Presented at the DLSU Research Congress 2017
De La Salle University, Manila, Philippines
June 20 to 22, 2017

A Legal Assessment of the Protection of Indigenous Knowledge Against Biopiracy in the Philippines and ASEAN

Rosanna Faye O. Ongpin[1] and Ellyssa Marie E. Timones [2*]
[1] *De La Salle University, Manila*
[2] *De La Salle University, Manila*
**Corresponding Author: ellyssa_timones@dlsu.edu.ph*

Abstract: With 110 indigenous communities relying on their traditional knowledge on natural medicinal plants to treat their ailments, the Philippines, along with the whole South East Asian region has become a breeding ground for biopiracy especially in the pharmaceutical industry. This research paper seeks to identify the gaps in the law which allow for biopiracy, and to evaluate the protection provided for by the current legal system. The study utilized the qualitative approach of analyzing the applicable laws, rules, and regulations with the application of some economic concepts. Although current legislation provide for and recognize the rights of indigenous peoples over their traditional knowledge, there exists discrepancies with respect to the rules on FPIC, right to develop, benefit sharing, and ownership, which provide an avenue for acts of biopiracy to continue.

Key Words: traditional knowledge; free and prior informed consent; indigenous communities; benefit sharing; biopiracy

1. RESEARCH PROBLEM

1.1 Research Background

The Philippines is a culturally heavy and diverse country with over 110 ethno-linguistic groups, containing over 17 million indigenous people. 61% of these groups are located in Mindanao and around 33% in Northern Luzon (Navarro, 2010). Many indigenous communities in the Philippines have long been existing, even before the dawn of modern medicine. These groups also have little to no access to this medicine due to geographical location. How did these groups continue to exist despite this? These groups have been making use of orally passed tradition and knowledge about medicinal plants and processes. This has created opportunities for large companies such as research institutions or pharmaceutical businesses to research about a wider range of modern medicine. Despite the rights that are given to the indigenous peoples, delineated in the Indigenous Peoples' Rights Act of 1997, these companies have a tendency to abuse these communities. The information regarding medicinal solutions is sometime taken from these people without their consent, and sometimes, even without benefit-sharing.

Some of the more popular examples of the situation is the exploitation of the Philippine Sea Snail (scientific name *Conus Magus*). Scientists isolate a toxin from this snail (called SNX-111), which is reportedly a painkiller much stronger than morphine. This is used to treat chronic pain. The pharmaceutical company, Neurex, which is based in the United States, has patented SNX-111 around the world, even owning all 3 patents in the Philippines. It is said that Philippine scientists, using government budget, capitalized the snail which not only led to foreign ownership of the snail, but exploitation as well, by foreigners (Bengwayan, 2016).

Another example of this is the capitalization of the ampalaya, or the bitter gourd, together with eggplant, which becomes an effective cure against diabetes; the combination of which was granted a US patent under the US pharmaceutical company called Cromak Research, Inc, although these vegetables have long been used by indigenous peoples of the Philippines in the prevention of diabetes (Bengwayan, 2016). Aside from this, the Philippine Yew Tree (scientific name *Taxus Matrana)* was uprooted in Mount Pulag National Park in the Benguet Province of the Philippines; this is said to have great potential in treating cancer because of the chemical called *taxol.* The scientists who have taken this stopped responding to the Department of Environment and Natural Resources after the uprooting (Agillon, 2007).

Intellectual Property is defined by the World Intellectual Property Organization as creations of the mind which encompass copyright and related rights, trademarks and service mark, geographic indications, industrial designs, patents, layout-designs of integrated circuits and trade secrets. The Intellectual Property Code of the Philippines, which was made effective on the 1st of January in 1998, recognizes the role that intellectual property has for the benefit of society; it states that creating a system to properly protect intellectual property serves as an avenue for development of creative activity in the country, aids in technology transfer processes, increases foreign direct investments for the country and makes domestic products more accessible.

The Intellectual Property Code of the Philippines was merely patterned after the Agreement on Trade-Related Aspects of Intellectual Property Rights or the TRIPS Agreement. This agreement is an international agreement created during the Marrakesh Treaty Establishing the World Trade Organization and this sets down the minimum standards for the creation of laws relating to intellectual property in state signatories of the agreement. This agreement need not fully comply with the provisions included in the TRIPS Agreement, but contrary provisions to TRIPS must not be included.

According to both the TRIPS Agreement and the Intellectual Property Code of the Philippines, the protection and enforcement of intellectual property is most important in the diffusion and dissemination of knowledge and technological innovation. It also recognizes that the protection of intellectual property improves social and economic welfare, which in turn, promotes national development in each country.

In an article by Maricel Estavillo (2012), she states that a patent is an exclusive right that is granted to an inventor of a certain innovation or invention to fully exploit and charge rents for the use of the invention in exchange for the disclosure of the invention to the public. A patent has a term of protection of 20 years and this may be renewed within limits specified by the IP Code. At the end of the term of a patent, without renewal, the public is then free to use and exploit the patent and its benefits. The Patent System, as encoded in the Law of Patents in the IP Code, serves as an avenue for the government to enhance and improve information dissemination and public knowledge, especially in fields of technology. The Patent System is also created to strike a balance between the benefits that are received by the inventor and the benefits that are received by the public from the invention of a useful innovation. While the inventor is protected from unauthorized use of his invention, his disclosure of the invention to the public contributes to research and development. The system is also set up in a way that encourages more innovation from innovators.

Patentable inventions, according to Section 21 of the Law on Patents, are any technical solutions to a problem in a field of human activity. An invention may only be patentable for as long as they are novel, involves an inventive step and can be industrially applicable. The Intellectual Property Code also enumerates the inventions that are non-patentable such as scientific theories and mathematical methods, methods of doing business, etc. Enshrined in this provision is the statement that does not preclude the Congress from enacting

a law providing sui generis protection to community intellectual rights.

Mino Wekesa (2006) states that the current enumeration of intellectual property rights such as the above mentioned patents or trademarks fails to accommodate the protection of traditional knowledge which are the use of plants in medicine and agriculture. This creates the concept of *sui generis* so as to protect the knowledge imparted by the indigenous communities in the country. The current system of intellectual property rights protection does little to no positive effect towards the protection of indigenous knowledge and this creates the problem of biopiracy.

Biopiracy is the illegal acquisition of indigenous knowledge, genes, animals, plants and other biological materials with the goal of capitalizing them. It describes a practice in which indigenous knowledge of nature, originating with indigenous communities, is used by others for profit, without permission from and with little or no compensation or recognition to the indigenous peoples (Wekesa, 2006). This has been a growing problem not only in the Philippines, but also around the world in countries rich in natural resources and heavy with cultural heritage such as Peru, Brazil and Panama (Kariyawasam & Guy, 2007).

Indigenous people are aware of the medicinal plants and herbs in their own areas. This knowledge is then imparted generation to generation through oral practice and the attainment of this knowledge is only given when they have reach a level of hierarchy, This indigenous medicinal information and knowledge is sought after by pharmaceutical companies so as to save on money that will be used for medical research. These facts have led to the exploitation, and in some cases, overexploitation of the lands and resources of indigenous people.

