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Impact of Climate Change - Intellectual Property Rights in the Agricultural Sector

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ABSTRACT

Climate change has been a severe issue for a quite a while now and has now become a haunting reality.There have been reports and predictions regarding the changes in patterns of weather which would result in decline in production of food, rise in sea level resulting in floods. There have been reports and future predictions of changes in patterns of weather that decline the production of food, to sea level increase that might lead to floods. The effects of climate change affect the world as a whole and can get out of control in no time. However, the most vulnerable sector to climate risk is agriculture.Climate change will also affect the agricultural sector and the entire farming procedure, leading to major consequences in the economical sector too. The contribution of agriculture in employment of Indian population is 58% and in GDP is 15%.

The paper to achieve the purpose would do so in broadly there folds. Firstly the paper strives to showcase the various reasons associated to the climate change and its direct impact on agricultural sector, primarily on farmer's rights. To do so, it would take help of the aspects of the conferences involved to discuss the climate change and its relation to economic growth. Indian legislature has passed the Farmers' Produce Trade and Commerce (Promotion and Facilitation) Bill, 2020 & The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Bill, 2020. The analysis of this Bill would be made further in the paper as I would enable the farmers to trade cross border and empower them to market their own manufactured produces. The paper would further discuss how with an increasing population and impact of climate change, there is now a greater need of adopting new technologies to mitigate the impact especially by adopting genetically modified organisms (GMO) and other patent-able inventions. Secondly, the scope of the paper stretches out to how the technology plays the pivotal role in the public domain to curb this persisting issue. The New-Age agriculture is heavily relying on smart work and efficiency. There has to be room for more specific invention of technologies catering to agriculture solely. The third fold would also highlight how the traditional knowledge stands in conflict with the rights of local people and how these

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issues can be balanced. The authors will analyze a few successful case studies to understand different strategies adopted by farmers to boost their production.

The paper conclusively discusses the future scenario of the climate change impact. The paper will highlight the need of land for agriculture in addition to sustainable development is essential for increment in worldwide food creation which will need to originate from intense farming practices and mechanisms to boost agricultural production with the help of relevantt intellectual property laws.

Keywords: *Climate change, Intellectual Property Rights, Farmer's Bill 2020, Agriculture.*

I. INTRODUCTION

As the wonder of environmental change has started to disturb our everyday lives in a phenomenal manner, which the world has not seen before various areas of industry are additionally being influenced in an extraordinary way as they can't appear to handle this worldwide issue any in a way that is better than any other person. The issues looked by the world through environmental change these days are progressively increasing and more risky consistently and many individuals accept that this has been welcomed on by the obliviousness of the people themselves. All the antagonistic impacts of environmental change are turning out to be all the more glaring and more cataclysmic to mankind over the long haul and this can't be overlooked and treated in such a trifling way any longer. We have to notice the threats presented by environmental change which have been alarmingly expanding and continue expanding right now and besides act in a way significantly more capable and substantially more careful than previously on the off chance that we are to check or stop the impacts of this consistently developing issue which will inevitably bring about the decimation of the planet earth as we probably am aware it and everything and everybody on it[4]. Our point is to cover the effect of environmental change : Intellectual Property Rights in the Agricultural area. As referenced before nobody area is sheltered from the effect of environmental change on the planet as this wonder influences the globe overall and doesn't give kindness to any part of any legislature as its effect can be felt on each area possible. The rural area is no special case to this point and has been profoundly and straightforwardly affected by the unfavorable impacts of the worldwide marvel of environmental change and there are likewise some sure effects of environmental change brought about by an Earth-wide temperature boost which are the increment in crop profitability because of treatment impact brought about by the increment in

[4] https://blog.agrivi.com/post/climate-change-impacts-on-agriculture

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carbon dioxide fixation in the climate, development of the zones accessible for creation of tropical as well as subtropical yields[5]. However, this doesn't detract from the way that the marvel of environmental change has without a doubt accomplished more awful than great to our planet. Environmental changes are mostly likely to affect food security at worldwide, local and nearby levels. It can influence food quality and decrease accessibility to food altogether. For instance, extended increase in temperatures, changes in extraordinary climate functions and precipitation pattern and decrease in accessibility of water may together bring about diminished agrarian efficiency. Recurring growth in hideous climatic functions can become an obstruction in food conveyance resulting in upward spike in food costs after extraordinary functions are relied upon to be more successive later on.

