How can international legal rules and institutions improve aspects of the global response to pandemic disease and climate change?

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Abstract: *This paper examines the role of existing and future international laws and international organizations in mitigating climate change and pandemic disease issues. Both of these issues are urgent and significant sustainable development goals. A carbon market is a practical approach reformed by the Paris Agreement that helps climate mitigation, especially in developing countries. Available evidence concludes that adversity in biodiversity and climate change forms a vicious circle that lacks international cooperation, and the paper proposes solutions. Vaccination is at the center of discussion as the Covid-19 pandemic raises global awareness of public health issues. Organizations are expected to be more effective and better provide access to the vaccine for developing countries. Therefore, better international treaties must be established, which are expected to include forming independent affiliates and enhanced financial assistance, technical assistance, and so on.*

Keywords: *Climate Change; Pandemic Disease; Developing Countries; International Organization; International Law; Carbon Market; Biodiversity; Vaccination; Intellectual Property*

1. Introduction

Under the United Nation's agenda of achieving sustainable development by 2030, states face global challenges to cooperate. Climate change and public health are two significant aspects of sustainable development in the 2020s, which can be significantly solved by reforming international organizations and innovating international laws.

Human influences dominate modern climate change. UN Environment Programme report warns that unless greenhouse gas (GHG) emissions fall by 7.6% annually in the 2020s, the world will miss the opportunity to achieve the 1.5°C temperature goal of the Paris Agreement (PA) (UNEP, 2019). The existing international framework for climate mitigation needs to be more effective and consider synergistic issues like biodiversity.

The carbon trading provision of the PA is an essential step of reform and helps developing countries finance climate mitigation. In a few studies of the carbon market, attention has been given to the direct correlation of mechanisms under PA and climate finance to developing countries. The synergies between climate change and biodiversity are also insufficiently addressed under the existing international framework. Cooperation between international organizations and a commitment to financial support and treaties are necessary to mitigate these issues better.

The global healthcare systems today face severe challenges in the face of the global public security crisis; the COVID-19 epidemic, a global pandemic in recent years, poses a significant challenge to the

world regarding epidemiological governance. A vaccine against the Coronavirus is a critical approach to mitigate the worldwide pandemic of the epidemic. The pressing issue for developing countries is the source of access to essential medicines but multinational medical companies who act as the main body of R&D medical resources, the high price of most drugs such as vaccines, and the need for massive domestic introductions that far exceed than they can afford.

The paper intends to discuss climate change and pandemic disease by evaluating current efforts and proposing potential changes. Under the threat of climate change, the Paris agreement is expected to create new mechanisms for the carbon market and help developing countries. This paper proposes new approaches to the lack of a synergistic solution for climate change and biodiversity.

In terms of public health international issues, organizations are expected to be more effective and better provide access to the vaccine for developing countries. Therefore, better international treaties must be established, including forming independent affiliates, enhanced financial assistance, and technical assistance.

2. How can international legal rules and institutions improve aspects of climate change?

2.1 The Paris Agreement's Impact on International Carbon Trading Market and developing countries.

2.1.1 Introduction

Climate change caused by dangerous greenhouse gas (GHG) emissions is considered one of the most severe sustainability challenges. Global actions in reducing emissions need international cooperation, and previous research shows that the carbon market is an effective market-based measure (Miola, Marra, &Ciuffo, 2011). The carbon trading provision of the PA is an essential step toward reform and helps developing countries finance climate mitigation.

Carbon markets are trading systems in which carbon credits are sold and bought. One tradable carbon credit is equivalent to one tonne of carbon dioxide or a different GHG reduced, sequestered, or avoided (UNDP, 2022). The quantity of carbon emitted is set, but entities with excess carbon credits can sell them to those with a shortage. The price of carbon varies in interconnected markets (Pollitt, 2019).

