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REVIEW

The Regulation of Genetic Engineered Plants and Production of Plant Varieties in Nigeria

Ejiro Kore-Okiti*

ABSTRACT

The rise in use of technology comes with it a wave of innovations at almost every fragment of the human life. These innovations have great bearing with respect to their protection as intellectual property rights. With the development in many irresistible state of the art equipment, there have been consequential innovations, advantageous mutations and varied explorations in diverse fields of human endeavor, which to say the least are methodological based and solution oriented. The reality of these innovations has arisen a corresponding need to protect various sort property rights, either via the grant of a patents, copyrights, trademarks or industrial designs and in this context, plant breeders' rights. Using doctrinal research methodology, the focus of the ensuing discourse is targeted at navigating the means for the regulation of genetically engineered plants and plant breeding in Nigeria, taking into consideration applicable regulatory frameworks relevant to the subject under view. The article examines the strengths and lacunas inherent in the Nigeria Plant Variety Protection Act, 2021 and as part of its findings, the discourse establishes that there is need for more awareness and fortified implementation collaborations by stakeholders to ensure the intended objective of the Act is realised.

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Delta State University, Nigeria.

**Corresponding Author:*
e-mail: ejiro.okiti@delsu.edu.ng

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1. Introduction

With the help of the legislature, stakeholders in the agricultural sector were compelled to create a framework addressing plant breeding rights in the country; these benchmarks included the need for greater food security, a decrease in pollution related to agriculture, the development of sustainable energy sources and sustainable agricultural practices, and numerous other spiral advantages. With the help of the legislature, stakeholders in the agricultural sector were compelled to create a framework addressing plant breeding rights in the country; these benchmarks included the need for greater food security, a decrease in pollution related to agriculture, the development of sustainable energy sources and sustainable agricultural practices, and numerous other spiral advantages.

With a population of more than 200 million, agriculture is Africa's fastest-growing economy and accounts for roughly 21.07% of the country's nominal GDP in the second quarter of 2023. With crop production making up 88.06% of the agricultural sector's total nominal value in the same quarter, it is believed to be the primary sub-activity in Nigeria. Fisheries, forestry, and cattle are further sub-activities (Angbulu, 2023).

Due to its expanding population and the potential effects on the region's economic growth, Nigeria is the most populous country in Sub-Saharan Africa. Apart from being a popular location for international investment, the nation also draws scientists, farmers, breeders, and other members of the agricultural sector. As per the National Agricultural Seeds Council, the majority of her 157 registered seed businesses generate fewer than 1,000 metric tons annually. The primary private seed trading association in Nigeria is the Seed Entrepreneurs Association of Nigeria, which has about 67 registered members. Therefore, it is believed that the PVP Act will stimulate both domestic and foreign investments in the Nigerian seed industry by commercializing seed and propagation material (Bolowade, 2021).

2. Nature and Meaning of Genetic Engineering and Plant Varieties

In developing countries, more than 30% of people suffer from protein-energy malnutrition (PEM), which slows or retards growth and increases the risk of disease. On the other hand, plant breeders believe they have the technologies needed to lower the prevalence of this harmful disease. PEM is brought on by a lack of some essential amino acids, which are the building blocks of proteins. The body cannot produce the required protein without these essential elements, which leads to the symptoms indicated above. Instead of seeking a cure from medical professionals, plant breeders looked into the cause of the problem and offered a solution: Applying genetic engineering (Gwinn, 2019).

The method geneticists use to alter, add, remove, or rotate genes is known as genetic engineering. An organism's genetic makeup can be changed to produce a transformation with positive effects by modifying the area of its DNA that determines its characteristics. In particular, the purpose of plant breeding is often to produce plants that are resistant to pests and diseases, have larger, more nutrient-dense fruits, and have a more succulent flavor. Organisms usually referred to as genetically modified or genetically altered species are the product of this procedure (Gwinn, 2019). Robert and Baylis (2008) defined genetic engineering as the intentional modification, enhancement, or repair of form or function by a number of techniques of genetic material, primarily deoxyribonucleic acid, or DNA.