Change in climate and agriculture are cycles which are interlinked with one another, and they are prevalent in a global scale. Changes in climate and environmentaffectfarming and agriculture in differentways, integrating through changes in normal temperatures, precipitation, and atmosphere boundaries, changes in bugs and sicknesses, changes in air carbon dioxide and ground-level ozone fixations, changes in the dietary nature of certain nourishments and changes in ocean level.

Changes in temperatures and climate are curentlyaffecting horticulture, with effectsraggedly dispersed around the globe. Environmental fluctuation in the future will probably converselyaffect crop creation in low scope nations, althougheffects in northern scopes might be positive or negative. Adverse changes to the environment will surelyincrease the risk of food shortage for the less privileged, for example, poor people. For instance, South America mightbe deprived of 1–21% of its cultivable land area, Africa 1–18%, Europe 11–17%, and India 20–40%. [6]

The rapid increase in environmental change, followed by worldwide populace and pay development, undermines food security all over. Agribusiness is powerless against environmental change. The risk of increasing temperatures in due course of time reduce the yield of impressive harvests while allowing weed and increased nuisance[7]. Heat waves can cause outrageous warmth stress in crops, which can limit yields on the slight chance that they happen during specific occasions of the plants' life-cycle (fertilization, case or organic product set). Likewise, heat waves can lead to being the cause of withered plants which can lead to a blow in become obstruction to crops and the soil structure as well. A majority of plants can

[5] https://www.futurelearn.com/courses/climate-smart-agriculture/0/steps/26565
[6] https://royalsocietypublishing.org/doi/10.1098/rstb.2010.0158
[7] https://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-agriculture-and-food-supply

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survive in slow waterlogged conditions as their roots can't loosen up enough. The general effects of environmental change on cultivating are relied upon to be negative, compromising worldwide food security.

As the whole world continues doing combating with the worldwide marvel of environmental change there is minimal left to the creative mind as we are seeing all the risky impacts of environmental change unfurling before our very eyes and in the event that we people don't all things considered work towards the advancement of these issues the outcomes will be disastrous without a sad remnant of an uncertainty.

II. GENETICALLY MODIFIED ORGANISMS (GMOS)

Genetically modified crops are in commercial use now for over a period of 10 years. The studies of these crops have shown that they have been beneficial for farmers and consumers as they are pest-resistant and the nutritional values can be enhanced helping in production of large aggregate welfare gains as well as having a positive effect on human health and environment. GM crops can significantly contribute to the global food security and poverty reduction given that it gets a good institutional framework in the future. It has also got its fair share of hate which has caused a very complicated system of set of laws around it. The use and development of GM crops have been facing a threat due to these overregulated laws imposed on it. Developing countries may make inevitable benefits by the use of these crops while making a great sustainable growth for the future. There needs to proper economic research in evaluating the growth of GMOs and its future with efficient regulatory mechanism and innovations in the agricultural sector as well.

Following are the pros and cons of GMOs:

(A) Pros

- GMOs can are helpful in producing modified crops with more nutritional value than normal crops; they can grow quicker and yield more than regular crops as well while being more defiant to pesticide.

- It had been observed that by implanting artificial DNA in these crops from different species can save a lot many years of. Traditional breeding methods can take decades with unpredictable results before reaching the required equilibrium. GMO can eliminate that long wait by achieving the required goal instantaneously.

- Practicing of GM crops have been there for over a decade now so if there would have been any major concerns related to the impact of these crops on human health then it would

have been evident by now.

(B) Cons

- Studies have been conducted which showed that rats where fed GM corns and soy which lead them to develop a higher risk of liver and kidney. While the same may not be applicable to human but still leaves an uncertainty for the nature of GMOs on living things.
- There are times when GMOs are not tested thoroughly, with a period of 90 days being the shortest testing time, which is feared by many people to be not enough to determine all threats and risks it poses.
- Transgenic modification results in invention of organisms which are highly unlikely to generate by natural means, making their nature to be highly unpredictable.
- GMOs were initially developed to minimize the consumption of pesticides used on crops, while has been observed that farmers tend to use more of it as weeds and bacteria become resistant to it. Testing of GMOs has also been criticized on the grounds that it involved experimentations on animals, which people counts as a breach of animal rights.