The problem arises with the systems put in place that are supposed to protect the indigenous peoples and their intellectual property. Are they enough to protect the rights of the indigenous people?

There already exists a number of laws protecting the rights of indigenous communities with regard to their intellectual property, both internationally and domestically. In the international setting, there is the TRIPS Agreement, as highlighted earlier, that talks about the protection of traditional knowledge and folklore in a general perspective. There is also the Convention on Biological Diversity and the UN Declaration on the Rights of Indigenous Peoples (UNDRIP) which talk about the sustainable use of intellectual property and the right to self-determination as well as cultural heritage protection, respectively. Lastly, the WIPO Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore, or the WIPO-IGC for short which talks about the protection of intellectual aspects with regard to traditional knowledge.

In the domestic setting, there is R.A. 8371 or the Indigenous Peoples' Rights Act (IPRA) which embodies the rights of the indigenous peoples with regard to self-determination, cultural integrity, free and prior informed consent and ancestral domains. There is also in place R.A. 9147 or the Wildlife Act which talks about the traditional use of traditional knowledge as well as the right to free and prior informed consent in bioprospecting activities. There are also the following: R.A. 8423 or the Traditional and Alternative Medicine Act (TAMA) which talks about the right to a share of indigenous peoples from the commercialization of their traditional medicine knowledge, R.A. 9283 or the Intellectual Property Code of the Philippines, which was already discussed earlier, R.A. 9710 or the Magna Carta of Women which talks about the protection of the rights of indigenous women with regard to their indigenous knowledge and practices. Lastly, R.A. 10055 or the Technology Transfer Act which requires research and development institutions to disclose any biodiversity and genetic resource for all intellectual property protection.

In the ASEAN sphere, the main proponent that deals with the protection of intellectual property is the ASEAN Economic Community, whose goals are embodied in the AEC Blueprint 2025, which aims to create an economy that is, integrated with other economies around the world. This involves connectivity and dynamism, as well as competitiveness and cooperation across and through the ASEAN countries. The AEC is also in charge of creating an identity for the nations in the group. Because this sector is vital in the free movement across the world, they are also vested with the obligation to protect the intellectual property of those within the community. To this end, the ASEAN Intellectual Property Rights

Action Plan 2011-2015 was created. Because of the creation of the AEC and its goal of economic integration, there is a need to couple their goals with the protection of communities within their scope, especially when it comes to the use of their assets such as intellectual property.

It is ideal that all these laws and *sui generis* protection laws exist in harmony with one another, without the clashing of certain provisions that protect the rights of indigenous people with regard to their intellectual property. When these laws are all concurrent and are not contrasting with one another, it can slowly alleviate the problem of biopiracy because of the proper system that is in place to protect the rights of the indigenous peoples.

Seemingly, there are discrepancies in the law that creates an avenue by which medical experts and pharmaceutical companies commit biopiracy. The research discussion for this paper will involve a reevaluation of the Philippine legal system, as well as the protection these communities can afford of in the ASEAN level, that should be a way to protect the intellectual property and traditional knowledge of indigenous people.

1.2 Research Question

To this end, the researchers would like to research if the Philippine legal system, specifically the Traditional and Alternative Medicine Act, as well as the ASEAN Intellectual Property Rights Action Plan 2011-2015, are able to protect the indigenous communities from biopiracy? In order to find a solution to this main research question, we also investigate the following:

a. Whether or not NCIP AO 3 prescribing the guidelines on drafting penalties for violation of free and prior informed consent, as followed by the implementing rules of TAMA in Rule IX, Section 2, is indeed producing the ideal equitable terms for both indigenous people and resource users?

b. Whether or not Article III, Section 6 of the TAMA regarding the powers given to the research institution to develop the traditional knowledge fully coexists with the rights of the indigenous people to develop the manifestations of their culture as delineated in Article 11 of the DRIPS?

c. Whether or not the ASEAN Intellectual Property Rights Action Plan 2011-2015 is an efficient avenue for indigenous peoples to protect their traditional knowledge and intellectual property?

1.3 Operational Definition of Terms

Biopiracy – refers to the illegal acquisition of indigenous knowledge and biological materials with the goal of capitalizing them (Wekesa, 2006); when indigenous materials are used for profit with little or no compensation or recognition to indigenous peoples (Wekesa, 2006)

Bioprospecting – refers to the exploitation of traditional knowledge for medicinal, commercial, and other purposes (Garcia, 2007)

Community Intellectual Rights — Refer to the rights of ICCs/IPs to own, control, develop and protect the past, present and future manifestations of their cultures, and science and technology including, but not limited to, medicine, health practices, vital medicinal plants, indigenous knowledge systems and practices. (R.A. No. 8371)

Customary laws – refer to a body of written and/or unwritten rules, usages, customs and practices traditionally and continually recognized, accepted and observed by respective ICCs/IPs. (NCIP AO 1-2012)

Free and Prior Informed Consent (or Prior Informed Consent) – refers to the consensus of all members of the ICCs/IPs to be determined in accordance with their respective customary laws and practices, free from any external manipulation, interference and coercion, and obtained after fully disclosing the intent and scope of the activity, in a language and process understandable to the community; (R.A. No. 8371)

Indigenous Cultural Communities/Indigenous Peoples - refer to a group of people or homogenous societies identified by self-ascription and ascription by others, who have continuously lived as organized community on communally bounded and defined territory, and who have, under claims of ownership since time immemorial, occupied, possessed and utilized such territories, sharing common bonds of language, customs, traditions

and other distinctive cultural traits, or who have, through resistance to political, social and cultural inroads of colonization, non-indigenous religions and cultures, became historically differentiated from the majority of Filipinos. (R.A. No. 8371)

Indigenous Knowledge Systems and Practices - Refer to systems, institutions, mechanisms, and technologies comprising a unique body of knowledge evolved through time that embody patterns of relationships between and among peoples and between peoples, their lands and resource environment, including such spheres of relationships which may include social, political, cultural, economic, religious spheres, and which are the direct outcome of the indigenous peoples, responses to certain needs consisting of adaptive mechanisms which have allowed indigenous people to survive and thrive within their given socio-cultural and biophysical conditions. (R.A. No. 8371)

Intellectual property – refers to creations of the mind such as inventions, literary or artistic works

Intellectual property rights – refers to the legal basis by which the indigenous communities exercise their rights to have access to, protect, control over their cultural knowledge and product, including, but not limited to, traditional medicines, and includes the right to receive compensation for it. (R.A. No. 8423)

Patent – refers to an exclusive right granted to inventions that are technical solutions to a problem in a field of human activity (R.A. No. 8293)

Prior Art – refers to everything which has been made available to the public anywhere in the world, before the filing date or the priority date of the application claiming the invention thus invalidating the application. (R.A. No. 8293)

Public domain – refers to everything that is known in the world that is not protected as intellectual property (Posey, 1947)

Sui generis – of its own kind; constituting a class alone; unique; peculiar (Posey, 1947)

Traditional knowledge (or indigenous knowledge) – refers to a living body of knowledge that is developed, sustained and passed on from generation to generation within a community, often forming part of its cultural or spiritual identity. (WIPO, 2015)

1.4 Scope of the Study

The study is limited to answering the issue of whether or not the Philippine legal system affords protection to the rights of indigenous peoples in relation to indigenous knowledge that have medicinal applications. For this reason, the researchers exclude other subjects of biopiracy such as biological resources and genetic resources. The study will involve reevaluating the Philippine laws and provisions mandating on the protection of the rights of indigenous communities, which has the force of laws already vested in them. International laws and treaties that the country is a part of will also form part of this study. All other provisions or laws that do not directly relate to the main issue will not be discussed exhaustively. The study is also limited to cases and legislations enacted after the effectivity of the 1987 Constitution.