Genetic engineering, often known as recombinant DNA technology, is defined as a group of methods for separating and reassembling genetic material, mostly DNA, from various biological species. In order to create novel genetic material combinations that are heritable, the resultant hybrid DNA is subsequently introduced into an organism (Rosenberg, 2017).

Based on the hybridization or mixing of the genetic or hereditary traits of the donor species into the recipient species, genetic engineering is simply the process of altering a species' DNA to produce a recombinant breed of species, as the terminology suggests. Genetic engineering is the process of modifying or manipulating an organism's genes through technology. It's also known as genetic manipulation or genetic alteration. To generate new or improved organisms, it is a group of techniques for changing the genetic makeup of a cell, including as transferring genes inside and between species. While recombinant DNA techniques are used to separate and replicate the required genetic material, artificial DNA synthesis is used to create new DNA. The creation and use of a construct typically makes it possible for this DNA to be introduced into the host organism (Nicholl, 2023).

Genetically engineered organisms are known as genetically modified organisms (GMOs). It is important to remember that genetic engineering finds application in a wide range of domains, such as industrial biotechnology, research, medicine, and agriculture. Gene function and expression are examined in GMO research using a variety of techniques, including gain-of-function, loss-of-function, and expression studies. Removing the genes causing particular human ailments can help create animal models of those diseases. For the creation of hormones, vaccines, and other medications, genetic engineering holds great potential. Additionally, gene therapy may be utilized to treat hereditary illnesses. Pharmaceuticals can be produced using the same industrial techniques that produce enzymes for cheeses, laundry detergent, and other products. (Nicholl, 2023). However, PLANT VARIETIES refers to a more specific group of plants that have been genetically modified to produce a distinct variety that is chosen from within a species and shares a common set of traits.

Among the benefits of genetically modified crops are the ability to lower the cost of fruits and vegetables, boost the output of staple crops, improve the development of sustainable energy sources, and reduce pollution associated with agriculture (Martinez-Gomez, 2019)

3. Concerns on Protection of Property Rights on Genetic Engineered Processes

Even in the face of concerns about the technology employed in species genetic modification, this research deals with the ownership rights that arise when biological species are mutated to create a particular breed. In other words, can the alteration or manipulation of an organism's genes result in the creation of a new or altered creature, so creating an assigned intellectual property right?

According to Solanki and Chauhan (2019), scientists spend years researching new cultivars that are crucial to our economy. Therefore, it is crucial to protect their rights to use those transgenic plant species, particularly when creating new GMOs. IPR: Trade secrets, trademarks, and patents are examples of intellectual property rights reserved for genetic engineering and biotechnology. Moreover, publications pertaining to software, standard operating procedures, concepts, processes, and other products may also be taken into account in relation to intellectual property rights. This basically means that no one may use any idea or product that comes from a genetically modified process, either totally or partially, without the original developer's permission.

Patents monopolize the ability to develop, market, or import inventions. After the patent expires, the product may be used by the general public in the form of "no profit sharing". Trade secrets are a specific

kind of intellectual property rights (IPRs) wherein product details, standard operating procedures, protocols, business concepts, and customers are either protected or divulged. Copyrights are only granted to prevent unlawful use of an organization's, researcher's, or business's databases and software (Angbulu, 2023).

In addition to the main types of intellectual property rights (IPRs) in biotechnology, plant breeders' rights allow researchers to limit the use of new genetically modified plant species without authorization. These rights are granted for a period of about 20 years. Notably, genetically stable, new, uniform, commercially relevant and unique types are covered in this form of IPR (Solanki & Chauhan, 2019). However, different countries' internal laws govern the protection of genetically modified species' property rights.

4. Regulatory Frameworks on Plant Varieties Rights

Highlights of the International Convention for the Protection of New Varieties of Plants (ICPNVP), 1991

The 1991 International Convention for the Preservation of New Varieties of Plants (UPOV, 1991). The ICPNVP Act of 1978 was amended by the Convention (Art 1(iii) ICPNVP).