(C) GMO in India

Genetic modification is still a debatable concept in India just like the rest of the world where many debates have been presented in both for and against the technology. Considering the challenges India has in terms of its population growth which is about 1.38 billion people and the fact that two-third of its population's livelihood is dependent upon the farming and agricultural sector. It should also be noted that India's rank in the 2020 Global Hunger Index (GHI) is 94 out of 107 countries. Considering the given statistics it is very likely to say that GMOs can be a solutio0n to India in reducing its hunger issue while providing better produce to its people working in the farming sector and maintaining a sustainable growth.

While this leaves a wide scope for the people of India to try and harvest more of these genetically modified crops, the lacks of proper intellectual property law in the country can be a barrier in going forward with the idea for the near future.

III. USE OF TECHNOLOGY AND RESOURCES IN PUBLIC DOMAIN

While the rapid advancement in technology and growth in industries may have contributed to the climate change, the same technology can also help the fight against climate change. The technology adaption can help agricultural sector in many ways in fight against climate change. Specially the technology and other resources that are available in public domain. There are some technologies which patent has expired. So it is available to use without infringement.

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Similarly there are resources that are available for public, which can be used. There are large amount of both technology and resources in public domain, which a developing nation can use to reduce the impact of climate change. Like in the case of resources the photographs provided by NASA are available to public for free to use. These photographs and other data provided by NASA can be used to study patter of change in whether in a place and the local community can be prepared for it better. While these resources available in public domain is easily accessible, the access for technology whose patent is expired is difficult. Even if someone has access to it, they don't have the technical know how to use it in practical field. This issue can be solved by help from various international bodies like IMF or developed countries. The country where the original patent was filed can teach the use of the expired patented technology to the developing countries where the technology is required. Another thing that can be done is clean energy and climate change tech developed by Public institution funded by government should make their patents free for public to use. The Department of science and technology of India invest into developing climate change solution every year through funding research and development in various public institution. In the year 2018-19 alone, the department supported 32 projects[8] related to climate change. The technology developed from this research and development should be available for public for free instead of licensing some particular organization for a royalty fees. This way the local companies will get access to the technology and in later stage they will invest in their own Research and development programme to develop new technology.

IV. FARMERS RIGHT

The agricultural sector is the most impacted sector by Climate change. In developing countries like India, Nigeria, Bhutan etc where a majority percentage of farmers are poor, climate change is making the situation worse. At a time when the global food security is under incredible pressure from the fast growing population, climate change is damaging the very foundation for a secure future of the new world by impacting agriculture sector. But at a time like this, the increasing corporate control over seed genetic diversity, supply chain and pricing is making a dent on farmers' right, which is making the fight against climate change harder. Even before the the impact of climate change was visible, the farmers' right is nearly non existent in developing countries like India, Nigeria, Bhutan etc. This may be the result of farmers' illiteracy about their rights or non existent legislation in the country.

Breeding of stress resistant varieties of seeds, genetic engineering, adoption of new technology,

[8] https://dst.gov.in/sites/default/files/Year%20wise%20Projects%20CCP%202018-19.pdf

sharing of existing traditional knowledge and method are useful method to fight against climate change for agricultural sector. For all these there is an need to increase private investment. The Intellectual property laws like The Protection of Plant Varieties and Farmers' Rights Act, 2001 is one such law to promote private investment in research and development of new varieties of seeds. The international protection agreement for IP known as TRIPS which is signed by all member countries of WTO, authorizes a mandatory domestic legislation[9] to grant protection for any kind of innovation including plant varieties and farmers' right by adopting the UPOV act or a effective sui generis system of protection. While what will be the minimum requirement of this sui generis system is not specified, most countries adopt the 1991 version of UPOV act. This is partly because of the free trade agreement(FTAs) like RCEP or with US or EU specifies the use of UPOV in the deal. These legislation promoted innovation in seeds which resulted in development of many new varieties of better seeds which can be adopted to climate change. It resulted in increase in number of patents filed for seed's ability to survive drought, flood, low light, high light, nutrient unavailability, high heat and cold, freezing temperature etc in developed countries like US. The increase in these climate change ready seeds can be attributed to these new law introduced.

Access to climate ready seeds- In India. because of climate change, the location where water is available for year long and average temperature over the year was below 20 degree c, is now facing temperature far more than that. It is resulting in less yield that year. Every year even 1 degree change in temperature is resulting[10] in lesser yield that year. In these locations, the heat resistant version of that seeds can be used in place of traditional seed, which will help in mitigating the impact of higher temperature. So it is the right of farmers' to get access at affordable and in required quantity of these seeds at their disposal.

