPP regarding BUSS testing, substantive examination, procedures for applying for PVT rights, and management of Essential Derived Varieties. Furthermore, the study also utilised relevant international legal instruments, namely the TRIPS Agreement, the Convention on Biological Diversity (CBD), and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), as primary legal sources for the comparative analysis. These sources were selected because they are legally binding and serve as the primary normative basis for assessing Indonesia's agricultural intellectual property regime.

Secondary legal materials consist of Scopus-indexed international journal articles, accredited national law journals, scientific books, and previous research on plant variety protection, breeders' rights, farmers' rights, Biopiracy, benefit sharing, agricultural innovation systems, and sustainable development. Particular attention is paid to literature discussing AIS and agricultural innovation governance as they are relevant to explaining the relationship between legal protection, innovation, productivity, and long-term economic sustainability (Antons et al., 2020; de Boon et al., 2022; Ghimire et al., 2021; Gutiérrez Cano et al., 2023; Rose et al., 2021). Tertiary legal materials include legal dictionaries, legal encyclopedias, regulatory indexes, and national and international legal databases (Hutchinson & Duncan, 2012).

The legal materials were collected through literature review, documentation study, and legal document analysis. The literature review was

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used to obtain relevant academic literature. In contrast, the documentation study was used to inventory laws and regulations, policy documents, international agreements, and institutional reports related to plant variety protection and agricultural innovation governance. The legal document analysis was then used to identify the normative structure, regulatory objectives, legal relationships, and distributive consequences that arise within the agricultural IPR regime (Hall & Wright, 2008; Hutchinson & Duncan, 2012).

The analysis is conducted in three stages. First, a systematic legal analysis is used to establish and evaluate the normative relationship between the constitution, laws, and implementing regulations governing agricultural intellectual property rights. Second, legal argumentation is used to assess the legitimacy and coherence of norms through a distributive justice perspective. Third, deductive reasoning is used to conclude general legal principles from specific provisions within the PVP regime. The analysis also utilises inductive reasoning to identify recurring patterns of distributive inequality in the literature and analogical reasoning to compare the PVP regime with other legal regimes governing public resources, innovation governance, and benefit sharing (Ballin, 2020).

Legal interpretation is conducted through four methods. Grammatical interpretation is used to understand the textual meaning of legal provisions; systematic interpretation is used to place norms within the framework of constitutional law, agricultural law, and intellectual property law; teleological interpretation is used to assess the compatibility of the objectives of plant variety protection with social justice, farmer protection, innovation, and sustainable development; and comparative interpretation is used to compare the Indonesian regime with international frameworks such as TRIPS, CBD, ITPGRFA, and UPOV (McLeod, 2020).

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The theoretical framework of this study integrates John Rawls' theory of distributive justice and the AIS perspective. The Equal Liberty Principle is used to assess the recognition of innovation rights for breeders and farmers; the Fair Equality of Opportunity Principle is used to evaluate equality of access to legal protection and innovation opportunities; and the Difference Principle is used to assess whether legal and economic benefits provided to breeders ultimately benefit farmers as the most disadvantaged group. The AIS and sustainable development perspectives are used to evaluate the extent to which the agricultural IPR regime supports inclusive innovation, equitable distribution of benefits, agricultural productivity, and long-term economic sustainability (de Boon et al., 2022; Rose et al., 2021; Yin et al., 2022).

To ensure methodological validity, the research applies three forms of rigor, namely doctrinal rigor through the systematic identification and interpretation of legal norms, comparative rigor through the use of international instruments and contemporary literature, and analytical transparency through explicit explanation of the analysis process, interpretation methods, and theoretical reasoning used in the research (Ballin, 2020; Taekema, 2021).

III. RESEARCH RESULTS AND ANALYSIS

A. Construction of Indonesia's Agricultural Intellectual Property Rights Regime

Indonesia's agricultural intellectual property rights (IPR) regime is rooted in the 1945 Constitution of the Republic of Indonesia. Based on a statute approach, Article 28C paragraph (1) guarantees the right of every person to develop themselves and benefit from science and technology, thus agricultural innovation is recognised as a constitutional right. Meanwhile, Article 33

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paragraphs (3) and (4) emphasise that the management of natural resources must be directed towards the greatest prosperity of the people based on the principles of togetherness, fair efficiency, sustainability, and environmental insight. Through a conceptual and philosophical approach, it was found that the protection of plant varieties is not only intended to protect innovation but also to support social justice, economic development, and sustainable agricultural development. Thus, constitutionally, Indonesia's agricultural IPR regime is built on two main objectives, namely the protection of innovation and the prosperity of the people.

Within this framework, Law Number 29 of 2000 concerning Plant Variety Protection (PVP) places breeders as the primary subjects of legal protection. PVP rights holders obtain exclusive rights for 20 years for annual plants and 25 years for perennial plants, including the right to use the protected variety themselves or grant permission to others through a licensing mechanism. Conceptually, this construction reflects the main characteristics of the IPR regime, which functions to provide economic incentives for research, variety development, and investment in the seed sector. From a philosophical perspective, this protection is designed to encourage agricultural innovation, increase productivity, strengthen competitiveness, and support agriculture-based economic development.