Although the PA settlement has not yet been realized, it is widely acknowledged that integrating international carbon markets will have several advantages (Pollitt, 2019). Linking carbon markets in wealthy and developing nations is an excellent method to get emerging countries to sign on to a global climate deal (Gao et al., 2019). Notably, a global market provides parties more flexibility to fulfill their Nationally Determined Contributions (NDCs) and increase the ambition for mitigation targets. The present study will discuss how PA reforms the mechanisms of the international carbon trading market and how it benefits developing countries.

2.1.2. International carbon markets under the Paris Agreement

Article 6 of the PA introduces Cooperative Approach and Sustainable Development Mechanism, two international carbon markets that receive extensive attention and are anticipated to play an essential role in the post2020 climate regime.

2.1.2.1 Cooperative approaches

PA Article 2 proposes parties' voluntary trade of International Transferred Mitigation Outcomes(ITMOs) toward their Nationally Determined Contributions(NDCs), increase the ambition of mitigation actions, and ensure environmental integrity.

The guidance of CA needs to ensure environmental integrity and promote sustainable development. Ecological integrity will be provided if the engagement in international transfers leads to aggregated GHG emissions no higher than before the transfers occur. When transferring ITMOs, Parties must use

robust accounting, according to Article 6.2. (Art. 6.2 PA, 2016), else Global GHG emissions may rise following international transfers of ITMOs.
Article 6.2 underscored the avoidance of double counting. When another country uses the mitigation outcomes for NDC attainment while the reductions are still reflected in the host country's inventory, double claiming would lead to a net increase in emissions and undermine environmental integrity(Kreibich& Hermwille, 2021). With the accompanying decision from Paris, Parties agreed that "corresponding adjustment," a concept extensively explored by academics in search of workable solutions, should be used to prevent double counting. By adopting the Katowice climate package at COP24, Parties have partially operationalized the prevention of double counting under Article 6.2 by requiring Parties to report an emissions balance adjusted based on corresponding adjustments.

2.1.2.2 Sustainable development mechanism

PA To increase the ambition of mitigation measures and guarantee environmental integrity, PA Article 2 suggests that parties voluntarily trade International Transferred Mitigation Outcomes (ITMOs) toward their Nationally Determined Contributions (NDCs).
Incentivizing mitigation activities by private entities and unlocking private-sector finance are critical outcomes of Article 6.4. Before the PA, public organizations like the World Bank drove demand in the voluntary carbon market (Bumpus & Liverman, 2008). However, most scholars agree that private enterprises with increased interest in becoming carbon or climate neutral will drive future demand. Private entities with extra emission credit voluntarily trade them with entities who want to compensate for their carbon footprints or make a profit by investing and reselling them at higher prices. Four hundred eighty-two businesses, with a combined estimated yearly turnover of US$16 trillion, set a neutrality aim in April 2021. The carbon market is a significant part of many businesses strategies to mitigate climate change. (Kreibich& Hermwille, 2021)
The participation of private enterprises in the international carbon market can increase climate finance and accelerate mitigation efforts. The revenue from emission trading by private entities will finance their climate mitigation effort. For instance, China requires climate financing of CNY2.52 trillion to meet its 2030 peak emission target. Currently, the yearly supply of climate money is only CNY525.6 billion. To make up for this shortage, private investments must be fully leveraged, and they can be attained through the international carbon market (Gao et al., 2019).
Unlike the Kyoto Protocol'sProtocol's carbon trading mechanisms, which is, in principle, a zero-sum game for the atmosphere lacking net reduction of global emissions, Article 6.4 markets are required to provide an OMGE, which suggests that sectors in the market should guarantee a net decrease in emissions rather than trying to offset CO2 emissions from one country with savings from another.
To achieve OMGE, automatic cancellation is considered the most feasible implementation. At the time of initial issuance or first transfer from the registry, a percentage of these emission reduction units (the OMGE portion) will be directed to a cancellation account. Only the rest of the teams are issued to the entities involved in the activity. In this way, a portion of the emission reductions credited under the Article 6.4 mechanism is not used by any country to achieve its NDC. The host Party will have to adjust correspondingly for the total emission reductions. The initial account and the OMGE cancellation account would be under the control of the supervisory body and outside the power of the host or acquiring Party. A mandatory cancellation for OMGE is affected through the first transfer of a minimum of 2% of the issued credit to the cancellation account (UNFCCC, 2022). An undecided "share of the proceeds" from trading under Article 6.4 will be saved and paid into the Adaptation Fund.