2. METHODOLOGY

Through a qualitative analysis, the researchers determined whether or not local and international frameworks protect indigenous knowledge from biopiracy. In the local framework, Philippine laws particularly the IPRA and TAMA, and their implementing rules and regulations were examined; the ASEAN Intellectual Property Rights Plan 2011-2015 for the international framework. Whether or not traditional knowledge should be protected under this plan as patentable or non-patentable subject matter is recommended by discussing the advantages and disadvantages of both. Corollary issues were identified to be the means by which the researchers will investigate the main issue. The researchers investigated whether or not the guidelines on drafting penalties for violation of Free and Prior Informed Consent (FPIC) is producing the ideal equitable terms, and whether or not the powers given to PITAHC fully coexists with the rights of indigenous peoples.

3. RESULTS AND DISCUSSION

3.1 Free and Prior Informed Consent

The Free and Prior Informed Consent is a concept that is taken and derived from the right of indigenous peoples to their own self-determination and decision making. This was first discussed in the International Labour Organization (ILO) Convention 169 regarding the Indigenous and Tribal Peoples in Independent Countries and the United Nations Declaration on the Rights of Indigenous Peoples (DRIPS, 2007). In a paper done by the Department of Environment and Natural Resources (2013), the acquisition of Free and Prior Informed Consent was first described in the Philippines in the Indigenous Peoples Rights Act of 1997; this law describes this as a mechanism by which indigenous people are guarded from harm, as well as given equitable benefits from the exploitation of their resources. In Rule VI: Cultural Integrity, Section 17 of the IPRA IRR Series of 1998, anyone who may want to make use of the biological and genetic resources for any purpose is required to obtain FPIC from the community. The same provision states that the indigenous people have the initial rights to the exclusive use and development of their knowledge prior to dealings with any third party. It further defines the implementation of FPIC as the substantial compliance with the guidelines delineated in the IPRA, as well as with the requirements set out in the Administrative Orders of the NCIP. According to Wekesa (2006), the provisions and guidelines regarding FPIC act as "safeguards" of the intellectual property rights of the indigenous peoples of the Philippines. The acquisition of FPIC is composed of mining operations/exploration (53%), mini-hydro and dam projects (12%), forestry/agro-industrial projects (20%), transmission line programs (8%), exercise of priority rights in natural resources (4%) and research/plant/water system related projects (2%).

The full legal framework for the acquisition of FPIC stems all the way from international law, to municipal or domestic law. As mentioned earlier, the initiating legislation that discusses this obligation is the 2007 UNDRIPS which discusses that FPIC is a mechanism by which the indigenous peoples are given rights to their property, cultural rights and self-determination. This law imposes upon member-states the obligation to "consult and cooperate in good faith with the indigenous peoples concerned to obtain their free, prior and informed consent", The implementation of this obligation was backed up by jurisprudence given by the Human Rights Committee, the Committee on the elimination of Racial Discrimination, and the Committee on Economic Social and Cultural Rights of the UN. ("Free Prior and", 2013). In the domestic sphere, the 1987 Philippine Constitution and the IPRA are most widely known to be the providers of protective measures for indigenous peoples.

They describe the term 'free' as "taken without coercion, fraud, manipulation and bribery" and this also includes intimidation. The term 'prior' means that the consent is obtained substantially before any commencement of any bioprospecting activities with respect to the time that is needed for the ICCs to process their consensuses, while the term 'informed' means that the ICC knows of the nature, size, pace and scope of the bioprospecting activity. It is also important to note that both consultation and participation are important parts of the process of obtaining FPIC (Collins, 2016). According to NCIP AO 3, the guidelines for obtaining FPIC were enforced to protect indigenous peoples and ensure that they have the right to properly and fully develop their knowledge, as well as ensures that they receive a share of any benefit derived from their traditional knowledge. It also ensures the equitable partnership between the resource users and the indigenous community.

Collins (2016) discusses the need for 4 specific core requisites to have a sound FPIC implementation system, which are as follows:

1. Structural compatibility – which means that the FPIC structure should be consistent and in sync with indigenous practices and culture,
2. Clear process & representation – which means that geographical boundaries should be taken into consideration and clear negotiations need to be made between and among representative leaders,
3. Adequate allocation of resources – which should take into account the training, supervision and monitoring of the system itself, and
4. Equitable distribution of risk and liability – which means that risks should be spread out across all stakeholders, not just throwing all the weight on the vulnerable communities.

Statistics from of Department of Environment and Natural Resources (2013) show that only about 50% of the cases which involved bioprospecting were actually faithful in obtaining Free and Prior Informed Consent, following the guidelines prescribed in the above mentioned laws. Aside from this, there is a total of 44.1% cases that were reported to have no violations with regard to the said guidelines, with about 38.2% of cases with reported violations. As a whole, about 80% of the violators were responsible for the non-implementation the benefits as agreed upon in the Memorandum of Agreement. This study does not take into consideration those resource users that chose to forego the whole process of obtaining FPIC.

According to the TAMA in Rule IX, Section 2, the IPRA is a law that must be complied with before any bioprospecting activity is made and because the IPRA says that Free and Prior Informed Consent is a requisite to the extraction and use of traditional knowledge, then the non-compliance of the acquisition of free and prior informed consent is considered as an act of Biopiracy. The NCIP AO 3 states that the penalties for the non-compliance of terms and conditions which includes the applicability of customary laws are stated in the Memorandums of Agreement which are drafted between the resource user and the indigenous community. The same law says that to be able to draft a Memorandum of Agreement, it is important to first obtain FPIC from the community. This shows a disconnect where the punishment that is to be imposed on the non-compliance of the acquisition of FPIC cannot be enforced.

Although there exists a disconnect between the NCIP AO 3 and the IPRA with regard to the implementation of penalties, the law provided by the IPRA created a 'safety net', which seeks to enforce a penalty for the act of biopiracy in case the earlier provision is not complied with. This provision from the IPRA states that the indigenous peoples may still use other existing laws (such as the Revised Penal Code) to be able to penalize the act of biopiracy. From this, it can be said that there exists a cloud in the current legislation when it comes to imposing penalties, because of the clash in the provisions in both the NCIP AO 3 and the IPRA. Despite this, the researchers can say that the guidelines prescribing the acquisition of FPIC are indeed producing the ideal equitable terms for both the indigenous community and the resource users.