In its concluding sentence, the Convention clarified the meaning of terms like "breeder" and "breeder's right variety," among others. The definition of breeder was:

a. Someone who grew, discovered, or produced a variety.
b. The person who hires the aforementioned professional or, if relevant, the party who has hired the latter to complete the work.
c. Whoever takes over the title from the first or second person specified, as applicable (Art 1(iv) ICPNVP).

Conversely, "breeder's right" was defined as the breeder's right as stipulated in the convention. (Art 1(v) ICPNVP).

As a result, variety is the lowest known rank of a group of plants that belong to a single botanical taxon. This category may comprise any of the following, even if not all conditions are met for a breeder's privilege to be granted:

a. Characterized by the expression of traits brought about by a certain gene or combination of genes.
b. Capable of being distinguished from other plant groups by displaying at least one of the characteristics mentioned above.
c. Assessed collectively for suitability for unaltered propagation (Art 1(5) ICPNVP).

It is important to highlight that the ICPNVP, 1991, requires all parties to the Convention to guarantee the grant and protection of a breeder's right as one of their fundamental duties (Art 2 ICPNVP). In this context, "contracting party" refers to a state or an international body that is a party to the Convention (Art 1(vi) ICPNVP).

According to Article 3 of the Convention, States parties who are already members of the Union are also required to protect new plant varieties (Art 1(x) ICPNVP). and new members at the time of the Convention's enactment. This must be done by the latest five years (for old members) or ten years (for new members) after the date of the convention's signature in order to guarantee the preservation of all plant species and genera. (Art 3 ICPNVP).

Furthermore, with respect to breeders' rights, the Convention stipulated that contracting parties must give National Treatment. The Convention gives inhabitants, legal entities, and natural persons of each contracting party the ability to enjoy their area, as well as those who live there and have regional offices there (with regard to the granting of breeder's rights). As long as the aforementioned nationals, natural persons, or legal entities adhere to the rules and regulations established for the citizens of the aforementioned other contracting party, each of these parties will be treated in the same manner as what is currently or may be granted to its own nationals under the laws of that other contracting party. (Art 4 ICPNVP).

4.1. Conditions for the Grant for Breeders Right Under the ICPNVP, 1991

In particular, the Convention lists four requirements that must be met in order for a plant breeder's right to be granted. According to the convention, a breeder's right will be given where the variety is (1) new or novel, (2) distinct, (3) uniform, and (4) stable.

4.1.1. New or Novel

Freshness is the same as novelty. At the time of applying for a breeder's right, a variety shall be deemed new if no propagating or harvested material has been sold or otherwise transferred to anybody for the purpose of exploiting the variety, either by the breeder or with their approval.

The disputed variety has not been cultivated or harvested in the contracting party's territory where the application was filed, or in any other territory, in the four years prior to the application date, or, in the case of trees or vines, in the six years before the date and time of application submission. (Art 6 (i) ICPNVP).

Even if a variety was sold or disposed of to another party described in paragraph (1) prior to the time restriction, a contractual party may nevertheless consider it a recent production to satisfy the uniqueness criterion. This is applicable in cases where the contracting party provides protection to a species or genus of plants that were not previously protected by this convention or a previous act. (Art 6(ii) ICPNVP).

4.1.2. Distinctness

In the event that a variety is easily distinguished from any other variety that was generally recognized to exist at the time the application was submitted, it is deemed distinct. Specifically, if an application is successful in having the other variety added to an official variety register or granting a breeder's right, as applicable, then the act of submitting an application in any country to possess a different variety added to an official variety register or to have a breeder's right granted is deemed to have made the other variety known as of the application date (Art 7) (ICPNVP).

4.1.3. Uniformity

The agreement states that a variety is considered uniform if its pertinent traits are constant, accounting for any variances that might arise as a result of its particular propagation mechanism (Art 8 ICPNVP).

4.1.4. Stability

The variety will be deemed stable if its relevant characteristics remain consistent after several propagations or, in the case of a particular propagation cycle, at the end of each propagation cycle (Art 9 ICPNVP).

The domestic frameworks established by parties to the Convention on the requirements for awarding breeders' rights exhibit some degree of homogeneity with respect to the aforementioned four criteria.