Protection of traditional seed varieties- It is the right of farmers that the traditional varieties used by them is protected by law. The farmer have produced corps for thousands of year. The varieties used by them have evolved over the year and some of them are better adopted to climate change because of evolution over generation. The farmer and the local community should be granted protection for that breed or genetic variety. Even the method used by them in respective climatic conditions should be protected. In a hot climatic condition, farmers use techniques which can result in better yield.

Protection of Traditional knowledge- Contribution of traditional knowledge in developing

[9] http://www.fao.org/3/y5714e/y5714e03.htm
[10] https://www.livemint.com/Politics/Pr200sqEC2AzkES4gqj4uI/How-farmers-in-India-are-adapting-to-climate-change.html

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farming practices in a locality is very big. The traditional knowledge like local climatic condition and how to overcome it, can be used to develop climate resistant crops. Like in Rajasthan, because of lack of water, the traditional community uses methods which consume least water while securing[11] sufficient yield. This can be replicated in other areas where drought like situation arise. Not only seed variety but also the storage method can be implemented in case to case basis. The commercial value of these traditional knowledge used by local and indigenous community is very difficult to measure. Over the year, only these traditional knowledge kept the farming in the locality alive in the face of many adversity. So there is a need to protect these traditional knowledge under IP law for the benefit of local community. The WIPO Intergovernmental committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore, had published two draft on protecting these knowledge on September 28th, 2018. The first draft contain provisions[12] to protect traditional knowledge through national law system.

(A) Access Benefit sharing

One of the important aspects of protecting farmers' right is to give them benefit for the product sourced from them. In many case the product developed by a business is derived from another source. The local communities have spent a considerable time and energy in protecting the traditional genetic resources. It is the duty of the person who require the genetic resources to pay fair compensation for it. In India, it is duty of the the acquirer of protected genetic resources to pay fare share of commercial gains to local community where the product is sourced. Under the PPVFR act, it also compulsory for the user to disclose all information about genetic product used including how the material is sourced.

(B) Full disclosure and Compensation

The seeds sold by the Multinationals companies in the name of so called climate ready seeds should contain all information like the yield that can be harvested in the season, the spacial qualities of the seeds, whether it can be used in a particular climatic conditions etc. While not meeting the advertised facts, should result in compensation to farmers. If a farmer is trusting the newly advertised seeds as a solution to current problems, then the advertised seeds need to stand up to that. Otherwise the farmers may not adopt the new varieties of seed and may continue use old seeds. This can be prevented if the seed developer will pay compensation to

[11] Bhati, Tej & Kumar, Shalander & Haileslassie, Amare & Whitbread, Anthony. (2018). Assessment of Agricultural Technologies for Dryland Systems in South Asia: A Case Study of Western Rajasthan, India.
[12] https://www.wipo.int/edocs/mdocs/tk/en/wipo_grtkf_ic_38/wipo_grtkf_ic_38_4.docx

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the farmers in case of any mishap because of failure of those seeds.

(C) Government schemes

To encourage the fight against climate change in agricultural sector, the government need to raise awareness about the farmers' right available and do capacity building of farmer by other scheme. Many farmers' are unaware about their rights.

V. CLIMATE CHANGE AND ECONOMY

In IPR, a lot of aspects should be considered in order to grow economically and maintain sustainability. Climate change is one of them. Talking and addressing this problem is one of the major challenges faced globally in this century. It is not a new discovery, it is a constant process. But the changes now are rapid and deteriorating.

Climate change is not a threat to just the human race, it is a threat to the economy. It affects the agricultural field and this problem persists all over the world. The climatic extremes, rising of sea levels, changes in the ozone layer, frequent changes in temperature is a result of burning fossil fuels. These factors are having a direct impact on decreasing plant productivity. An increase in heat waves (global warming) is reducing productivity and labor; which results in high prices for agricultural crops. And eventually, prices would increase for popular crops like Rice, Wheat, Maize, and Soybean. There would be a considerable fall in cereal consumption which shall result in greater food insecurity. As productivity takes a hit, there will be a shortage of products in the market resulting in inflation.

By stating these above-mentioned points, Climate change directly has an impact on the economy not only the agriculture sector is affected, the infrastructure sector as well. It affected growth and inflation. Global warming is affecting the infrastructure globally and hence results in less productivity and economic loss.