In explaining the dual opinion in this issue, the researchers will analyze the guidelines that are set in the NCIP AO 3 to obtain FPIC. The guidelines have been constantly changing and evolving, from the original set in 2002, to the change in 2006 and the most recent development in 2012 (which is embodied in NCIP AO 3). The following paragraphs explain the step-by-step process in obtaining the FPIC for the resource users.

The FPIC (Free and Prior Informed Consent) Process starts with the application of resource users for issuance of certification precondition. This application should be endorsed by the regulatory agency or government unit which holds jurisdiction over the area of the project. After the application, a pre-Field Based Investigation (FBI) Conference must take place in order to come up with a Work and Financial Plan (WFP) for FBI/FPIC. The WFP includes, among others, the estimated cost of expenses during the Field Based Investigation and documentation of the FBI activities.

The Conduct of the Field Based Investigation will commence within ten (10) days from the payment of the FBI fee, and must be accomplished within ten (10) working days from actual commencement. An FBI Report determining whether an ancestral domain shall be affected by the proposed project shall be submitted. Then, the Pre-FPIC Conference will be held. In this conference, the following shall be "taken up, acted upon or accomplished during the Pre-FPIC Conference: a) The FBI Report; b) Finalization and approval of WFP; c) Deposit/Remittance of FPIC Fee; d) Setting of schedules and tasking; e) Preparation of Work Order; f) Orientation on the FPIC process, protocols, and prohibited acts; g) Arrangements for the payment of the bond; h) Submission by the applicant of an undertaking, written in a language spoken and understood by the community concerned, that it shall commit itself to full disclosure of records and information relevant to the plan, program, project or activity, that would allow the community full access to records, documents, material information and facilities pertinent to the same; i) Submission by the applicant of an Environmental and Socio-cultural Impact Statement, detailing all the possible impact of the plan, program, project or

activity upon the ecological, economic, social and cultural aspect of the community as a whole.

After the payment of FPIC fee and after the requisites have been complied with by the FPIC team, the First Community Assembly shall be held. In the first assembly, there will be an orientation on IPRA and FPIC, validation of FBI Report, census of IPs, identification of IP elders and leaders, determination of consensus-building process, consensus on the involvement of NGOs/CSOs, validation of community representatives from the FPIC Team, presentation of agreed WFP, option, selection and invitation of experts, and arrangement of conflict resolution mechanisms by the chosen IP elders and leaders. The date and place of Second community assembly shall be decided upon in the First assembly.

In the Second community assembly, the applicant shall present the proposed project including its operation plan, cost and benefits to the ICCs/IPs, perceived adverse effects to the community and their corresponding preventive measures. If there are experts engaged, they shall share their opinions and recommendations. Other stakeholders such as NGOs and LGUs shall also share their remarks. The Second assembly shall also hold an open forum for the ICCs/IPs to ask questions and say their concerns. At the end of the Second assembly, the ICCs/IPs shall be left alone to agree on their consensus-building schedule and the deadline of their decision. This independent meeting of the ICCs must not be undertaken less than ten (10) days from the Second community assembly, and their decision must be completed within a reasonable amount of time but not more than 2 months from their independent meeting.

Following the Second Community assembly shall be the consensus-building period. This is the period when the ICCs/ IPs shall proceed to consult among themselves, employing their own traditional consensus-building processes, to further understand and discern the merits/advantages and demerits/disadvantages of the proposal in order to intelligently arrive at a consensus.

Non-members of the community must not participate or interfere with the decision-making process. At the end of the Consensus Building Period, the decision or consensus of the ICC shall be communicated by the Elders/Leaders to the FPIC Team. If the consensus is not favorable, a Resolution of Non-consent shall be undertaken.

Authors such as Collins (2016) reason out that some resource users or large corporations either choose to forego the process of obtaining the FPIC altogether, or they obtain the same, but subject to manipulation by the said resource user. The DENR (2013) states that the current legislation that delineates the guidelines for obtaining FPIC has actually worked in encouraging private entities and even the government itself to find ways to bypass the acquisition of FPIC, or "engineer consent". This is said to be the case because the process is very long and tedious, and could take over a year just to obtain the FPIC. According to Oxfam America in 2013, there are both weaknesses in the inadequate protection system and implementation of the FPIC. This includes systemic weaknesses as well as implementation issues.

The first being that there is no procedure or process that may be followed to challenge consent one it has been given to the resource user, or even to suspend or to stop altogether a project which has not complied with the guidelines for FPIC. This problem or weakness arises from the lack of provisions in the Administrative Order that provides for the guidelines for the acquisition of the FPIC. Another problem that comes from the lack of provisions is that there are no monitoring mechanisms for violations that are committed during the FPIC obtaining and MOA drafting process. Another important flaw in the guidelines prescribed by the NCIP AO 3 is that it does not provide for mechanisms that prevent the occurrence of bribery and unlawful violence/coercion between the resource user and the indigenous people, as well as the lack of grievance mechanisms that are available for the indigenous peoples. Below is a table that presents actual cases of violations in the FPIC acquisition process:

Table 1. Violations in the process of obtaining FPIC, including place and project proponents, and specific provisions in NCIP AO 3

VIOLATION	NCIP AO 3 PROVISION
Conducting activities without benefit of FPIC	Part I, Section 3(c)

Proceeding with construction despite NCIP's notice to the contrary for lack of FPIC Project proponent: Chevron Place: Tinglayan, Kalinga Project proponent: Globe Telecom, Inc. Place: Kitaotao, Bukidnon and Davao City	"No concession, license, permit or lease, production-sharing agreement, or other undertakings affecting ancestral domains shall be granted or renewed without going through the process laid down by law and this Guidelines."
Traditional process of decision-making of assembling all community members was not followed Project proponent: Shenzhuo Mining Group Corporation Place: Claver, Surigao del Norte Project proponent: Chevron Place: Tinglayan Kalinga	Part I, Section 4 "In the conduct of FBI, FPIC, and other processes provided under this Guidelines, including but not limited to dispute resolutions in relation thereto, the primacy of customary law and decision-making processes as determined by the ICCs/IPs shall be observed and adhered to."
MOA was written in English only Project proponent: Bulawan Mineral Resources Corp. Place: Labo and Jose Panganiban, Camarines Norte Project proponent: Natural Resources Management Development Corporation Place: Monkayo, Compostela Valley	Part V, Section 31 "The MOA shall be prepared by the FPIC Team strictly in accordance with what has been agreed upon by the parties, written in the language or dialect of the ICCs/IPs concerned, and thereafter translated into English and/or Pilipino."
MOA does not include penalties for violation of terms Project proponent: Agusan Petroleum and Mineral Corporation Place: Abra de Ilog, Mindoro Occidental	Part V, Section 32(r) "The MOA shall stipulate among others xxx the remedies and/or penalties for non-compliance or violation of the terms and conditions which includes applicability of customary laws and imposition of sanction/s."
MOA exculpates the proponent from future damages **MOA prevents indigenous people from filing cases in court** Project proponent: UNESCO – MBI Place: Calauit, Palawan	Part V, Section 32(n) "The MOA shall stipulate among others xxx detailed measures to protect IP rights and value systems."

As shown in Table 2, these flaws and weaknesses have physically manifested themselves in actual cases that have occurred over the past years in provinces in the Philippines. Note, because those are violations of certain provisions of the NCIP AO 3, the problem arises from either the lack of provision or the failure in implementation.