4.2. Application for the Grant of the Breeder's Right

Article 10 of the ICPNVP provided for application filing. Article 10(1) stipulated the location of the initial application. At this stage, the breeder can choose which Contracting Party's consent to use when submitting his first breeder's right application.

Additionally, the Convention allows the breeder to apply again for the conferment of a breeder's right. Without waiting for a response from the authority of the Contracting Party that received the first application, this can be accomplished by submitting applications to the authorities of other Contracting Parties (Art 10(2) ICPNVP).

The Convention also ensures the safety and independence of a breeder. Because another State or intergovernmental organization has already awarded protection for the same variety, refused an application for it, or seen its protection expire, no Contracting Party may, therefore, deny a breeder's right or restrict its lifespan (Art 10(3) ICPNVP).

When a breeder properly files an application with one of the Contracting Parties for the protection of a variety, they are given a one-year priority period (referred to as the "first application"). The breeder may apply to any other Contracting Party during this period to grant a breeder's right for the same variety (known as the "subsequent application"). The right of priority for plant breeders is also covered under the Convention. The first application's filing date is used to determine this priority period; (Art 11) (ICPNVP). The subsequent period's computation does not take the filing date into account.

According to the Convention, petitions for the granting of breeder's rights must be reviewed by Contracting Parties. An assessment to verify compliance with the standards outlined in Articles 5 through 9 of the Convention must be carried out prior to the granting of such rights. As part of the inspection procedure, the authority may decide to expand the variety or carry out other required tests. As an alternative, it can order additional testing or growth of the variety or take into account the outcomes of earlier trials or growing tests (Art 12 ICPNVP). The breeder may also be asked by authorities to submit all pertinent information, documents, or materials required for the assessment. In this case, the nation's authorized local parastatal is in charge of carrying out the Convention pertaining to the granting of breeder's rights (Art 30 (1)(ii) ICPNVP).

As part of the application processes for acquiring a breeder's right, the Convention also includes provisions for Provisional Protection. In this regard, the Convention stipulated that each Contracting Party must have procedures in place to safeguard the interests of breeders between submitting or publishing an application to be considered for a breeder's right and such application being approved. As a result of these acts, the holder of the breeder's right will have the bare minimum of a right to just compensation from anybody who, at the time, took any actions that, if the right is granted, require the breeder's agreement as outlined in Article 14 of the ICPNVP deals specifically with scope of a breeder's rights. A Contracting Party has the option to specify that the aforementioned measures will only be applied to those individuals who have been notified by the breeder that the application has been submitted (Art 13 ICPNVP).

4.3. The Rights and Limitations of the Breeder

Article 14 of the Convention enumerated the extent of a breeder's rights. The following activities involving "propagating material of the protected variety," pursuant to Articles 15 and 16, require the breeder's approval, per the provision:

i) Production or reproduction (multiplication),
ii) Conditioning for the purpose of propagation,
iii) Offering for sale,
iv) Selling or other marketing,
v) Exporting,
vi) Importing,
vii) Stocking for any of the purposes mentioned in (i) to (vi), above.

It is the breeder's right to limit and condition his permission (Art 14 ICPNVP). Therefore, only with the breeder's consent can a third party benefit from the aforementioned privileges or rights that a breeder is entitled to under Article 14 of the Convention, subject to certain restrictions. However, whether such authorization should be explicitly declared or assumed was not addressed in the Convention.

Consequently, the Convention lists the following as breeder's rights exclusions. They consist of:

1. Private actions that are not profitable.
2. Acts performed in a test environment.
3. Activities done with the goal of breeding other kinds, unless the Article's rules apply (Art 15(1) ICPNVP).

The Convention provides for a different kind of optional exception. Each contracting party may limit the breeder's rights with regard to any variety, as long as they are reasonable and protect the breeder's legitimate interests according to Article 14(5)(a)(i) or (ii) of the Convention (Art 15(2) ICPNVP). this permits farmers to plant the protected variety on their own holdings using the harvested material for propagation.