In contrast, farmers' position in the PVP system is relatively more limited. Article 10 of the PVP Law only provides an exception for the use of part of the harvest of protected varieties as long as it is not done for commercial purposes, while Article 7 places local varieties owned by communities under the category of state-controlled. These findings indicate that farmers' rights function more as an exception to breeders' rights than as a stand-alone right. The existing system also does not explicitly regulate farmers' economic rights, collective community

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registration, or benefit-sharing mechanisms for local varieties developed by communities. Therefore, there is a significant difference in the level of protection between breeder's rights and farmers' rights in the applicable legal framework.

Legal protection for plant varieties is established through preventive and repressive mechanisms. PVP rights are established upon the issuance of a PVP certificate, making registration and certification the legal basis for legal protection. Furthermore, the PVP Law stipulates criminal sanctions for parties who intentionally use protected varieties without the rights holder's permission. The combination of registration, certification, and criminal law enforcement demonstrates that the PVP system is designed to provide legal certainty, protect the economic value of plant varieties, and create a conducive environment for innovation and investment in the national seed industry.

Regulatory developments following Law Number 6 of 2023 concerning Job Creation demonstrate a strengthening of the orientation toward ease of doing business, administrative efficiency, and increased investment. These reforms align various licensing and public service provisions with a risk-based licensing system without changing the basic structure of the relationship between breeder rights and farmer rights. At the implementation level, the PVP system is strengthened through various implementing regulations, such as Government Regulation Number 13 of 2004, Government Regulation Number 14 of 2004, Minister of Agriculture Regulation Number 38 of 2019, Minister of Agriculture Regulation Number 12 of 2021, Minister of Agriculture Regulation Number 15 of 2021, Minister of Agriculture Regulation Number 29 of 2021, as well as the PPVTPP technical guidelines regarding BUSS testing, substantive inspections, and management of Essential Derived Varieties. These regulations collectively establish seed governance that emphasises standardisation,

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certification, scientific testing, business certainty, and strengthening the national seed industry.

Overall, Plant Variety Protection (PVP) is a key component of Indonesia's agricultural IPR regime, interacting with the regulation of genetic resources, seed systems, agricultural innovation, and international trade. Research findings indicate that PVP not only functions as an instrument for protecting breeders' exclusive rights but also as an instrument that connects agricultural innovation systems, research investment, the seed industry, and agricultural-based economic development. Thus, Indonesia's agricultural IPR regime is built through the integration of innovation protection, seed governance, and the agricultural economic development agenda, making PVP a strategic instrument influencing the direction of sustainable economic and agricultural development in Indonesia.

B. Distributive Problems within Indonesia's Agricultural Intellectual Property Rights Regime

1. Inequality of Access to Legal Protection

Based on grammatical interpretation, the provisions of Law Number 29 of 2000 concerning Plant Variety Protection (PVP) and its derivative regulations indicate that legal protection can only be obtained through compliance with certain administrative and technical procedures. Article 5 of the PVP Law stipulates that Plant Variety Protection (PVP) rights arise upon the issuance of a PVP certificate. Furthermore, the implementing regulations require applicants to complete several procedural stages, including the submission of an application, the preparation of a variety description, BUSS (New, Unique, Uniform, and Stable) testing, and variety release prior to commercial distribution. A systematic interpretation of these provisions places them within the constitutional framework established by Article 28C(1) of the 1945

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Constitution, which guarantees every person the right to benefit from scientific and technological advancement. However, the regulatory structure, which requires administrative, technical, and financial capabilities, makes it easier for seed companies, research institutions, universities, and government institutions to access legal protection than for local breeders.

Through a teleological interpretation, the PVP system essentially aims to provide legal certainty for agricultural innovation and encourage the development of superior varieties. However, reliance on formal certification, testing, and documentation mechanisms has the potential to limit the participation of farmers developing varieties through community-based practices. This situation indicates that the goal of equitable distribution of innovation benefits has not been fully achieved because legal protection is more easily accessible to actors with greater resources. This finding is reinforced through comparative interpretation, which shows that international regimes such as the Convention on Biological Diversity (CBD) and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) increasingly emphasize the recognition of community-based innovation, farmer participation, and a more inclusive distribution of benefits. Therefore, the Indonesian PVP system still shows unequal access to legal protection, with the benefits of the agricultural IPR regime tending to be enjoyed more by formal actors than by local breeders.

2. *Corporate Dominance in Agricultural Innovation Protection*

Based on a grammatical interpretation, Article 6 of Law Number 29 of 2000 grants PVP rights holders the right to "use protected varieties themselves" and "grant approval to other individuals or legal entities to use them." This formulation indicates that rights holders obtain exclusive control over the economic use of protected varieties. Through a systematic interpretation, this

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provision does not stand alone but is connected to Government Regulation Number 13 of 2004 concerning Essential Derived Varieties, Government Regulation Number 14 of 2004 concerning licensing and transfer of rights, Ministerial Regulation Number 12 of 2021 concerning seed certification, and Ministerial Regulation Number 15 of 2021 concerning risk-based business licensing. Overall, these regulations form a legal structure that emphasizes the protection of exclusive rights, standardization, certification, and business certainty in the seed sector.