2.1.3. Impact on developing countries

Developed countries need to mobilize USD100 billion by 2020 for mitigation and adaptation in developing countries. Involving developing countries in carbon trading would provide substantial climate finance and stimulate developing countries' climate mitigation.

By selling their excess NDCs, developing countries better acquire capital inflows. Carbon pricing approaches offer opportunities to support countries in implementing climate policies based on market demand and thus promote low-carbon developments. Climate finance to low-income countries can also be supplied through carbon market transactions to the same countries. In carbon markets, climate finance can be provided in a less constrained approach and give donors higher flexibility to conduct their domestic climate policy separate from any climate support policy for low-income countries (Strand, 2019).

Under the PA, voluntary cooperation opportunity is more significant in developing countries. While African countries suffer the most from climate change's effects, despite being historically and currently low emitting, many demonstrate high climate ambitions in the spirit of shared responsibilities under PA. The Namibia government, targeting net-zero emissions, has committed to achieving a mitigation ambition of 91% compared to the Business-as-Usual Scenario, which it aims to achieve partly by entering into carbon markets. To do so, the government is now designing key building blocks for a carbon market framework. With funding from Japan, building solid data management systems will be a crucial part of the Namibia carbon market framework (Steven,2022).

2.2 Brief descriptions and views on synergistic solutions to biodiversity and climate change at the international organization level

2.2.1 Introduction

Biodiversity is a term that is defined as all types of organisms that live on Earth, including animals, plants, and microorganisms, and their interactions with entire ecosystems (Royal Society, 2021, p.2). Biodiversity is not only related to the well-being of everyone but also has an inseparable interaction with the ecosystem (Dunne, 2022). At the same time, climate change is an important issue in today's international society and has an essential interaction with biodiversity (Harper, 2018). However, it is currently estimated that the social treatment measures for these two aspects have not achieved excellent results (Johnson et al., 2017, p.2). This essay will discuss the interaction between biodiversity and climate change and the solutions of international organizations and treaties to such problems before giving relevant recommendations and conclusions.

2.2.2 Interactions between biodiversity and climate change

Climate change will damage biodiversity in all aspects, and the loss of biodiversity will further accelerate the deterioration of climate change and lead to more severe damage to biodiversity, thus forming a vicious circle (Royal Society, 2021, p.4). IPCC's recent assessment concluded that warming has already caused "substantial damages and increasing irreversible losses to land ecosystems across every region of the world." A significant impact of climate change on organisms is the encroachment on their habitats, causing them to migrate and adversely affecting biodiversity (Dunne, 2022). A case in point is the further loss of associated marine species due to the dramatic reduction in coral populations caused by climate warming (Royal Society, 2021, p. 3). Another example is bees and flowers, where a warming climate affects the habitat of bees, which affects the pollination of related plants, which in turn affects the reproduction of these plants and has adverse consequences for the environment (Columbia Climate School, 2018). Johnson et al. (2017, p.1) also mention this and further emphasize that macroinvertebrates will be the first to be most threatened by climate change, affecting ecosystems across land and sea and further climate degradation. IPCC also mentioned essential interactions between the two in its 2022 Summary for Policymakers.