5. The Nigerian Plant Varirty Protection Act 2021

It is not entirely new in Nigeria to use plant breeding to create new plant species. Prior to 2021, Nigeria lacked an efficient institutional or regulatory framework for the defense, preservation, and enforcement of plant breeders' rights since it was not a signatory to the International Union for the Protection of New Varieties of Plants (UPOV) Convention. Due to the possibility that these links would deter foreign plant breeders from entering countries where the new plant variety could not be safeguarded, the previous approach significantly hindered the application of such rights. Additionally, it made it impossible for Nigerian plant breeders to import new, improved varieties from other nations.

In May of that year, the PVP Act 2021 was signed into law by the Nigerian President with the intention of establishing a functional framework for the protection of plant varieties in Nigeria (Federal Republic of Nigeria, 2021). After the Act was passed, Nigeria signed the 1999 International Convention for the Protection of New Varieties of Plants. The Union for the Protection of Varieties of Plants (UPOV) also recognized Nigeria's adherence to the 1991 ICPNVP, (Le Galle, 2021) and Nigeria was admitted as a member. Nigeria's dedication to changing agricultural productivity is demonstrated by the PVP Act, which also encourages international corporations to fund indigenous seed business ventures (Okonkwo *et al*., 2021).

5.1. Major Elements of the Act

The PVP Act, 2021, creates a Plant Variety Protection Office, promotes investment in crop variety development and plant breeding, and safeguards plant varieties to help Nigeria's smallholder farmers produce more staple crops. The Plant Variety Protection Office, also known as "the office," is housed

inside the National Agricultural Seeds Council (NASC). The Registrar of Plant Breeders Rights, will be in charge of managing the office and will be nominated by the NASC Board at the Director General's recommendation.

The Registrar's Office will be in charge of the following:

1. Get the breeder's approval.
2. Document and share information about the rights that Nigerian plant breeders are entitled to.
3. Permit the transfer and licensing of plant breeders' rights.
4. Collaborate with regional and international groups that address matters related to plant breeders' rights.
5. Perform additional tasks as needed to fulfill the objectives of this Act (Sec.5 PVP Act).

5.1.1. Objectives of the Act

i. Encourage Nigerian smallholder farmers to increase the productivity of their staple crops and back investments in plant breeding and crop variety research.
ii. Encourage the seed industry to be more accountable to one another.
iii. Preserve recently found plant species.

5.1.2. Plant Variety Protection Advisory Committee

The Director General appoints members of the Plant Variety Protection Advisory, an ad hoc committee established by legislation and made up of pertinent parties in the seed value chain. Among them are officials from the following organizations or associations:

a) The NASC, who shall be the chairman of the committee,
b) The Ministry of Agriculture,
c) A registered plant breeder association,
d) A registered seed traders' association,
e) A registered farmer's association,
f) A university offering a course on plant breeding,
g) The Attorney General of the Federation's office,
h) The National Office for Technology Acquisition and Promotion,
i) The National Quarantine Services,
j) The National Biotechnology Development Agency,
k) The National Biosafety Management Agency,
l) The National Crop Variety Release Committee,
m) The Registrar of Trademarks,
n) The Registrar of Patents and Designs,
o) The Registrar (Sec.9 PVP Act).

According to the Act, the aforementioned Advisory Committee is required to perform the following duties:

i) Through the DG of NASC, advise the Minister of Agriculture on how this Act should be implemented.
ii) Obtain information on plant breeders' rights applications from the registrar.
iii) Obtain the appropriate reports from the plant breeders and information about the test results from the registrar.
iv) Oversee the funds (Secs.10&11 PVP Act).

5.1.3. Varieties to be Protected

This Act provides protection for all plant species and types. The following rights will be protected:

a. A variety that is new, unique, consistent, and stable is granted the breeder's privilege.
b. No additional or different criteria will apply to the grant of a breeder's right, provided that the applicant complies with the Act's provisions, pays the required fees, and the variety is identified by a denomination in compliance with the Act's requirements (Sec.12 PVP Act).