To avoid the rapid change in climate and the impact it has on the economy, we need to predict and adapt. Considering all the social and economical factors including population and carbon emission, experts have come up with "Climatic Scenarios". These Climatic Scenarios will exhibit the power of different behavior to change climatic patterns like temperature, productions, seasonal productions.

Natural calamities are causing agricultural problems and pushing people to poverty by destroying their livelihood. Lack of rainfall is inventing drought farm fields resulting in less productivity. World Bank says if actions are not taken immediately, this problem can force and push people to poverty by 2030.

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The countries that are affected the most are South Asian countries like India and several countries in Africa where constantly the temperature is rising, water and sea levels are out of control and the intense cyclones.

(A) Here's how farmers can deal with this destructive threat:

Climate change is also affecting rainfall and sea levels. And with the increase in temperature, water availability for farming has deteriorated. So by anticipating these problems in the future, farmers are now coming up with new types of crops that are drought tolerant and adaptable to the changing conditions. Farmers are also taking steps for efficient irrigation and conserving water for future possibilities.

The most discussed and popular opinion on this problem is to trap all the greenhouse gas emissions for better productivity in the agricultural field. And to RENEW all the energy used before like burning of excessive fossil fuels to on-farm renewable energy like solar panels, windmills, reduction of pesticides to better input in production and storage.

Thirdly, to inculcate organic farming rather than conventional and industrial farming which would help in the reduction of harmful gas emissions like GHG, and make way for cleaner soil, water, and the output- food. This step will largely affect productivity and maintain sustainability.

Furthermore, to create awareness among the farmers about these efficient steps and help them by supporting local food and market. This will keep the farming process feasible and sustainable.

VI. TRADITIONAL KNOWLEDGE AND FARMER'S RIGHT

Traditional Knowledge (TK) are acquired skills and practiced which are passed on from generation to genration and are performed as customs within a specific community. It becomes the part of a community's spiritual and cultural identity. Traditional Knowledge can be found in various aspects including: agricultural, scientific, ecological, medicinal as well as biodiversity related.

WIPO in the year 2000 gave Traditional Knowledge a proper legal protection. This also gave protection mechanism to genetic resources which includes GMO's and also traditional cultural expressions (folklore).

The value of Traditional Knowledge cannot only be justified by its age old practise or customs but also because it is an on-going and living body of knowledge which accounts for many practices catering to agricultural growth upon which the economy is heavily dependent. Current

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IPR laws are not sufficient to protect these practices and stricter provisions are required to help the farmers to deal with any form of deprivation. The protection would not only serve the farmers but also would be helpful in preserving many traditional remedies and indigenous art forms from commercial exploitation.

(A) The protection mechanisms can be broadly divided into 2 categories:

1. Defensive Protection

It focuses more on preventing the other communities from claiming for intellectual property rights over their traditional knowledge. For example India has the mechanism of Traditional Knowledge Digital Library (TKDL) which a database and has compilation of all forms of searchable traditional knowledge to prevent any form of overlapping of claims. It is also used for prior art search as an evidence by patent examiners. In the US, the US Patent and Trademark Office had granted a patent to turmeric for healing wounds. In such cases this mechanism comes to the rescue.[13]

2. Positive Protection

This protection is basically granting rights to give power to communities to encourage their own traditional knowledge and prevent it from being commercially exploited by other communities. This system can also help in protecting wide variety of communities including indigenous and local communities.

3. Protection of Traditional Agricultural Knowledge and Farmer's Rights

India as a country has been forever known to be deriving majority of its economical growth from the agricultural sector. The fact that farming and agricultural practises has been an age old work in our country gives us many insights of all the traditional knowledge associated to it. Most of the credit can be given to the customary management of crops by farmers itself. One method to negotiate with resource providers through payment is an alternative, which is an bioprospecting contract.

Such bioprospecting mechanism refers to a deviation from the customary treatment and essentially deals with the change in crop genetics resources adhering to guidelines of Convention on Biological Diversity (CBD). There has to a harmonious balance between preserving the age old traditional mechanism of farming as well as promoting the innovative process of bioprospecting methodologies. The ground rule for doing so lies in establishing such a benefit-sharing protocol that the farmer's rights are not only recognised but also uplifted and

[13] Britta Rubert."Contested Properties", Transcript Verlag, 2020

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the traditional knowledge of agricultural practises is also retained. This must take into account the recommendation for meeting the Framer's rights mandate for the International Treaty on the Plant Genetic Resources on Food and Agriculture.[14]

(D) Traditional Knowledge of Indigenous people in climate change

Climate change affects every strata of the society all over the world. But the one's who are mostly the victims are only the one's who are least equipped to. The indigenous people are the most vulnerable yet the most traditionally knowledgeable people.