Through a teleological interpretation, the granting of exclusive rights is intended to encourage research, innovation, investment, and development of the national seed industry. However, findings indicate that the benefits of this system are more readily enjoyed by seed companies, research institutions, and formal institutions with adequate capital, technical capacity, and research infrastructure than by smallholder farmers. As a result, the distribution of economic benefits tends to be concentrated among formal actors in the agricultural innovation system. Meanwhile, through comparative interpretation, this protection structure demonstrates a close relationship with the UPOV model, which places breeders' rights at the core of protection. In contrast, international instruments such as the CBD and ITPGRFA emphasize equitable benefit sharing and recognition of farmers' contributions to the conservation and development of genetic resources. Thus, Indonesia's agricultural IPR regime still tends to favor breeders' rights and corporations in the distribution of plant variety protection benefits, rather than strengthening the rights and economic benefits for farmers.

3. BUSS Requirements as Structural Exclusion Mechanisms

Based on grammatical interpretation, plant variety protection under the Plant Variety Protection (PVT) Law requires that varieties meet the New,

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Unique, Uniform, and Stable (BUSS) criteria as the primary prerequisite for obtaining protection rights. Textually, this provision indicates that only varieties that meet the standards of novelty, uniqueness, uniformity, and stability can be recognized as objects of legal protection. Through systematic interpretation, the BUSS standard does not stand alone but is integrated with the variety release system based on Minister of Agriculture Regulation Number 38 of 2019, the seed certification system based on Minister of Agriculture Regulation Number 12 of 2021, and various PPVTPP technical guidelines regarding BUSS testing, substantive examinations, and PVT rights application procedures. This interconnectedness forms a protection mechanism that relies heavily on scientific testing, technical documentation, institutional capacity, and certain administrative costs, making access to legal protection more accessible to actors with adequate technical and financial resources.

Through teleological interpretation, the BUSS standard is essentially designed to maintain the quality of the plant variety protection system, provide legal certainty, and ensure that protection is granted only to varieties with truly innovative value. However, findings indicate that the gradual, collective, and field-experience-based development of local farmer innovations often aligns with the formal breeding logic that underpins BUSS testing. Furthermore, through comparative interpretation, the BUSS standards demonstrate similarities with the Distinctness, Uniformity, and Stability (DUS) standards used in the UPOV system, which are oriented toward protecting formal innovations. Conversely, the development of international regimes such as the ITPGRFA has begun to place greater emphasis on the recognition of farmer varieties and community-based innovations that do not always meet formal breeding standards. Thus, the BUSS standards not only serve as an instrument for quality selection and innovation protection, but also have the potential to

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become a mechanism of structural exclusion that limits the recognition and access to legal protection for some agricultural innovations developed within farming communities.

4. Potential Criminalization of Farmers

Based on a grammatical interpretation, Article 10 of the Plant Variety Protection (PVP) Law permits the partial use of the harvest of protected varieties as long as it is "not for commercial purposes." Conversely, Articles 71 and 72 emphasize that any party who "intentionally uses a protected variety without authorization" may be subject to criminal sanctions in the form of imprisonment and/or fines. Textually, this norm establishes a clear legal distinction between permissible seed use and conduct that infringes PVP rights. A systematic interpretation of this provision situates it within the overall structure of the PVP Law, which recognises breeders' exclusive rights as the principal object of legal protection, as expressly provided in Article 6. As a result, farmers' legal position is not constructed as a stand-alone right, but rather as an exception to breeder's rights, with a limited scope.

Through a teleological interpretation, this criminal regulation essentially aims to protect the economic rights of PVP holders, ensure legal certainty, and encourage innovation in the seed industry. However, in the context of smallholder agriculture, which traditionally relies on independent seed storage, exchange, and development practices, the application of this norm has the potential to create legal vulnerabilities for farmers when local practices conflict with the PVP holder's exclusive rights. Meanwhile, comparative interpretation shows that international regimes, particularly the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), recognize farmers' rights to store, use, exchange, and sell seeds in accordance with national law. This comparison reveals a normative tension between the strong protection of

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breeders' rights in Indonesia's PVP system and the growing recognition of farmers' rights in international instruments. Thus, the main problem is not merely the existence of criminal sanctions, but rather a legal construction that prioritizes the protection of breeders' rights over the balanced recognition of farmers' rights.

5. Unequal Distribution of Economic Benefits

Based on a grammatical interpretation, Article 6 of the Plant Variety Protection (PVP) Law authorizes rights holders to use, control, and license protected varieties. While Government Regulation No. 14 of 2004 emphasizes that these rights can be transferred or licensed to other parties. The structure of this norm indicates that primary economic benefits, including royalties and commercial profits, legally vest in PVP rights holders. Through a systematic interpretation, this construction also appears consistent across the PVP regime, as various implementing regulations focus more on regulating exclusive rights, licensing, certification, variety protection, and seed business governance. Conversely, no provisions explicitly mandate benefit-sharing mechanisms, royalty distribution to farming communities, or economic compensation for farmers' contributions to maintaining and developing local genetic resources.