Looking at the guidelines more closely, there seems to exist 3 major problematic areas. The first being the most stated reason as to why resource users choose to forego the whole process of acquiring the FPIC or manipulate the process, and this is that the process appears to take much longer than is widely appropriate, especially because this process does not even involve yet the actual development of the drug. It seems to be a very extensive and long process just to obtain the consent of the community. Although the legislation does not intend to make it harder for the resource users to obtain the consent, it has proven to be a negative externality for them. In trying to further protect the indigenous communities from the act of biopiracy, the legislation has created a reason for biopiracy to be more prevalent than before lengthening the process.

The second major problem with the guidelines is the time that is allotted for the conduct of the Field Based Investigation might be too short to be able to complete all the necessary activities. This provision is stated in Section 13 of the NCIP AO 3, "The Team shall commence the FBI within ten (10) days from date of deposit/payment of the FBI fee and must be completed within ten (10) working days from actual commencement except when delayed by reason of fortuitous event or force majeure." The activities that are set to be done during this period are delineated in Section 9 of the said IRR. There are seven main tasks to be done for the duration of 10 days for the FBI team, and this could be a cause for the hinder of the process, or even the overall foregoing of the process.

The last major problematic area comes from the time-bound provision for consensus taking. This is the decision-making process undertaken by the indigenous community, and the definition of such is defined in Part I, Section 4, *"Consensus-Building and Decision-Making Process. The ICC/IPs shall participate in the decision-making processes primarily through their indigenous socio-political structures. They shall likewise affirm the decisions of their duly authorized representatives",* as well as in Part I, Section 5 *"Consensus-Building. It refers to that part of the decision-making process undertaken by the ICCs/IPs through their indigenous socio-political structures and practices in arriving at a collective/communal decision."* This clearly states that the consensus-building process will be based on their own customs and traditions.

Part III, Section 22 considers the time-bound provision of the consensus-building process. Collins (2016) states that some ICCs/IPs and civil societies raised the concern about removing this provision during the development of the guidelines, but were ultimately ignored. This is because resource users and indigenous communities have different priorities when it comes to the acquisition of the FPIC. While customary consensus-building tends to take long periods of time, resource users have stricter schedules to follow. It is said that the timeframes delineated in the guidelines are inconsistent and insensitive towards customs and practices of the indigenous peoples. There seems to be a problem with striking the balance between considering the line of equity between the two different groups. Positions of all stakeholders should be considered, to be able to come up with the ideal, equitable terms between both.

The takeaways from this scenario come in two forms: the first being that the intention of the state in lengthening or complicating the steps to obtaining the FPIC is to more comprehensively protect the rights of the indigenous people with regard to their traditional knowledge; the state intended to give more premium and weight on the rights of the ICCs given that the consensus of the whole community is required in obtaining the FPIC. The new design of the acquisition of FPIC process truly does prioritize efficiency, but it could be used as a tool of private entities to disempower local communities. It definitely acknowledges the fact that it is necessary that the State, together with private entities or corporations, are vital in the development of new medicine and cheaper alternatives to health care. Especially now in a growing and developing country, it is important to make more and more advancements when it comes to genetic resources and medicine. The State, under the TAMA, affirms their stand in understanding the importance of these partnerships.

The problems arise both for the resource user and the indigenous people therefore, there

really is a need to check whether or not the current legislation truly is creating the ideal, equitable terms between the two. Because of the flaws in the guidelines for acquisition of FPIC as well as the cloud in the penalties imposed for the non-compliance with the process, it can be said that whole process for the FPIC has created problems for both the resource users and most especially the indigenous people. These flaws are manifested in the violations as mentioned in Table 2. Although both parties are on losing ends from the process of FPIC, it is more damaging to the indigenous groups, especially because they are more vulnerable.

To further explain the stand in this paper, the researchers analyze the circumstances using economic analysis. The main supplementary material for this portion will be the Theory of the Firm. It is first important to understand the concept of transaction costs. According to Braendle (2010), these are costs that are incurred by a firm in its day-to-day transactions in the market, or to other firms. This is used to facilitate the selling and purchasing of some good or service in a certain industry. Normally, transaction costs are shared between the consumer and the producer, although some rare cases show the extremes where the burden of paying this full amount is shouldered by the producer, or even transferred fully to the consumer. Transaction costs may also refer to the costs between input suppliers and output producers. In this case, the indigenous peoples as the input suppliers and the resources users as the output producers.

Robert Coase (1937), in his analysis of the modern day firm, notes that a firm acts and makes decisions mainly to maximize its profits. In this case, it will produce output where marginal revenue will be equal to the marginal cost. This means that any revenue that a firm will make for one additional unit of output produced should be equal to the cost that it will incur for that output. For some firms to reach this profit maximizing condition, it will set a higher price and produce a lower quantity of goods. In maximizing profit, the firm may so decide to altogether forego the transaction costs that come with by shifting the full amount of the consumer. In the case of this study, it may also refer to the shifting of all burden and costs to the input suppliers or the indigenous peoples. In pursuing the goal of profit maximizing for the firm or the resource user, they may choose to forego of all costs that come with the acquisition of traditional knowledge. This may include, but is not limited to, the acquisition of the FPIC.

The same author also created what is today known as The Coasean Theorem, which highlights the importance of peaceful negotiations between firms to achieve the optimal market state. This means that to be able to properly and fairly tilt the balance between the resource user and the ICCs, it is important to make known the plans for development of the traditional knowledge by the resource user and disclose this to the indigenous tribe, so in turn, they may opt to give their consent to begin the development and research of this traditional knowledge. In furtherance of this concept, it is important to note that the Memorandum of Agreement is a very important tool in striking the balance between the two parties. Both said parties are subjects of this MOA, and will not be signed if either party has any opposition to the provisions stated therein. Peaceful negotiations must be made to come up with a sound and fair Memorandum of Agreement. The Theory of Coordination Failure is the aftermath of the non-compliance with the Coase Theory, which talks of the market collapsing when negotiations are not properly conducted in the market.

Although legislators intended for the whole process of obtaining the Free and Prior Informed Consent, as well the prescription of the penalties for violations in this process, the process does not actually produce the ideal equitable terms for both the indigenous people and the resource users. It may create problems and clouds for both the parties involved, but being a more vulnerable group, the indigenous people are on the losing end in this situation. Aside from the ambiguity in the penalties that are imposed for violations made in the FPIC process, the guidelines themselves have become an avenue for resource users to exploit the indigenous peoples' traditional knowledge. Therefore, the TAMA does not produce ideal, equitable terms for both the resource users and the indigenous people.