2.2.3 Status of current international organizations and treaties addressing climate and biodiversity issues

International organizations have made a series of efforts to deal with these problems, including the formulation of the Convention on Biological Diversity; world leaders pledged through the CBD "to

achieve by 2010 a significant reduction of the current rate of biodiversity loss", the formulation of " Aichi Biodiversity Targets" (Johnson et al., 2017, p.2). Although relevant international organizations have good plans and visions, most of the goals have not been achieved, and even further damage to biodiversity and climate change (Johnson et al., 2017, p.2). An example of this is the Aichi Targets, which achieved only a tiny fraction of the targets and, instead of accelerating the rate of biodiversity loss, showed a trend of further deterioration (Johnson et al., 2017, p.2). The Royal Society (2021, pp.5-6) also mentions the implementation of these measures in specific countries. Among them, the United Kingdom, as a relatively important country, has formulated a series of plans and actions, including "Our green party" (sustainable development plan) and "blue belt" (marine life protection plan), but whether it is terrestrial or aquatic the effect is not very ideal, there is a big gap from the expected (Royal Society, 2021, pp. 5-6).

Dunne (2022) argues that an important reason why biodiversity loss and climate change are both challenging to address is that despite their many overlaps, international organizations and most countries still deal with them separately. One of the most prominent examples is between the two international organizations, UNFCCC and CBD (Dunne, 2022). Whether they are formulating plans, setting up institutions, or meeting times, they are carried out separately (Dunne, 2022). As an authoritative international organization in related fields, they will cause biodiversity and climate change issues in the international community to be dealt with separately (Dune, 2022). Similarly, Both Johnson et al. (2017, p.3) and the Royal Society (2021, p.9) argue that policy responses are primarily directed to only one of the two, which may be an important reason why neither can be fundamentally addressed or mitigated. Pettorelli et al. (2021, p.2385) further mention that climate change and biodiversity have gradually begun to receive attention in each other's plans, and further integration of them to play a synergistic role will be an essential direction to solve related problems better.

2.2.4 Future directions for increasing synergies between biodiversity and climate change

This essay believes that to better address biodiversity and climate issues, it is suggested that the following adjustments should be made in the relevant international treaties and international organizations:

Firstly, relevant international treaties should include references to corresponding synergistic measures and specific future directions. IPCC has already mentioned in its Sixth Assessment Report in 2022 that future efforts will combine biodiversity to address climate change, a significant development. However, many international treaties still only stay in their fields and do not reflect synergies well. The Convention on Biological Diversity might be one example. To address these issues, they need to mention common parts and collaborative directions in plans and treaties (Dunne, 2022). Furthermore, at the treaty level, they need to work out a more detailed guide for future cooperation, not just mention each other. For instance, Nbs (nature-based solutions) that integrate biodiversity and climate change are necessary for this process.

Secondly, global climate change and biodiversity organizations need deeper cooperation and synchronization. Dunne (2022) argues that UNFCCC and CBD need to cooperate and unify in all aspects, including meeting time, proposal time and direction, and in-depth cooperation to formulate future orders, to solve the two issues more synchronously. Moreover, Pettorelli et al. (2021, p.2385) claim that although some international organizations, such as the International Union for Conservation of Nature (IUCN), have taken some measures to consider both, the current adjustment is still not comprehensive and in-depth. Cooperating from an overall perspective is necessary to find solutions such as Nbs. In addition, measures of great significance to biodiversity and climate protection, such as rewilding and nature reserves, also require the joint promotion of various international organizations (Johns, 2019, p.29).

Thirdly, international organizations must allocate financial support more evenly and rationally

between biodiversity and climate change issues. Funding for biodiversity issues is currently extraordinarily scarce, and there is a massive gap between climate change issues (Barbier et al., 2018). The data shows that biodiversity issues probably need a bill of $100 billion annually, but the actual funding is only about $4 to 10 billion yearly (Barbier et al., 2018). At the same time, more than EUR 201 billion was spent on climate change in 2014-2020 (Grzelbieluch et al., 2018). Such unequal financial support will make it difficult for the two issues to develop synchronously, thus making it difficult for them to work together fundamentally and even ignore the loss of biodiversity (Pettorelli et al., 2021, p.2389). Therefore, if the two issues are to be well resolved with each other at the same time, the unequal financial support should first be improved before further in-depth collaboration can be achieved (Pettorelli et al., 2021, p.2389).