Indigenous people are known to be the world's "advanced guard" of climate change. Despite being depicted as victims of poverty and climate change, it has to be pertinent to notice that their resilience and adaptive capacity towards harsh climate change is commendable. Indigenous people's knowledge can certainly provide insights into observation and mitigation of climate change consequences.

(E) Conceptual Framework of traditional knowledge, genetic resources and farmer's rights

There has been a constant debate of difference between traditional knowledge and scientific propositions. But there are also many aspects which show that most elements of a traditional practise has a scientific validation. A farmer when sowing a seed, takes into consideration various factors such as soil, moisture, temperature and meteorological conditions. A specific calculation of all the factors gives ton a specific result. This includes a level of scientific knowledge as well. Traditional knowledge protection cannot be barred on the grounds of it being only a communal practise or custom when many insights show evidence if it involving scientific and analytical knowledge too. In such a case, access to genetic resources by a farmer becomes equally important to that of any scientist to its equipments.

When discontinuity in a tradition happens in any community, it gives rise to a transformation. Similarly when introduction of a new crop done or invented in any market through the process of budding or grafting, it gives rise to an innovation. The essence in mentioning this is to make it certain that a system has to be made such that a harmonious establishment is made between GMO and traditional knowledge of farmers to uplift both.

(F) Contested domains of local/traditional knowledge

Knowledge erosion and resource erosion threats go hand in hand. The reasons are very obvious. Although it is true that the knowledge of formal scientific idea of plants is rich, the base upon

[14] www.capri.cgiar.org

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which the knowledge of communities of different regions is organised is also very diverse.

(G) Important assumptions behind this concept[15]

First, not all knowledge is communal in nature. There are many individuals who have great expertise in certain fields of local traditional knowledge.

Second, not all knowledge is traditional in nature but many of them are also contemporary innovations either collectively or individually.

Third, sustainable conservation of local knowledge can be done effectively if ethical and spiritual values associated with it is also protected and retained.

Sustainable and dynamic conservation can be done not just by retaining the traditional knowledge as historical heritage but by promoting and encouraging more innovations by acknowledging the traditional practises. Such conservation process should be flexible and dynamic in nature.

VII. IMPACT OF IPR IN THE PLANT/SEED INDUSTRY

Recent developments in biotechnology has given rise to new difficulties for the patent system which help in mending new laws and regulations and has given birth to never existing before IP rights. Basically the inventors get their monopoly right for their invention and in exchange of that the they reveal the steps behind their invention which assists the people in general by encouraging combined creation meanwhile forcing an expense on the organization from uncovering their mysteries.

The current outstanding development in biotechnological research is a result of change in innovation and accessibility of protected innovation property rights for living life forms. The new perspective in biotechnology protecting licensing began after the Supreme Court's landmark case - Jewel v. Chakrabarty[16] where it was provided to permit the protecting of living life forms. After this decision the plants and animals were protected as standard utility patent. For the plant seeds, the PVPA and for plants tubular in structure the PPA was already set up much before the landmark case.

The biotechnology firms were left with ample amount of options in plant property rights to choose with due to the decisions of the court and few conversions in the government policies.

The seed firms can apply for a utility patent or maybe a PVPA or for both.

[15] www.maharashtra.gov.in
[16] 447 U.S. 303,100 S. Ct. 2204; 65 303,100 S. Ct. 2204; 65 L. Ed. 2d L. Ed. 2d 144; 1980 144; 1980 U.S. LEXIS 112; 206 112; 206 U.S.P.Q. U.S.P.Q. (BNA) 193

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A model by Hopenhayn and Mitchell (2001) recommends that such ample amount of options in plant property rights to choose for protecting can way to vital patenting behaviour by firms in waving a path to socially problematic interests in IP rights. New property rights additionally infer expanded vulnerability in the translation of laws. In a powerful situation like this where laws and translations are evolving quickly, there should licensing choices that needs to be chose vitally by the firms, with the end goal that they can remove most extreme rents from their privileges.

Below mentioned cases provide the most important court decisions on patent protection of plant[17]

1. Diamond v. Chakrabarty in 1980

- Here Supreme Court held that, under US Patent Statutes the genetically modified bacteria can be patented.