Through a teleological interpretation, the PVP system is fundamentally designed to create economic incentives to encourage innovation, research, investment, and the growth of the national seed industry. However, research findings indicate that the resulting economic benefits primarily benefit PVP rights holders, while farmers generally only receive indirect benefits in the form of access to superior varieties developed through the formal innovation system. This situation indicates that the goal of innovation protection has been more strongly pursued than the goal of equitable distribution of economic benefits. Furthermore, through comparative interpretation, it was found that the

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Indonesian PVP regime has not yet firmly adopted the principle of equitable benefit sharing as developed in the Convention on Biological Diversity (CBD) and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), which emphasizes the recognition of farmers' contributions and the equitable distribution of benefits from the use of genetic resources. Thus, the distribution of economic benefits in the Indonesian agricultural IPR regime still shows asymmetric tendencies, where breeders receive stronger protection and economic benefits than farmers as parties who contribute to the agricultural innovation system.

6. *Limitations of the Current Regime in Supporting Sustainable Agricultural Development*

Based on a grammatical interpretation of Article 33 (4) of the 1945 Constitution indicates that the Constitution mandates an economic system grounded in the principles of equitable efficiency, sustainability, and environmental soundness. Accordingly, various regulations post-Law Number 6 of 2023 emphasize "ease of doing business," "risk-based licensing," and "service efficiency," demonstrating a strong orientation toward economic growth and the development of the agricultural business sector. Through a systematic interpretation, the regulation of Plant Variety Protection (PVT), seed certification, business licensing, and their derivative regulations form an institutional framework that supports innovation, investment, and the strengthening of the national seed industry. However, this system does not adequately regulate the protection of community-based farmer innovations, the strengthening of farmer-breeding institutions, or the mechanism for sustainable benefit distribution. From a teleological interpretation perspective, the goal of sustainable agricultural development should encompass a balance between innovation, productivity, farmer welfare, genetic resource conservation, and economic sustainability. However, the prevailing regulatory orientation still

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places greater emphasis on protecting formal innovation and developing the seed industry rather than strengthening the social sustainability dimension of the agricultural innovation system.

Research findings indicate that Indonesia's agricultural intellectual property rights regime is built through the integration of innovation protection, seed governance, and agricultural economic development based on Article 28C paragraph (1) and Article 33 of the 1945 Constitution. Normatively, this system places breeders as the primary subjects of protection through exclusive rights, licensing, certification, and law enforcement, while the position of farmers remains relatively limited. As a result, benefits, access, and legal protection tend to be more easily enjoyed by seed companies, research institutions, and formal actors compared to local breeder farmers. This inequality is reflected in the dominance of breeder's rights, weak benefit-sharing mechanisms, the function of BUSS as a structural barrier, the potential criminalization of traditional seed practices, and limited recognition of community-based innovation. Through comparative interpretation, this condition differs from the approaches developed in Agricultural Innovation Systems (AIS), the Convention on Biological Diversity (CBD), and the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) which emphasize farmer participation, collaborative innovation, genetic resource protection, and inclusive benefit distribution. Therefore, although Indonesia's PVP regime has supported the protection of innovation, investment, and the economic sustainability of the seed sector, the existing system still faces limitations in realizing social justice and sustainable agricultural development as a whole.

Indonesia's agricultural intellectual property rights regime is built through the integration of innovation protection, seed governance, and the agricultural economic development agenda based on Article 28C paragraph (1)

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and Article 33 of the 1945 Constitution of the Republic of Indonesia. Normatively, this system provides a central position to breeders through the granting of exclusive rights, economic protection, licensing mechanisms, certification, and criminal law enforcement as stipulated in Law Number 29 of 2000 concerning Plant Variety Protection and its derivative regulations. Reforms following Law Number 6 of 2023 concerning Job Creation further strengthen the orientation of ease of doing business, investment certainty, and efficiency of seed sector governance through standardisation, certification, risk-based licensing, and BUSS testing, which form the foundation of the formal agricultural innovation system. However, at the same time, this study found various distributive problems, indicating that the benefits, access, and legal protection under this regime are not evenly distributed. Complex administrative and technical requirements make access to legal protection easier for seed companies, research institutions, and formal institutions compared to local breeder farmers. The dominance of breeder's rights, the absence of a robust benefit-sharing mechanism, the function of BUSS as a mechanism of structural exclusion, the potential criminalisation of traditional seed practices, and the limited recognition of community-based innovation indicate that Indonesia's PVT regime remains more oriented towards protecting formal innovation and developing the seed industry than towards inclusive benefit distribution. Thus, the research findings indicate a normative tension between the goal of protecting innovation in the agricultural intellectual property rights regime and the goals of social justice, sustainable economic development, and sustainable agricultural development, which are simultaneously mandated by the Indonesian constitution.

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C. Equal Liberty Principle and the Recognition of Innovation Rights within Indonesia's Agricultural Intellectual Property Rights Regime

The principle of Equal Liberty in the theory of justice as fairness affirms that every individual has the same right to basic freedoms, including recognition of the capacity to think, innovate, and benefit from the results of their innovation (Freeman, 2018; Rawls, 1971, 1988, 2005). In the Indonesian context, Article 28C paragraph (1) and Article 33 of the 1945 Constitution of the Republic of Indonesia normatively recognise innovation as a constitutional right of all citizens while directing it towards the prosperity of the people. Research findings indicate that at the constitutional level, there is no distinction between innovations produced by formal breeders and community-based innovations. However, in the Plant Variety Protection (PVP) regime, this recognition has shifted because Law Number 29 of 2000 provides very strong protection to breeders' rights through exclusive rights, licensing, certification, and criminal protection as instruments to encourage innovation, investment, and growth of the seed industry (Purwanto et al., 2024). Thus, the PVP regime is relatively successful in guaranteeing the freedom to innovate and the economic rights of formal breeders through adequate legal certainty.