3.2 Development of Traditional Knowledge

According to Hobson (1992), it is the development of knowledge that paves way for the creation of solutions to problems. He also holds

that traditional knowledge is science, and that it should be utilized to improve research. In the field of medicine and health practices, traditional knowledge has both theoretical and methodological potential contributions. Reyes-Garcia (2010) identified the following: research on traditional knowledge help understand plant's efficacy by realizing its cultural context, and it helps acquire tools for understanding plant efficacy and health problems. Because of its potential contributions, traditional knowledge systems represent an enormous wealth both in the macro and micro perspective. Traditional knowledge is a factor in economic development and social and cultural well-being. This is affirmed by WIPO (n.d.) when it said that progress and well-being of humanity is dependent on the capacity to create and invent new works. Concurrently, traditional knowledge also represents other approaches to the acquisition and construction of knowledge novel to science (ICSU, 2002). This is evident in the exploitation, mostly illegal, done by enterprises in order to gain profit. Developing traditional knowledge for profit is what drives the commission of biopiracy.

Most indigenous people are not against development of their resources, rather they wish to be involved in the process. As resource holders, they would like to be respected as such and be involved in the decision making pertaining to the development. This is to "protect the elements that define their identity and that are crucial for the resilience of their communities and preservation of their culture" according to Croal (2012). Hobson (1992) adds that inclusion of the indigenous peoples may be through voluntary action, the permit process, or legislation.

Philippine legislation has given the indigenous peoples the right to develop their indigenous knowledge, as set forth in the IPRA and its implementing rules and regulations. Moreover, the indigenous peoples are given priority in the development, utilization and other similar and related processes of their resources.

In order to accelerate the development of traditional and alternative health care, the Philippine Institute of Traditional and Alternative Health Care (PITAHC) is created by law. The Institute is vested with the same power to develop traditional knowledge and natural resources related to traditional healthcare.

The overlap between the right of IPs and the function of PITAHC poses an issue because it is a gray area wherein the loses its potency in the enforcement of the rights of the indigenous peoples. In a situation wherein two entities are vested with the same right, the stronger entity may be more successful in imposing their right or power. The PITAHC has been conducting development activities such as product development and pharmaceutical formulation. The institute was able to produce and market herbal medicine such as *lagundi, sambong*, and *tsaang gubat* tablets. Other products include herbal soaps and anti-fungal ointment. Consequently, the marginalized or the indigenous peoples may just forego the exercise of its right. This should not be the case. The State should facilitate social justice by tilting the law to favor those at a disadvantage.

Although the implementing rules and regulations prescribed for PITAHC provide for guidelines in the protection of indigenous knowledge systems, there is no mention of the role of indigenous peoples in the area of research and development. This creates a void on the enforcement of the right to develop of indigenous peoples. The same institute should facilitate the exercise of this right because it is the closest and most appropriate government body that can act as such.

In conjunction with the right to develop of the indigenous peoples, they also have the right to demand a share of financial benefit arising from its commercial use. Sy (2014) considers the concept of benefit sharing as both an economic benefit and measure for social justice. The law determines royalties as the form of benefit sharing (EO 247 Sec. 5(e)), which Sy (2014) notes as in the manner of the intellectual property rights system. The benefit sharing is discussed during the Pre-FPIC period and finalized in the Memorandum of Agreement. Joint DAO of DENR-DA-PCSD-NCIP Chapter VI (2005) provides the guidelines for benefit sharing agreements. Up-front payments are considered as advances to royalties; it is equivalent to US$1000 annually per collection site, over the collection period. Royalties are divided among the resource providers and the national government; seventy-five percent (75%) shall be paid directly to the resource providers and the remaining twenty-five percent (25%) to the appropriate government agency. The minimum amount of royalties to be paid is equivalent to two percent (2%) of total global gross sales annually for as long as in the market. Benefits are not

constricted to monetary terms alone; non-monetary benefits are also part of equitable sharing. Despite the law providing for these rules, the actual sharing of benefits is rarely realized. A probable reason is that resource users would not want to decrease their profit. In a 2013 study by assessing the implementation of FPIC in the Philippines, it observed that most of the issues concern economic benefits. It is further classified into two: issues on remittance of benefits and issues on who the recipients are (DENR). The same study was able to identify the research proponents and pertinent issues related to its project. In a mining-related project of Shenzou Mining Group Corporation (SMGC), the IPs complained that the corporation did not comply with the release of royalty payments as specified in the MOA. While with SR Metals, Inc., the problem is delayed payment and issues on sharing of royalty fees. Globe Telecommunications is also pinned for not following the payment of royalties and users' fees based on the MOA.

Also related to the development of traditional knowledge is ownership. Ownership is also a right provided in the said provisions of IPRA. Indigenous peoples shall have the right to ownership of both the intellectual right (R.A. 8371, Ch. V, Sec, 34), and the product (NCIP Adm. Order 1 (1998) Sec. 10). Moreover, a latter NCIP administrative order prescribing guidelines on research and documentation states that the community and research proponent shall have joint rights to all works and materials from such research, whether published or not. On the contrary, Rule IX Section 4 of the implementing rules and regulations of TAMA state that "all products and by-products derived from the Philippine medicinal plants using the resources and facilities of the Institute shall be the property of the Institute and the Philippine Republic." With respect to intellectual property rights, "the Institute shall develop its intellectual property portfolio in order to maximize the benefits of research and development" and "shall apply for IP protection for any material, products, by-products derived from medicinal plants including patents for processes utilized." There is a clear gap between the laws pertaining to the ownership of products and intellectual rights from the development of indigenous knowledge systems. To close the gap, the procedures for the enforcement of rights provided by NCIP Adm. Order 1 (1998) will be used. Rule IX, Section 2 of the said IRR states that "all doubts in the interpretation of the provisions of this Act, including its rules, or any ambiguity in their application shall be resolved in favor of the ICCs/IPs." With regard to the ownership of the product derived from the development, we follow that the ICCs should have joint rights with the research proponent, PITAHC, to all works and materials from the research.

With respect to the ownership of intellectual rights of indigenous peoples, the laws are contrasting in giving the intellectual rights to the indigenous community and PITAHC as a resource user. Intellectual rights are made to protect intellectual property by granting exclusivity to the owner. Certainly, two separate entities cannot have the same right, at the same time, for the same subject. The concept of intellectual property rights is the legal basis by which the indigenous communities are given community intellectual rights. Thus, following the IP system put in place, community intellectual rights have to be granted to the community. And in the application for these rights, social forces are unbalanced with the indigenous peoples at a disadvantage. Hence, the right to own their indigenous knowledge is not protected from biopiracy.

PITAHC, aside from conducting health-related product development of traditional knowledge, also documents Philippine traditional knowledge and practices on health. Simultaneously, the Institute is developing a Traditional Knowledge Digital Library (TKDL) on health. Documentation is conducted with the objective of protecting cultural heritage from disappearance and biopiracy. WIPO acknowledges documentation as instrument which may support benefit-sharing, preservation of traditional knowledge, and ultimately, the protection from biopiracy. The organization also differentiates preservation and protection; the former encompasses documentation for the maintenance of cultural heritage, while protection means defense against misuse and misappropriation.