2. ex-parte Hibberd in 1985

- Here a utility patent application for a kind of corn seed was presented where board of appeals of patent office said that the case of Chakrabarty applied to plants but utility rules have more significant principles for novelty and utility rather than the PVPA and no exemptions for researchers and farmers, with the end goal that neither a farmer can save seeds for replanting nor researchers can use it without utility license. After the changes in 1985 the plant seed makers had two strategies to ensure protection by

i. A PVP

ii. A PUP

Or apply for both.

J.E.M. Ag Supply v. Pioneer Hi-Bred International in 2000

-held that simultaneous protection under the utility patent statutes and the PVPA were subtle.

This set of experiences of protected innovation rights has made various systems for plant seed makers. The primary system which went on until 1970 had no accessible IPR aside from keeping organization's mysteries. After 1970 they were left with no choice other than put in for PVPs for their seed assortments.

In 1985 utility patents were added to the property rights portfolio, however some security risk

[17]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/616256/gazette-/gazette-0517.pdf,0517.pdf

as to their legitimacy when simultaneous applied with PVP. By 2001 this vulnerability got settled with plant/seed firms ready to utilize ample amount of options to choose to ensure frosts to secure their advancements in their technologies[18]

(A) Linkage between how traditional knowledge is used to cope up with climate change in Northwestern region of India

Dry atmosphere and continuous natural calamities like draught make the northwestern region of India to develop abilities for better usage of scars water resources. Skills such as development pf ponds, nadi, johad and so forth which holds water when it rains and gives supply all year as well as help in refill water tables. All these structure forestalls downpour water from running off, permitting water to permeate into the ground, energizing water springs and improve water equilibrium of the earth. The knowledge of using of all these water assortment structures comes from traditional knowledge carried by ancestors in India. These structures have stood the trial of time and splendidly withstood the rainfall. As it is notable that north-western dry India is also additionally helpless against abrupt floods which causes lot of damage to water stresses dry eco-framework. In situation like these Johad and other customary water bodies can play a explicit function in gathering surplus water which can cause flood. Aside from water bodies each customary family in northwestern India (particularly in Rajasthan and Gujarat) have a component for - Rooftop Water Harvesting which helps in storing water while heavy rainfall. Rainwater can be gathered in a water structure known as 'Hooad', these can be seen mostly in northwestern regions.

The present science additionally acknowledges that rooftop water reaping is the most logical approach to handle water related pressure but also the conventional water collecting framework in the northwestern region can be adjusted by using proper techniques.

VIII. CONFERENCES

(A) United Nations Framework Convention on Climate Change (UNFCCC)

The United Nations Framework Convention on Climate Change is an International Environmental Treaty that hopes to decrease barometrical concentrations of ozone hurting substances with the purpose of hindering hazardous anthropogenic obstacles with the world's atmosphere system.

Since the UNFCCC 1992 commanded innovation move duties, how to satisfy the

[18] Geoff Tansey, Trade, Intellectual Property, Food and Biodiversity, A Discussion Paper, Quaker Peace an odiversity, A Discussion Paper, Quaker Peace and Service London (1999)

responsibilities and adequately encourage the global exchange of climate-accommodating innovation in actuality has been the subject of discussion. In principle, climate change policymakers give an expansive system to innovation move through the UNFCCC system. The 2015 Paris Agreement submits the Parties to fortifying participation on climate innovation. Practically speaking, in any case, the dynamic exchange of these advances on a worldwide scale doesn't happen sufficiently quick to arrive at the maximum capacity needed by the UNFCCC. This deficiency is incompletely because of intellectual property rights, which represent a huge snag to brisk and proficient innovation move. Intellectual property laws expected to advance open, moderate and versatile innovation moves and to help get ready host nations for conceivably required emanation decreases in the post-Paris period.

(B) Intergovernmental Panel on Climate Change (IPCC)

The Intergovernmental Panel on Climate Change (IPCC) is an intergovernmental body of the United Nations that is given to outfitting the world with an objective, consistent information appropriate to understanding the coherent reason of the peril of human-affected ecological change, its customary, political, and financial impacts and risks, and possible response options.