In contrast, farmers have not received equal legal recognition as actors in innovation. Farmer's rights are positioned more as an exception to the exclusive rights of PVP holders than as an independent right, as evidenced by restrictions on the use of seeds for non-commercial purposes and the state-controlled status of local varieties. This situation creates an imbalance in legal recognition between formal breeders and farmers, even though both contribute to the development of genetic resources and agricultural innovation. From a Rawlsian perspective, this unequal recognition results in the freedom to innovate not having equal value for all citizens (Freeman, 2018; Rawls, 1971; Wenar, 2008).

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These findings also demonstrate the dominance of the agricultural IPR paradigm, which prioritises formal innovation and commercialisation over community-based collective innovation, despite farmers' significant historical contributions to germplasm conservation, local variety development, and the maintenance of genetic diversity (Antons et al., 2020; Ghimire et al., 2021). Therefore, the Indonesian agricultural IPR regime only partially fulfills the Equal Liberty Principle and needs to be reconstructed by strengthening legal recognition of farmers' innovations, developing more inclusive protection mechanisms, and recognising farmers' rights as stand-alone rights so that innovation protection is more consistent with the principle of equal liberty (Freeman, 2018; Rawls, 1971, 1988, 2005; Wenar, 2008).

D. Fair Equality of Opportunity and Structural Inequality in Access to Agricultural Intellectual Property Protection

According to Rawls (1968, 1971), the principle of fair equality of opportunity in the theory of justice as fairness emphasises that justice is not sufficiently realised through formal openness to a right, but also demands substantively equal opportunities for individuals who have the same abilities and motivations.

In the context of Indonesia's Plant Variety Protection (PVP) regime, this study shows that although Law Number 29 of 2000 formally opens access to legal protection for any individual or legal entity producing new varieties, such access requires complex administrative, technical, and scientific procedures, including the preparation of variety descriptions, BUSS (New, Unique, Uniform, Stable) testing, variety release, and seed certification. As a result, seed companies, research institutions, universities, and government institutions have an easier time obtaining legal protection than local breeders who have limited financial resources, research facilities, and administrative capacity.

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The BUSS requirements, which aim to ensure the quality of innovation, also serve as structural barriers in practice, as they require costs, scientific documentation, and testing facilities that are not always available to smallholder farmers. This finding aligns with research showing that Indonesia's seed and IPR systems are more accessible to formal actors than to community-based innovators. The equity afforded by the PVP regime tends to be formal rather than substantive (Antons et al., 2020; Barry, 2017; Ghimire et al., 2021; Purwanto et al., 2024). Furthermore, seed governance, which emphasises standardisation, certification, and business certainty, also tends to favour actors with stronger economic capital and institutional access, thus reinforcing pre-existing inequality of opportunity (Ghimire et al., 2021; Shabir, 2020).

From a Rawlsian perspective, this condition indicates that Indonesia's agricultural IPR regime has not fully met the principle of fair equality of opportunity because the actual opportunities to obtain legal protection are still determined by differences in social, economic, and institutional resources (Freeman, 2018; Rawls, 1971). This finding can also be explained through the Agricultural Innovation Systems (AIS) perspective, which views agricultural innovation as the result of the interaction of various actors, including farmers, government, research institutions, the private sector, cooperatives, and organisations (de Boon et al., 2022; Yin et al., 2022).

Within the AIS framework, farmers are not merely users of technology but also producers of knowledge and innovation that contribute to the transformation of agricultural systems. Therefore, an effective legal protection system should provide an inclusive space for participation for all innovation actors. This view is reinforced by Rose et al. (2021), who emphasise the importance of co-innovation and equitable distribution of benefits, and by de

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Boon et al. (2022), who show that the success of innovation governance is strongly influenced by participation and collaboration between stakeholders.

Compared to the AIS principles, Indonesia's agricultural IPR regime is still more oriented toward protecting formal innovations and strengthening the seed industry than developing participatory mechanisms that enable farmers to gain equal access and benefits. Therefore, the primary problem with the PVP regime lies not in the lack of legal protection, but rather in the distribution of opportunities to obtain such protection. Therefore, the reconstruction of the agricultural IPR regime needs to be directed at reducing structural barriers, simplifying protection procedures, strengthening the capacity of farmer breeders, and developing more inclusive mechanisms to allow agricultural innovation to flourish through broader and more equitable participation (de Boon et al., 2022; Freeman, 2018; Rawls, 1971; Rose et al., 2021; Yin et al., 2022).

E. Difference Principle and the Distribution of Benefits within Indonesia's Agricultural Intellectual Property Rights Regime

Rawls's difference principle states that social and economic inequalities can only be justified if they produce the greatest benefits for the least advantaged groups (Rawls, 1971). In the context of Indonesia's agricultural intellectual property rights regime, research findings indicate that the Plant Variety Protection (PVP) structure normatively provides far greater benefits to breeders through exclusive rights, licensing rights, royalty rights, economic protection, and support for criminal law enforcement. In contrast, farmers generally only receive indirect benefits in the form of access to superior varieties produced by the formal innovation system.