Documentation comes in the form of databases and registers, and that they are tools for defensive and positive protection of traditional knowledge. Databases are "systematized collections of information, developed for public or private use." They are sources of information on prior art relevant to the review of patent

applications; it comes as a form of defense protection by preventing the grant of patents over it. Databases do not necessarily have to be freely open to the public, but others opt for it to expedite the search for prior art. It also does not give any legal right to the resource provider for its inclusion of information in the database, unlike in registers. It is argued that open access databases would merely increase the access of the private sector without increasing protection of the rights of IP. To prevent this, confidential registers are made; information included in this register is excluded from the prior art investigation. Registers confer positive protection to traditional knowledge because it entails recognition of legal rights over it, either under the intellectual property rights system or a sui generis one. (Alexander, M. & Chamundeeswari, K., et al, 2004)

Indigenous communities who will be partaking in the documentation of their knowledge and practices are given the option to preserve the gathered data within the community, share select data with a research institution with standard protective mechanisms, and to share select information in a TKDL which will be publicly disclosed. Moreover, the documentation of Philippine traditional knowledge and practices in health, and the TKDL in health is filed within the Philippine Health Research Registry. Traditional knowledge, by being documented and part of the TKDL is proved to be owned by the indigenous people. Therefore, it is being protected from the exclusive claims of the private sector. The TKDL can be used to contest the patent applications regarding the traditional healing practices, and even revoke patent already granted like in the case of India and a US patent on turmeric.

Under the coverage of the patent system, traditional knowledge will be protected by conferring legal right or title over the traditional medicine to the indigenous communities. Moreover, the indigenous community may enforce not only the rights given by the Intellectual Property Code but also by the IPRA. This is its advantage in contrast to the enforceable rights if traditional knowledge is considered as prior art and therefore not patentable. Traditional knowledge as part of prior art confers defensive protection by preventing others to obtain a title over their traditional knowledge. In this case, the indigenous communities may uphold only the rights under IPRA. A disadvantage of the patent system would be the fees to maintain the patent, which the indigenous communities might not be able to afford unless subsidized. Another disadvantage is that not all traditional knowledge can be protected under the patent system. Because of the nature of traditional knowledge, not all forms may pass the patentability test which includes novelty, inventive step, and industrial applicability. Moreover, the present Intellectual Property system separates traditional knowledge and traditional cultural expressions because their protection entails different policy issues but this distinction does not necessarily apply in their traditional context.

3.3 ASEAN Intellectual Property Rights Action Plan 2011-2015

The protection of intellectual property rights has been a growing issue across both developing and developed nations, especially with the advent of globalization and integration of different global economies. The main concern of the countries that are affected by these policy changes is the protection that is offered by these multilateral treaties, and to what extent this protection reaches. Scholars across South East Asia agree that because of the differing levels of development across the region, it is difficult to create a comprehensive protection system that addresses the needs of all the different nations at once. In other words, inclusivity is an ideal that could be hard to attain in the ASEAN. Despite this, the ASEAN took concrete steps towards the protection of its intellectual property. For this, they created the ASEAN Intellectual Property Rights (IPR) Action Plan 2011-2015; created mainly to address the different needs of each nation.

The IPR Action Plan 2011-2015 is the direct answer to the initial IPR Action Plan 2004-2010, which attempted to develop an intellectual property rights protection system which considered the different levels of development of each member state, as well as answers the needs of each of these countries. The 2011-2015 plan seeks to transform the ASEAN community into a competitive region that can be completely integrated with the global IP system. The plan was created to be a driving push for innovation and technological advancements in the region. To further discuss this plan, the ASEAN community drafted 5 strategic

goals that will help to globalize the intellectual property in the South East Asian region.

Because this paper focuses on the intellectual property, or traditional knowledge, of indigenous communities, the strategic goal that comes into play is strategic goal number 3, which primarily raises awareness for the protection offered to communities in the region. This also aims to increase the information disseminated across the region to create more competition, which is in line with the goals of the ASEAN Economic Community. Part of this goal is the protection of the resources and the traditional knowledge of indigenous communities; including their products and services. This is to preserve the national heritage and patrimony of countries in the South East Asian region. Each strategic goal embodies different initiatives, which is led by a main proponent country.

The third strategic goal includes in its initiatives the establishment of networks of patent libraries, the development of a campaign to raise awareness on technology transfer and commercialization, enhancing the capability of SMEs to generate and utilize intellectual property and the development of the ASEAN IP Portal. None of these initiatives specifically give protection to the traditional knowledge of the indigenous communities. This Action Plan is the only existing initiative of the ASEAN Community to protect intellectual property, aside from the protection that citizens may avail of in their respective countries. From this, it can be said that the ASEAN level protection that indigenous communities can avail of in the ASEAN level is not enough to protect their rights.

4. CONCLUSIONS

The quick rise in traditional and alternative medicine, such as herbal medicine or traditional healing practices, has given more importance to the protection of those who cultivate it. In the Philippine setting, current legislation has been a key factor in the protection of the rights of these communities, from their right to their land or ancestral domain, all the way to their traditional knowledge. The IPRA, working hand in hand with other laws such as the TAMA and the IP Code, have played an important role in the protection of their rights. Their traditional knowledge, being an important input in creating modern day remedies to diseases, has become an increasingly important input as well for pharmaceutical companies and governmental agencies. It has then also become vital to protect the traditional knowledge of these communities from the problem of Biopiracy, which is the illegal acquisition of indigenous knowledge and biological materials with the goal of capitalizing them.

In this paper, the researchers look deeper into the specific laws that give rise to the rights of these communities when it comes to their genetic resources and their traditional knowledge. The TAMA or the Traditional and Alternative Medicine Act is a tool by which the rights of these communities is protected. It includes provisions about the acquisition of the Free and Prior Informed Consent, as well as provisions regarding the development of their traditional knowledge and benefit-sharing. The researchers discussed the main issues that revolve around the said law, as well as the other laws that give rise to their rights, and examined if the current legislation in the country is an effective tool towards protecting their rights and ultimately, solving the problem of Biopiracy.

The NCIP AO 3 delineates the guidelines for obtaining the FPIC, as well as prescribes penalties for violations made in the process. The IPRA also prescribes penalties for these violations. These were meant to be a mechanism to protect the indigenous people more, especially because the FPIC process is made more rigorous, but because of the length of time needed to obtain this, many resource users choose to forego the process. This puts the indigenous people in the losing end of the stick. To some extent, the TAMA coupled with the IPRA protect these communities, but not as much as is originally intended. Biopiracy is still very much prevalent despite the obligation to obtain FPIC. It can be said that the TAMA does not produce ideal equitable terms for both the resource user and the indigenous peoples.

Aside from this, although the implementing rules and regulations prescribed for PITAHC provide for guidelines in the protection of indigenous knowledge systems, there is no mention of the role of indigenous peoples in the area of research and development. This creates a void in the enforcement of the right to develop of indigenous peoples. The same institute should facilitate the exercise of the right because it is the

closest and most appropriate government body that can act as such. The State should facilitate social justice by tilting the law to favor those at a disadvantage.

These ICCs are still not given maximum rights with regard to their benefit-sharing. Despite the law providing for a minimum term of benefit sharing to ensure protection, the actual sharing of benefits is rarely realized. Lastly, they should have joint rights with the research proponents, PITAHC, to all works and materials from the research.