3. How can international legal rules and institutions improve aspects of the global public health response to pandemic disease?

3.1. How can international law and institutions ensure that major medical companies' resources are available to the developing world in a pandemic situation?

3.1.1 Introduction

The poorest countries in developing regions carry the highest burden of disease: communicable diseases (CDs), non-communicable diseases (NCDs), and the risk of new conditions related to changes in the social and physical environment, the socio-behavioral illness (Stevens & Huys, 2017).

Transnational pharmaceutical companies, which can improve this situation, are often unable to provide essential drugs at low prices to these countries in urgent need of medical assistance, as they believe such actions would infringe on their intellectual property rights and financial gains.

However, at a time when global epidemiological problems need to be solved, how to legally import drugs and even obtain technical support from multinational pharmaceutical companies in less developed regions is a complex issue that international organizations, led by the WHO and WIPO, need to coordinate, both to ensure concern for developing countries access to drugs and to take into account the protection of intellectual property rights of major medical companies.

3.1.2 Dilemmas get in the way

3.1.2.1 Global epidemics and unsound healthcare systems in developing countries

For developing regions, the lack of necessary healthcare resources has been the most significant gap between their social health system, which usually includes personnel, healthcare costs, healthcare institutions, healthcare beds, healthcare facilities and equipment, knowledge skills, and information. Despite the rapid development of the global healthcare sector in the last decade or so, considering the economic conditions and fiscal budgets of developing international countries, their healthcare expenditure far exceeds that of most less developed economies. The lack of adequate technology to cover the healthcare needs of the entire population and the inability to pay multinational pharmaceutical companies high costs to import essential drugs creates anxiety between the progressively expanding demand for healthcare resources and the unevenly distributed healthcare supply in some developing countries.

There is no doubt that in the absence of an effective drug or vaccine, just as the massive Ebola outbreak of 2014 exposed Africa's fragile healthcare systems, if Ebola was to emerge from critical cities in developed countries, the healthcare systems in those cities could effectively contain the virus and ultimately eliminate the disease. （Scott, Browne & Sanders, 2016） Why this discrepancy? A paper published in JAMA argues that “the answer lies not in the virus, but in the overall inability to secure sufficient health care personnel, resources, and provide quality health

care." (Boozary, Farmer & Jha,2014,18)

Since the end of 2019, the outbreak of the COVID-19 epidemic has triggered an "earthquake" in healthcare worldwide, once again highlighting this lack of primary healthcare resources, especially in developing countries and regions, exacerbating the imbalance between supply and demand. The shortage of essential medical supplies, such as vaccines and therapeutic drugs, and even the market circulation of generic medicines, has challenged the already unsound and uneven healthcare systems of most developing countries, infringed on the intellectual property rights of multinational pharmaceutical companies and posed a severe threat to global public security.

3.1.2.2 Access to Medicines in Developing Countries vs. Intellectual Property of Transnational Pharmaceutical Companies

The global healthcare systems today face serious challenges. In the face of the global public security crisis, the pressing issue for developing countries is the source of access to essential medicines, the high price of most drugs such as the COVID-19 vaccines, and the need for massive domestic introductions that far exceed the financial allocations of these governments for health care.

When developing countries' health security is threatened, additional pressures will be added to the debt vulnerability base of their national finances, exacerbating the global economy's instability. When developing countries are increasingly heavily indebted, developed countries will also face the challenge of a collapsing economic system. At the same time, the effective control of epidemiological problems on a global scale can be delayed if people in developing regions do not receive timely treatment, thus causing a massive shift in health problems across borders.