These findings are in line with research by Purwanto et al. (2024), which shows that PVP certificates provide strong economic protection and legal certainty to rights holders, as well as research by Ghimire et al. (2021), which

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found that the Indonesian PVP system is more oriented towards protecting breeder rights than recognising farmers' rights. Thus, the PVP regime does create inequality in the distribution of rights and benefits. However, from Rawls' perspective, the existence of this inequality can only be justified if it is proven to improve the welfare of farmers as the most vulnerable group in Indonesia's agrarian structure (Nagel, 1973; Rawls, 1971).

However, this study found that to date, there is no normative mechanism that explicitly guarantees that the economic benefits received by breeders will be redistributed to farmers through benefit-sharing schemes, royalty distribution, recognition of local genetic resource contributions, or increased economic opportunities for breeder farmers. Instead, various findings indicate a tendency for corporate dominance in the agricultural innovation protection system. At the same time, farmers continue to face limited access to legal protection and even face the potential risk of criminalisation when traditional seed practices conflict with the exclusive rights of PVT holders (Antons et al., 2020; Suastuti et al., 2023).

These findings reinforce Shabir's (2020) critique that the political orientation of Indonesian PVP law still places greater emphasis on economic interests and breeder protection than on social justice and food sovereignty. From a difference principle perspective, this situation demonstrates that the inequality created by the PVP regime has not been proven to provide maximum benefits to the most disadvantaged groups, thus its distributive legitimacy remains problematic (Harsanyi, 1975; Rawls, 1971).

This interpretation also draws support from various developments in the literature on distributive justice and sustainable agricultural development. Rawls asserts that social institutions should be evaluated based on their ability

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to improve the conditions of groups at the bottom of the distribution of benefits (Müller & Renes, 2021; Rawls, 1971).

In a study on agricultural water resource allocation, Imani et al. (2025) demonstrated that the application of Rawls' principles can balance the interests of productivity, environmental sustainability, and the welfare of vulnerable groups through a more equitable distribution of benefits. Contrary to these findings, this study demonstrates that Indonesia's agricultural IPR regime is still more effective in protecting investment, formal innovation, and the seed industry than in ensuring the redistribution of benefits to farmers as the primary managers of agricultural genetic resources.

Therefore, it can be concluded that the current Indonesian agricultural intellectual property rights regime does not yet fulfill the Difference Principle because the unequal protection provided to breeders is not accompanied by a legal mechanism that ensures increased welfare, access to technology, and economic opportunities for farmers as the most disadvantaged group in the national agricultural system (Ghimire et al., 2021; Imani et al., 2025; Rawls, 1971).

F. Agricultural Intellectual Property Rights Regime, Sustainable Economic Development, and Sustainable Agricultural Development

Research findings show that Indonesia's agricultural intellectual property rights regime is designed to support economic development through protecting innovation, legal certainty, and strengthening the seed industry. The granting of exclusive rights to breeders, licensing mechanisms, economic protection, certification, and regulatory reform following Law Number 6 of 2023 concerning Job Creation reflect the state's orientation to increase investment, accelerate innovation, and strengthen the competitiveness of the national seed sector.

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From the perspective of sustainable economic development, the protection of intellectual property rights functions as an innovation incentive and an instrument to attract long-term investment. This finding is in line with the study of Antons et al. (2020), which shows that plant variety protection is developing as part of the modernisation of the seed sector and integration into the global trade and innovation regime, and is supported by the theory of rural innovation systems, which places innovation as the main driver of economic growth and sustainable development (Yin et al., 2022).

However, the resulting economic benefits have not been distributed evenly because the breeder's rights-centered protection structure has resulted in royalties, licenses, and control of the seed market being predominantly enjoyed by seed companies, research institutions, and other formal actors. At the same time, farmers generally only receive indirect benefits through access to superior varieties. This finding is consistent with research by Ghimire et al. (2021), Shabir (2020), and Suastuti et al. (2023), which shows that Indonesia's PVP system still protects the interests of breeders more strongly than farmers, thus failing to realise the principle of inclusive growth fully.

From the perspective of sustainable agricultural development, the existing system is strong in supporting formal innovation through BUSS standards, seed certification, variety release, and standardised seed governance. Still, it lacks in accommodating community-based innovation, participatory breeding, and farmer contributions in genetic resource development. The Agricultural Innovation Systems (AIS) literature emphasises that agricultural sustainability is determined not only by technological progress, but also by the participation of various actors, co-innovation, innovation networks, and inclusive benefit distribution (de Boon et al., 2022; Rose et al., 2021).

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Furthermore, the involvement of farmer organisations, cooperatives, and intermediary institutions is seen as crucial for strengthening social sustainability in agricultural development (Gutiérrez Cano et al., 2023). This perspective aligns with the principles developed in the CBD and ITPGRFA, which prioritise genetic resource conservation, farmer rights recognition, and equitable benefit sharing as key elements of sustainable agricultural development.

Therefore, although Indonesia's agricultural IPR regime has successfully built an institutional foundation that supports innovation, investment, and the economic sustainability of the seed industry, this system has not fully integrated the social sustainability dimension through the protection of community innovation, equitable distribution of benefits, and strengthening the position of farmers in the agricultural innovation system. Thus, Indonesia's agricultural IPR regime has supported the economic sustainability of the seed sector, but has not fully realised the inclusive sustainable agricultural development required by the AIS approach, the principle of food sovereignty, and the CBD and ITPGRFA frameworks (de Boon et al., 2022; Ghimire et al., 2021; Gutiérrez Cano et al., 2023; Rose et al., 2021).