5.1.4. Application for Plant Variety Protection Rights

The breeder of a novel variety may request the granting of their breeder's right. An application for breeder's rights should include the following: (Pt IV PVP Act)

a) Name and address of the applicant.
b) In cases where the applicant is the legitimate heir of the person who created, bred, and found the variety:

c) The registrar may accept evidence of authority or title in a format and material that the registrar deems appropriate, or as may be specified by laws proving the validity and legality of succession or assignment. The variety's breeder, discoverer, and developer's name and address.
d) The recommended denomination and a description of the variety's traits, if requested by the registrant.
e) Distributing samples of the material in any amount the registrar specifies; and e. Any additional data, records, and materials related to the application that may be needed in accordance with the Act.

5.1.5. Nullity, Cancellation and Surrender

The Act compels the Registrar to declare the breeder's right in question null and void if it is demonstrated that the variety in question did not meet the standards specified in sections 14 and 15 of the Act at the time the right was given:

a. The standards specified in section 16 of the Act were not fulfilled at the time the breeder's right was issued in situations when it was principally awarded based on information and evidence supplied by the applicant (Sections 14 & 15 have to do with the conditions for the grant of a breeder's rights).
b. The conditions specified in section 16 of the Act were not fulfilled at the time the right was issued, even though the applicant supplied the majority of the data and supporting documentation required for the breeder's right to be given.
c. The right of the breeder was given to someone who is not entitled to it since it was not transferred to the rightful owner (Sec.35(a) (b) and (c) PVP Act).

Similarly, if the Registrar determines that a breeder's right is no longer legitimate because of the conditions listed in Section 16 of the Act, the Registrar can revoke that right (Sec.36 (1) PVP Act). He also has the power to cancel a breeder's right if the right holder does not provide the information, documentation, or other materials needed to verify the variety's preservation according to the Act-made regulation's deadline (Sec.36 (2) PVP Act).

Again, the registrar will cancel any breeder's right holder who fails to pay the payments required to keep the right valid or who fails to propose an alternative denomination in the case that the variety's denomination is canceled after the right is issued (Sec.36 (2) (b) and (c) PVP Act).

A breeder's right holder may surrender any rights they may have held under the Act by notifying the Registrar in writing. Under such circumstances, the Registrar will terminate the breeder's right within a month of receiving the notification of surrender, and two national daily newspapers or the Federal Government Gazette will publish a notice of the termination (Sec.38 PVP Act).

6. Challenges of Enforcement of a Breeder's Right Under the PVP ACT, 2021

The provisions of sections 42 and 43 of the Nigeria PVP Act, 2021, which render the Minister of Agriculture's decision, acting as an appellate authority, definitive with regard to any dispute resulting from the issuance of a breeder's right, are among the Act's most glaring flaws.

Section 42 of the Act is hereby reproduced; "42(1) the minister will hear an appeal of the registrar's judgments issued under this act".

42(2) If someone feels wronged by a decision made by the registrar, they can file an appeal with the minister by sending in an appeal notice within sixty days of the individual notice of the judgment being published or received by the person whose interest is the source or subject of the appeal.

43(1) the minister:

(a) May hold an appeal hearing, carry out an inquiry if he feels it is necessary, or base his decision on written submissions.
(b) May instruct the registrar to execute his decision and may validate, overrule, or modify any decision or action taken by the registrar.
(c) Shall provide written justification for his judgment, and copies of the decision will be distributed to the registrar, the appellant, and any other interested parties.

43(2) A decision made by the Minister is final, subject to the provisions of this section.

It has been asserted that the aforementioned PVP Act provision, which permits the Minister of Agriculture's decision to be final in matters arising from the law while on appeal, is unconstitutional and in conflict with the Nigerian Constitution. This is especially true since it suggests that the court's jurisdiction to hear cases involving breeder's rights will be removed. The Constitution of the Federal Republic of Nigeria 1999 Section 4(8) stipulates:

"The exercise of legislative powers by the National Assembly or a House of Assembly shall be subject to the jurisdiction of a court of law and of judicial tribunals established by law, unless otherwise provided by this Constitution." As a result, neither the National Assembly nor the House of Assembly may pass legislation that would eliminate or purport to remove the jurisdiction of a court of law or a judicial tribunal established by law.

Since the Constitution specifically forbids the legislature from passing any legislation that would purport to remove a court of law's jurisdiction, except as allowed by the Constitution, the above provision's unambiguous wording confirmed constitutional supremacy over statutory provisions, particularly those that contain ouster clauses.