"The focus on patent regulation is largely misguided, and the targeting of pharmaceutical companies and TRIPS has led to an unfortunate divergence from the actual critical issues that affect the delivery of much-needed care and medicines to the developing world. The critical issues are not constructing appropriate TRIPS provisions but providing financial resources to build, maintain and stabilize proper healthcare systems in developing countries afflicted with public health crises."(Stevens & Huys, 2017)

With a brief historical overview of the development of the "health and human rights" concept, as a human right, health is a challenge for developing countries. The scholar devoted themself to analyzing constraints and identifying the solutions that will allow health to become an absolute 'human right' for the people of developing countries.

3.1.3 The role that major medical companies play

As for the major pharmaceutical companies, what matters most is the financial gain, but their top priorities also include meeting the obligations to the international community and accommodating the demands of developing countries.

For transnational pharmaceutical companies, as the economic stakeholders, who are non-state actors, therefore, are more challenging to instill human rights conventions or promote health justice initiatives. The pricing of medical supplies may fall when multiple companies participate in the global market. Still, international bodies such as the World Intellectual Property Organization (WIPO) may sometimes urge significant reductions in drug prices when the right to health security for human rights is at stake or acquiesce in requests for governments in developing countries for medical companies for parallel imports. On the one hand, multinational medical companies have the right to refuse requests for imports at low prices for protection against their ownership of the pricing mechanism. On the other hand, the lack of commitment to medical companies to pricing mechanisms may put them at a disadvantage at the humanitarian level.

3.1.4 A balance between IP and Human Rights in Developing Countries

3.1.4.1 What should the relationship be between the WHO and major medical companies, mainly to promote access to medical treatments for the developing world?

Seeking to promote social development and welfare through technological innovation, technology

transfer, and technology diffusion, and to achieve a balance between the interests of IP owners and users, remains a concept that needs to be followed in the international IP system in the 21st century.
In response, related national organizations must promote the formation of public-private partnerships between pharmaceutical companies and governments, thereby using them to transfer intellectual property rights to medical technologies and medicines to developing countries and other countries in need of medical assistance.
Under such conflicting conditions, what matters most is to overcome the barriers to intellectual property rights and maximize the interests of both parties, which will require a new balance to reconcile outcomes that maximize the interests of both parties.

3.1.4.2 How to create a new balance of the interests of both sides.

According to Sustainable Development Goal 3, which aspires to ensure health and well-being for all. It also aims to achieve universal health coverage (UCH) and to provide access to safe and effective medicines and vaccines for all. Advocating for access to vaccines and drugs and ensuring a human rights-based approach is essential to this process. (WHO)
And how non-governmental organizations and private foundations, such as World Health Organization (WHO), World Intellectual Property Organization (WIPO), World Trade Organization (WTO), and Bill & Melinda Gates Foundation (BMGF) can defend the national healthcare rights of developing countries without infringing on the intellectual property rights of multinational medical companies.
Thus, a certain degree of ceding IPRs at particular times is critical for copyright owners (in this paper, multinational pharmaceutical companies) to contribute to global public safety and epidemiological development while relying on the protection against international IP organizations such as WIPO, which still retains control over the use of IPRs and patent terms.
And for most developing country governments, when access to the use of IP-protected medical technologies is obtained by formal means and for public health reasons, such as parallel importation and compulsory licensing, it not only effectively expels cheap generic drugs circulating in the market but also enables the flow of funds to medical companies to promote corporate innovation and R&D, on this basis, when disputes still inevitably arise, the international community should first focus on human rights of developing countries.

3.2. New Content in Treaties for International Organizations: How Can International Organizations Become More effective in helping developing countries access vaccine

3.2.1 Introduction

The COVID-19 epidemic, a global pandemic in recent years, poses a significant challenge to the world regarding epidemiological governance. A vaccine against the Coronavirus is a critical approach to mitigate the worldwide pandemic of the epidemic. The paper intends to discuss that international organizations are expected to provide vaccine access for developing countries more effectively and better. Therefore, better international treaties must be established, which are expected to include forming independent affiliates and enhanced financial assistance, technical assistance, and so on.