G. Reconstructing Indonesia's Agricultural Intellectual Property Rights Regime Toward Distributive Justice and Sustainability

Based on the research findings, the reconstruction of Indonesia's agricultural intellectual property rights regime in Picture 1 needs to begin with strengthening the recognition of farmers as innovation actors who have a real contribution to the development of genetic resources, local varieties, and agricultural knowledge systems. Pillar 1 of the Equal Liberty Principle perspective demands that farmers' innovative capacity receive equal legal recognition with formal breeders so that farmers' rights are no longer

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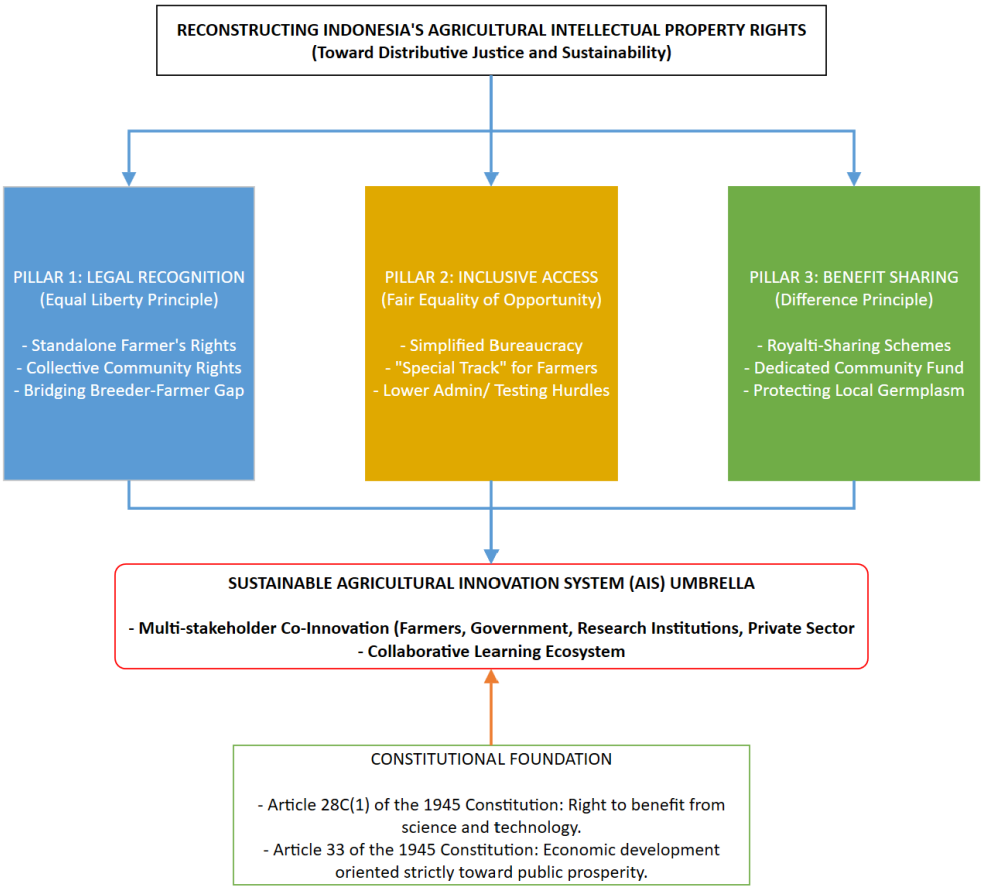
positioned as an exception to breeders' rights, but as a stand-alone right, including in the form of recognition of the collective rights of farming communities over varieties developed through participatory means.

This proposal aligns with the findings of Antons et al. (2020) and Ghimire et al. (2021), which show that Indonesian farmers have played a role as plant breeders, but PVP regulations are still more oriented towards protecting formal breeders than recognising community-based innovation. Therefore, legal reforms need to be directed at strengthening the legal position of farmers as innovators in the plant variety protection system (Antons et al., 2020; Freeman, 2018; Ghimire et al., 2021; Rawls, 1971).

Picture 1. Reconstructing Indonesia's Agricultural Intellectual Property Rights



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Furthermore, Pillar 2, inclusive access based on the principle of Fair Equality of Opportunity, requires a more inclusive mechanism for access to legal protection. Research findings indicate that current BUSS requirements, certification, and administrative procedures are easier for seed companies and research institutions to meet than for local farmer-breeders. Therefore, system reconstruction needs to include simplifying registration procedures, reducing administrative barriers and testing costs, and establishing special protection tracks for farmer varieties and community-based innovations. This approach aligns with Rawls' principle that equal opportunity must be realised substantively, not merely formally (Barry, 2017; Rawls, 2017). Furthermore, developing a more inclusive mechanism is also consistent with the AIS recommendation that farmers be an integral part of innovation networks and not simply users of technology (de Boon et al., 2022; Yin et al., 2022).