The most recent United Nations report on climate change offers guidance for global and public intellectual property policies identifying with climate change moderation innovation. Albeit solid IP rights may encourage green innovation advancement and move in created nations, there is an absence of proof to help IP reinforcing in agricultural nations, it closes. The Intergovernmental Panel of Climate Change (IPCC) part governments acknowledged the third and last Working Group Report on "Climate Change 2014: Mitigation of Climate Change" a week ago on 12 April. The IPCC was made by the World Meteorological Organization (WMO) and United Nations Environment Program (UNEP) in 1988.

The report concludes “it would be possible, using a wide array of technological measures and changes in behaviour, to limit the increase in global mean temperature to two degrees Celsius above pre-industrial levels. However, only major institutional and technological change will give a better than even chance that global warming will not exceed this threshold,” according to the press release. The report calls for international agreements on “knowledge sharing, coordinated or joint research and development of climate-change-mitigating technologies, technology transfer, and technology deployment policies.” “Trade barriers and obligations regarding intellectual property (IP) rights of ‘green technology’ as well as many other WTO obligations impinge on climate policy,” it says.

(C) WIPO’s Global Challenges program works

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The WIPO Global Challenges Program tends to the advancement and intellectual property at the nexus of interconnected worldwide issues, specifically worldwide wellbeing, climate change, and, less significantly, food security.

The selection of needs reflects both the focal point of part states (e.g., in the post-2015 Development Agenda) and the potential for advancement driven answers to conveying substantial outcomes. All things considered, the Program doesn't manage meaningful intellectual property issues of specialized nature. Notwithstanding, crafted by the program might be important for meaningful conversations since it can give foundation data and strategy uphold.

i. Facilitating WIPO GREEN - a multi-partner stage that expects to promote development and dispersion of green technologies.
ii. Providing fact-based information and objective analysis of relevant intellectual property issues to facilitate international policy dialogue.
iii. Contributing IP expertise to UN and other public policy fora where IP and innovation are discussed in relation to climate change.

(D) Worldwide Challenges Division

The Global Challenges Division is liable for tending to development and IP at the nexus of interconnected worldwide issues, specifically worldwide wellbeing, climate change and food security.

These three branches of knowledge have been picked on the grounds that non-industrial nations face especially intense difficulties in these spaces and on the grounds that arrangements from advancement driven activities are plausible. The Division is essential for the Department for Traditional Knowledge and Global Challenges.

IX. FUTURE SCENARIOS

Accoring to The Hindu “With the erupt of COVID-19, there are a couple of advancements. All of these advancements may be the subject of patent applications around the world. It will be a few years before patents are even surrendered. In any case, disintegration starting at now exists among various accomplices. For instance, one country made undertakings to procure specific rights to a counter acting agent being made. On the other hand, there are in like manner composed endeavors happening. In any case, the spirit of network situated courses of action is simply on the metal forger's iron. The request that develops is whether the particularity that is seen by patent rights will be obstructing society. Will patents make blockades or is there an

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answer?

One procedure by which mixture and dispersal of innovative things can be ensured is by making a patent pool. Patent pools are normally convincing in conglomerating, managing, and licensing patents related to unequivocal domains of advancement. Such pools are ordinarily administered by a central association and the patents which become some bit of the pool are expeditiously made open for licensing. A couple of pools even disseminate the power rates payable for such licenses. Any person who wishes to procure a license will have the choice to push toward the pool, agree to the terms, and begin to create and sell the things. Such pools are dominating in, for instance, standard fundamental patents related to telecom and electronic progressions.

Creation of a pool and brief licensing will ensure that there are a few makers over the world. Appropriately, antibodies and medications will be quickly available. Some bit of the eminences could then be administered to patent owners on an intermittent reason and some part could be held to finance further assessment to oversee such pandemics in future."[19]

X. CONCLUSION

This discussion has just a single exercise, which is an end product of the exercise learned in the event of organization of enlisted surviving assortments through delicate and additionally cross-licenses. The current quality of the public examination framework in the turn of events furthermore, business use in veterinary applications needs to be opportune solidified and further created. This endeavor to analyze issues on IPR in the field of horticulture may give an underlying plan to people having conventional aptitude in the craftsmanship to turn out to be more IPR viable with their examination approach. It is very clear that India, albeit adequately meets the homegrown the necessity of creature immunizations has not been on the worldwide guide of licensing movement in creature antibody also, symptomatic fields. In any case, the previous initiative in conventional items in the chose fields must be kept up through cognizant endeavors in the present serious time, under the IPR system.

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[19] https://www.thehindu.com/opinion/lead/needed-a-pandemic-patent-pool/article31475628.ece