Given that domestic legislation is lacking in the extensive protection of these vulnerable communities, the ASEAN Intellectual Property Rights Action Plan 2011-2015 is given focus, as its third strategic goal gives consideration to the protection of the works of indigenous communities. Even so, the framework encapsulated for the ASEAN region still fails to provide protection for the rights of these communities, with regard to their traditional knowledge. It lacks initiatives specifically for the protection of traditional knowledge.

The whole legislative system in the Philippines, as well as ASEAN, that is put in place to provide protection for indigenous people is protecting them to some small extent, but even so, no full protection is given to these communities. The advantage and priority is still somewhat given to the larger corporations. The failure of implementation as well as the vague and lacking provisions in the current system are susceptible to manipulation, and therefore could be cause for the presence of Biopiracy.

5. ACKNOWLEDGMENTS

The authors would like to acknowledge thier thesis adviser, Atty. Christopher Cruz, for sharing with us his knowledge on the topic which helped us formulate and complete our paper. They would also like to acknowledge their thesis panelists, Atty. Jayson Ramos and Atty. Augusto Bundang, for helping us improve our paper and for encouraging us to join this research congress.

6. REFERENCES

Afreen, S. (2008). Biopiracy and protection of traditional knowledge: Intellectual property rights and beyond. I*ndian Institute of Management Calcutta, 629.*

Agillon, A. (2007). Traditional Knowledge in the Philippines: Progress of IPR Protection. *Tech Monitor, Mar-Apr*.

Alexander, M. & Chamundeeswari, K., et al. (2004) The role of registers and databases in the protection of traditional knowledge: a comparative analysis. United Nations University – Institute of Advanced Studies. Annual Report 2015. (n.d.) Philippine Institute for Traditional and Alternative Health Care. Department of Health. Retrieved from http://www.pitahc.gov.ph/2014-10-10-00-40-25/vision/2015-annual-report

Ansari, M. H. (2016). Evaluation of Role of Traditional Knowledge Digital Library and Traditional Chinese Medicine Database in Preservation of Traditional Medicinal Knowledge. DESIDOC Journal of Library & Information Technology 36(2):73-78 http://publications.drdo.gov.in/ojs/index.php/djlit/article/view/9479/5574

Antons, C. (2005). Traditional Knowledge and Intellectual Property Rights in Australia and Southeast Asia*. Oxford: Hart Publishing*, 37-51.

ASEAN Intellectual Property Rights Plan 2011-2015 (n.d.) Retreived from http://www.ecap3.org/sites/default/files/IP_resources/ASEAN%20IPR%20Action%20Plan%202011-2015.pdf

Bautista, L. (2007). Bioprospecting or biopiracy: Does the TRIPS Agreement undermine the interests of developing countries? *Philippine Law Journal, 18*(1), 14-33.

Bengwayan, M. (2016). Companies rush to patent wildlife of the Philippines. *GMWatch.*

Bernas, J. (2011). The 1987 Philippine Constitution: A Comprehensive Reviewer. *Rex Book Store.*

Braendle, U. (2010). Theories of the firm. *University of Manchester*: United Kingdom.

Coase, R. (1937). The Nature of the Firm. *American Journal of Economics*: New York.

Collins, N. (2016). Lessons from Implementing Free Prior and Informed Consent (FPIC) in the Philippines: A Case Study for Teaching Purposes – Facilitator's Guide. *The* University of Queensland: Australia.

Croal, P. (2012). Indigenous and Local Peoples and Traditional Knowledge. International Association for Impact Assessment. Retrieved from https://www.iaia.org/uploads/pdf/Fastips_12_TraditionalKnowledge.pdf

Cruz, C. E. (2016). Intellectual Property of Indigenous Peoples (IP of IP): Challenges in Protecting Traditional Knowledge in the Philippines. De La Salle University.

CY 2016 Major Programs and Projects by Key Result Areas. Philippine Institute for Traditional and Alternative Health Care. Department of Health. Retireved from http://www.pitahc.gov.ph/attachments/article/75/2016_Programs_and_Projects_Beneficiaries_Status.pdf

Documentation of traditional knowledge. (n.d.) Retrieved from http://www.wipo.int/tk/en/resources/tkdocumentation.html

Free Prior and Informed Consent in the Philippines: Regulations and Realities. (2013). Oxfam America Briefing Paper. Oxfam: New York.

Garcia, J. (2007). Fighting Biopiracy: The legislative protection of traditional knowledge. *Berkeley La Raza Law Journal, 18(2).*

Goodland, R. (2004). Free Prior and Informed Consent and the World Bank Group. Sustainable Development Law and Policy, Summer, 66-74.

Hanna, P., Vanclay, F. (2013). Human rights, indigenous peoples, and the concept of

free, prior and informed consent. *Impact Assessment and Project Appraisal, 31(2),*

146-157.

Hobson, G. (1992). Traditional knowledge is science. Canadian Arctic Resources Committee. Northern Perspectives 20(1)

Hoff, K. and Stiglitz, J. (n.d.). Modern Economic Theory and Development. *American Journal of Economics:* New York.

Kariyawasam, K. and Guy, S. (2007). Intellectual Property Protection of Indigenous Knowledge: Implementing Initiatives at National and Regional Levels. *Deakin Law Review, 12*(2).

Morgera, E. (2015). An International Legal Concept of Fair and Equitable Benefit- sharing. *Edinburgh School of Law Research Paper Series.*

Navarro, B. (2010). Measuring Indigenous Peoples' Rights in the Philippines: The Metagora Experience. *National Statistical Coordination Board: Cordillera Administrative Region.*

Peria, E. (2015). Five reminders concerning traditional knowledge protection in the Philippines. Retreived from https://bitsinbits.wordpress.com/2015/03/16/5-reminders-concerning-traditional-knowledge-protection-in-the-philippines/

Philippine traditional knowledge digital library on health. (n.d.) Retrieved from http://www.tkdlph.com/index.php

Reyes-García, V. (2010) The relevance of traditional knowledge systems for ethnopharmacological research: theoretical and methodological contributions. Journal of Ethnobiology and Ethnomedicine 6: 32. http://link.springer.com/article/10.1186/1746-4269-6-32

Rodhouse, T., Vanclay, F. (2016). Is free, prior and informed consent a form of corporate social responsibility? *Journal of Cleaner Production, 131, 785-794.*

Rocha-Lackiz, A. (2005). Biopiracy: Is the patent system a solution? *SPRU-Science and Technology Policy Research.*

Sy, D.W. (2014) Protecting the Filipinos' knowledge on traditional medicine. De La Salle University. 83-84

Ward, T. (2012).The right to free prior and informed consent: indigenous peoples participation rights within international law. Northwestern Journal of International Human Rights, 10(2).

Wekesa, M. (2006). What is Sui Generis System of Intellectual Property Protection? African Technology Policy Studies Network.

What is intellectual property? (n.d.) WIPO Publication No. 450(E)

International Council for Science (2002). ICSU Series on Science for Sustainable Development No. 4: Science, Traditional Knowledge and Sustainable Development.

World Intellectual Property Organization. (2015). Intellectual Property and Genetic Resources, Traditional Knowledge and Traditional Cultural Expressions.

Zaipol, Z, et al. (2011). Biopiracy and states' sovereignty over their biological resources. *African Journal of Biotechnology, 10(58), 12395-12408.*