Subsequent reforms need to be directed at Pillar 3, namely the establishment of an equitable benefit-sharing mechanism to ensure that unequal protection provided to breeders generates tangible benefits for farmers, a relatively disadvantaged group. From the perspective of the Difference Principle, inequality can only be justified if it improves the welfare of the most disadvantaged groups (Rawls, 1971). Therefore, the PVP system needs to integrate royalty-sharing schemes, recognition of the contribution of local genetic resources, community funds, and mechanisms for distributing benefits derived from the use of varieties developed based on farmer knowledge and resources. This need also aligns with criticisms of the dominance of breeders' rights in the Indonesian PVP system, which has not been balanced by adequate economic protection for farmers and local communities (Ghimire et al., 2021; Shabir, 2020; Suastuti et al., 2023).

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The reconstruction of Indonesia's agricultural IPR regime needs to be placed within the framework of the Sustainable Agricultural Innovation System (AIS) in Figure 1, which integrates the objectives of innovation, distributive justice, and sustainability. The AIS approach emphasises the importance of farmer participation, co-innovation, collaborative learning, and innovation governance that equally involves the government, research institutions, the private sector, cooperatives, and farmer organisations (de Boon et al., 2022; Gutiérrez Cano et al., 2023; Rose et al., 2021). This reconstruction must also be in line with Article 28C paragraph (1) of the 1945 Constitution of the Republic of Indonesia, which guarantees the right of every person to benefit from science and technology, and Article 33 of the 1945 Constitution of the Republic of Indonesia, which places the prosperity of the people as the primary goal of national economic development. Thus, the direction of reforming Indonesia's agricultural intellectual property rights regime is not only aimed at strengthening innovation and investment, but also at realising a fairer, more inclusive, and sustainable protection system for all actors in the national agricultural innovation system (de Boon et al., 2022; Gutiérrez Cano et al., 2023; Rawls, 1971; Rose et al., 2021).

Reconstructing Indonesia's agricultural intellectual property rights regime based on strengthening farmer rights, expanding access to inclusive legal protection, establishing equitable benefit-sharing mechanisms, and innovation governance based on Agricultural Innovation Systems (AIS) not only contributes to distributive justice but also supports sustainable economic and agricultural development. Recognizing farmers as actors in innovation, simplifying access to legal protection, and more equitable distribution of benefits have the potential to increase productivity, expand rural economic participation, strengthen the national seed industry, and encourage more

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inclusive economic growth (de Boon et al., 2022; Rose et al., 2021). In addition, this reconstruction model contributes to the achievement of SDG 2 (Zero Hunger) through strengthening agricultural innovation, SDG 8 (Decent Work and Economic Growth) through developing an innovation-based economy, SDG 10 (Reduced Inequalities) through reducing the gap between breeders and farmers, SDG 12 (Responsible Consumption and Production) through sustainable genetic resource governance, and SDG 16 (Peace, Justice and Strong Institutions) through strengthening justice and more equal access in the plant variety protection system (Gutiérrez Cano et al., 2023; Rawls, 1971).

IV. CONCLUSIONS

This study found that the Indonesian agricultural intellectual property rights regime was built through the integration of innovation protection, seed governance, and agricultural economic development based on Article 28C paragraph (1) and Article 33 of the 1945 Constitution of the Republic of Indonesia. However, an analysis of the Plant Variety Protection (PVT) Law and its derivative regulations shows that the existing system still places breeders' rights as the center of protection through exclusive rights, licenses, royalties, certification, and law enforcement. In contrast, farmers' rights have not received equal recognition. Based on the Equal Liberty Principle, protection of freedom of innovation is still partial because it benefits breeders more than farmers. Based on Fair Equality of Opportunity, the opportunity to obtain legal protection is still more formal than substantive because seed companies and research institutions more easily meet the requirements for BUSS, certification, and technical capacity than by local breeder farmers. Meanwhile, based on the Difference Principle, the inequality in protection provided to breeders has not been balanced by a benefit-sharing mechanism that can guarantee increased

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farmer welfare. Despite this, Indonesia's agricultural IPR regime has been proven to support legal certainty, investment, and modernisation of the seed industry, but has not yet fully realised inclusive economic development or sustainable agricultural development that places farmers as the main actors in the agricultural innovation system.

The scientific contribution of this research lies in the development of an analytical model that integrates John Rawls's theory of justice as fairness with the Agricultural Innovation Systems (AIS) approach to assess the relationship between innovation protection, distributive justice, and sustainability. Based on this framework, the research proposes five directions for reconstruction: strengthening the recognition of farmers as innovation actors, expanding access to inclusive legal protection, establishing equitable benefit-sharing mechanisms, strengthening AIS-based innovation governance, and aligning the agricultural IPR regime with constitutional mandates. Theoretically, this research expands the application of Rawls's theory in the study of agricultural IPR; practically, the results can serve as a basis for reforming the PVP Law to strengthen farmers' rights and create a fairer and more sustainable agricultural innovation system. The limitation of this research lies in the use of a normative approach, which has not yet tested the empirical impact of the PVP regime on farmer welfare, the distribution of economic benefits, and the performance of the agricultural innovation system. Therefore, further research needs to use an empirical or socio-legal approach to examine the implementation of farmer rights, the effectiveness of benefit sharing, the impact of plant variety protection on farmer welfare, and the development of a sui generis plant variety protection model that is more in line with the principles of distributive justice, food sovereignty, and sustainable agricultural development.

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