Thus, the Court determined in Inakoju v Adeleke (2007), that:

"Ouster clauses are typically seen as the antithesis of democracy since the legal system finds them strange and unwelcoming. Section 6 of the Constitution is used by the courts as a metric to assess whether or not Acts that contain ouster clauses are lawful."

Because section 43(2) of the PVP Act's legitimacy is tied to the Constitution's constituency, it is safe to say that in certain circumstances, the appeals system established under both provisions may not meet this crucial criterion for validity and will be void to the degree of its inconsistency. In any event, if section 43(2) is subjudice, the court will not abdicate its jurisdiction because it will determine that the provision is unconstitutional and goes beyond the legislative branch's authority (Okonkwo *et al*., 2021).

It has been pointed out that by avoiding the drawn-out and difficult litigation process, section 43(2) may offer a business-friendly environment in which parties can quickly settle their disagreements by the minister in its appellate role from the decision presented to it by the Registrar. It is nevertheless true, though, that the process is illegal and that it cannot effectively prevent parties from considering court appeals when necessary.

Therefore, notwithstanding the difficulties associated with litigation, the Minister's office is not the appropriate avenue for conclusively settling disagreements between parties about the determination of their rights and obligations (Okonkwo *et al*., 2021).

In addition Okonkwo *et al*. (2021). suggested in their study that section 43(2) of the PVP Act be changed to specifically accept appeals to the court from the registrar's judgment rather than appeals to the Minister in order to stop this from being contested. This guarantees that these disagreements are heard in the appropriate forum, which may increase stakeholders' trust in the Act's established conflict resolution procedures. Alternatively, the act might be changed to establish an Arbitration Tribunal that would hear appeals of the registrar's ruling. Likewise, additional appeals from the tribunal's ruling would be brought before the court in line with this Constitution's provisions (Okonkwo *et al*., 2021).

7. Impact of the Nigerian PVP Act 2021

The PVP Act gives plant breeders who have developed new and improved seeds for increased crop yields legal intellectual property rights, which is one of its main conclusions. According to an industry source, the PVP Act is anticipated to help the country move from manufacturing zero dollars from seed exports to well over $2.0 billion USD during the first few years of the law's implementation. By 2050, Nigeria's population is expected to double to 400 million, hence it is imperative that strategic investment in the country's agriculture be increased. By solving the current problem of farmers yielding an unacceptably low yield per hectare, the Act would reassure and reassure investors in the seed industry and breeders to make investments in Nigeria (Bolowade, 2021). The Act's operationalization will undoubtedly increase investment in the seed industry, generating well-paying jobs, particularly in rural regions, and making a significant contribution to Nigeria's GDP (Bolowade, 2021).

The Act creates a foundation for plant variety protection in Nigeria and provides breeders who produced these varieties with recognition and just remuneration. The Act enables innovation in agricultural research, which in turn fosters collaborations among relevant agricultural businesses to provide value to the sector and creates a competitive agricultural sector.

8. Conclusion

The PVP Act's passage was influenced by the Nigerian agricultural sector's integration. The Act will undoubtedly be a game changer because the nation wants to increase its economy through agricultural value chains in order to increase food security. It is asserted that the legal framework and administrative structure of the Act will stimulate the private sector to develop innovative and creative types.

9. Recommendations

In light of the Act's encouraging effects, we advise

(a) that all efforts should be made to ensure that the Act's provisions are properly carried out and its lessons are operationalized in the field of agriculture and food productivity in Nigeria.
(b) that partnerships at all levels of government, both domestically and abroad, be implemented in order to increase the Act's aspiration's realization. The Regulation to be issued in accordance with the Act should include provisions for structured funding to encourage additional research and enhancement of plant breeding by local farmers.
(c) Lastly, to highlight the realization of the Act's intent, information on plant breeding and awareness-raising through vetted channels should be shared with stakeholders in pertinent sectors. This would encourage inclusivity among all agricultural stakeholders and facilitate the widespread application of the Act's provisions.

Conflict of Interest

The author declares that there is no conflict of interest.

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