3.2.2 Previous rules and new efforts related to COVID 19

3.2.2.1 Current rules or processes around vaccine access

According to World Health Organization Constitution(1946), one of the basic principles is that the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being, regardless of race, religion, political beliefs, economic or social conditions. Such a principle has been implemented worldwide and is also true in controlling epidemics and vaccine acquisition. This means that the international community needs to assist countries that cannot develop, produce or buy vaccines on their own to guarantee every human's fundamental right to survival and health. In 2011, WHO developed the Framework for Pandemic Influenza

Preparedness(PIP framework), which includes virus-sharing, benefit-sharing, and governance mechanisms, but it is for influenza viruses only. (Ye, 2021) Some control of epidemics is put into practice. The International Health Regulations(IHR) mentions outbreak reporting and management of viruses before the COVID-19 outbreak.

3.2.2.2 New developments during COVID 19

The COVID-19 epidemic is spreading globally, and the international community is actively collaborating to control and manage the pandemic with several new initiatives in place. The COVAX, which the Global Alliance leads for Vaccines and Immunisation(Gavi), the Vaccine Alliance, the WHO, and the Coalition for Epidemic Preparedness Innovations(CEPI), with their crucial delivery partner United Nations International Children's Emergency Fund(UNICEF), is working with manufacturers and partners to procure COVID-19 vaccine doses, as well as shipping, logistics, and storage. GAVI Council approves GAVI as a legal entity to manage the COVAX fund to work with vaccine producers to produce sufficient vaccines and use the collective purchasing power of participating countries to reach a reasonable price. (Zhang and Duan, 2022) COVAX has distributed more than 170 million vaccine doses among 138 countries, based on a framework developed by an expert group of ethicists, scientists, and other public health experts and reviewed by WHO Member States. (World Health Organization, 2021) It is now leading procurement and delivery efforts in 92 low and middle-income countries and supporting procurement in more than 97 upper-middle- and high-income countries. These countries account for more than four-fifths of the world's population. (United Nations International Children's Emergency Fund, n.d.)

Meanwhile, to accelerate COVID-19 testing, treatment and vaccine development, production, and equitable access, WHO, UNICEF, Gavi, and the Vaccine Alliance launched the COVID-19 Vaccine Delivery Partnership(CDP). By working closely with countries to focus on bottlenecks in vaccination issues, the CoVDP provides emergency operational funding, technical assistance, and political engagement to several countries to rapidly scale up vaccination and monitor progress toward vaccine rollout goals. (World Health Organization, 2022)

3.2.3 The remaining problems of vaccine access and how they can be solved.

Although international organizations and countries have made great efforts to guarantee the vaccination of the new crown, there are still problems that cannot be ignored. Due to high research and development technology, increased capital investment, and low profitability, the global vaccine research and development initiative is in the hands of a few developed countries, with 76% of global vaccine production coming from Europe and 13% of global vaccine production in North America, according to 2019 data. Less developed regions such as Latin America, Africa, and parts of Asia, on the other hand, cannot develop vaccines and have to rely on the transfer or trade of vaccine technology from developed countries. (Yan, 2022) Big Pharma companies from developed countries control vaccines' intellectual property and production technology. This situation causes the high cost of vaccines and continues to plague the international community nowadays. Once without a fundamental solution to the problem of vaccine production in developing countries, especially vaccines for COVID-19, the efforts of international organizations will drop into the bucket, as the WHO has limited funds paid by member states. Relying only on purchases and delivery to developing countries will guarantee vaccination for a portion of the population. In addition, vaccination and transportation require a high level of conservation techniques and surveillance systems, a functioning health system with adequate infrastructure, population expansion, human resources, and appropriate information systems. (Organization for Economic Co-operation and Development, 2021) All of this suggests that vaccination will be more expensive and that intellectual property barriers will be more challenging to break down.

3.2.4 Creation of new international institutional powers to research and develop vaccines

It is shown from the data and research in the previous sections of this paper that international

organizations such as the World Health Organization still need to be more effective in providing access to vaccines for some countries in distress from the epidemic. A feasible solution could be to establish independent branches of international organizations to govern matters related to vaccine acquisition, create separate vaccine development teams and researchers, and adopt treaties that require member countries to provide funds for research and development or to purchase intellectual property for vaccines. The new organization could acquire the intellectual property rights to the vaccine through its research and development, as well as build its plant to produce the vaccine and work with the world's major vaccine companies to cooperate; the main effect would be to reduce the cost of acquiring the intellectual property rights to the vaccine and reduce the difficulty of replicating the vaccine.

There are three ideas for establishing an independent body as follows. Firstly, instead of having to pay for a limited number of vaccines, international organizations can obtain the ability to produce vaccines on their own through independent research and development, thus reducing the cost of vaccines for developing countries, which do not have to enter into relatively expensive orders with vaccine companies or other countries but can obtain vaccines from WHO-affiliated institutions at a lower cost. Secondly, vaccine manufacturers receive subsidies from international organizations to reduce the technical difficulties and intellectual property barriers to vaccine replication, which helps fundamentally to help developing countries in difficulty to get rid of the situation that they can only rely on aid for vaccine acquisition. Third, international organizations can depend on professional institutions to carry out Public-private Partnerships and require relevant pharmaceutical companies to carry out parallel importation and compulsory licensing to member countries, which should grant some developing countries in difficult epidemic situations the right to access medical technologies protected by intellectual property rights for public health reasons. Finally, the funding of the new agency needs to come from the payments of member countries according to the WHO treaty. To not increase the burden on member countries, the funds initially used to purchase vaccines can be invested in establishing and operating this agency.

3.2.5. Inclusion of these powers either in the WTO Constitution or a new pandemic treaty

A new international treaty would need to obtain legal permission to establish an independent body and seek financial and technical support from member states, that is, to set up its technical staff and production site, identify sources of financial aid for this independent body, negotiate with vaccine manufacturers for priority rights to the intellectual property of the vaccine, and establish basic rules to ensure the quality of the vaccine.

4. Conclusion

In conclusion, recommendations are made regarding the reform of climate change and public health international laws and intuitions, though challenges do exist. Although under the Paris Agreement, the diversity of NDCs is a crucial challenge for ensuring robust accounting for international transfers in a carbon market, there are prospects for practical implementation. The Paris Agreement could create cooperative approaches and sustainable development mechanisms to achieve effective mitigation and climate finance in developing countries.

The current international organizations on climate change and biodiversity, mainly based on CBD and UNFCCC, have yet to solve related issues well. There needs to be better coordination between the two parties. Therefore, this paper proposes three adjustments to improve this problem, from the mention of international conventions, the in-depth collaboration of meetings and plans, and a more reasonable allocation of funds.

The vaccine acquisition challenges are analyzed again in this thesis based on previous studies. Due to several issues, such as the difficulty of vaccine development and the high price of access, establishing an independent WHO-affiliated agency would be helpful. The main functions of this

subsidiary include public-private partnerships to help developing countries overcome intellectual property rights issues for vaccines and having their scientific capacity to help develop and produce affordable vaccines.

Shortly, Sustainable Development Goals will be achieved in these fields: climate change mitigation, biodiversity, the intellectual property rights of multinational pharmaceutical companies, global public health, and access to vaccines in the developing world. The interests of these subjects will be safeguarded and balanced under international laws and intuitions. Where necessary, our priority remains the right to life and personal security concerns of the nationals of each country.

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