

**GLOBAL COMMONS: THE CASE OF INDIGENOUS KNOWLEDGE,
INTELLECTUAL PROPERTY RIGHTS AND BIODIVERSITY**

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Abstract

Globalisation brings with it different opportunities and challenges in the various sectors in which man is engaged. In the field of biological diversity , globalisation has several implications. Man depends on biological resources for his livelihood. However these resources are not evenly distributed on the face of the earth. It increases towards the equator. Incidentally, biodiversity is highly concentrated in the areas inhabited by third world countries. Developed countries are not as richly endowed with this resource as developing countries. However developed countries have developed technologies which enable them to manipulate biological resources to produce a variety of products which are used by man. Since these developed countries do not have much biodiversity from which to make these products they turn to developing countries. Biodiversity is not a product of man's creation hence developed countries have been and are still accessing these resources for free arguing that these resources are common heritage for the benefit of mankind. Developing countries have also held this notion. However the developed countries only define common heritage of biodiversity in terms of the raw product but once they make products out of it they then define it as "private heritage" which is not liable for sharing. They have developed protection mechanisms such as patents which prohibit others from benefiting. These patents are referred to as Intellectual Property Rights. Developing countries have since awoken to the reality of this unfairness and are advocating for benefit sharing with the developed countries on wealth created from resources originating from their territories. The Intellectual Property Rights designed by developed countries did not take into account the types of property held by developing country people such as innovations and knowledge based on their biological resources. Such types of property as is held by developing countries was also classified as products of common heritage. Global efforts are now being made from disadvantaged nations to redress the situation. Globalisation therefore presents a lot of challenges where appropriate institutions should be developed in which all people who contribute to biodiversity conservation and utilization get a fair share of the benefits derived from it.

Key words : global commons,, indigenous knowledge, intellectual property rights, biodiversity, globalisation

1. Introduction

This paper discusses issues surrounding the subject of intellectual property rights (IPR) and Indigenous Knowledge Systems (IKS) highlighting the salient features which makes the subject a thorny issue between developed and developing countries. Developed nations are creating wealth from biological resources which they get for free from developing nations. However the developed countries do not have much biodiversity compared to developing countries. The industrialized countries have developed biotechnology which they use to make commercializable products from biological resources. After developing products from the resources, developed countries invented property rights which they use to patent their products to prevent others from deriving benefits from these products.

The property rights developed by industrialized nations disregard property holding regimes founding in developing countries. Developing countries have more to lose under this system of property rights. This includes their innovations, knowledge and biological resources. This paper discusses the structural differences that are found between developing and developed countries with respect to how they relate to what is referred to as property. The paper also discusses how to overcome some of the identified challenges inherent in the differences. Cases of biopiracy where indigenous knowledge and resources were used by the developed countries without the consent and sometimes knowledge of the developing countries without compensation are highlighted.

2. Distribution of Biological Resources

The structure of the world's biodiversity shows a distribution pattern which is not uniform. G/Egziabher (2000) states that biodiversity increases towards the equator and decreases towards the poles. Industrialized countries are characteristically located in biodiversity poor regions in the North whilst developing countries are found in biodiversity regions mostly within the tropics. This characteristic distribution of developed and developing nations on the surface of the globe has led to the use of the terms North and South in describing these nations respectively. The industrialized

countries of the North, with their highly developed research facilities, see themselves as the hub of modern biotechnology. They are however biodiversity poor. The South are biotechnology deficient but are rich in biodiversity. Because of that, developing countries remain poor whilst developed countries enrich themselves from biological resources found in developing countries.

More than two thirds of the world's plant species – at least 35 000 of which have medicinal value – originate in developing countries (Crucible Group, 1994). Nijar (1996) also points out that between 300 000 and 750 000 plant species are thought to exist in the world with much of the diversity found in tropical zones. He also indicates that today's global food supply rests essentially on the biological diversity developed from wild plants and animals, savannas and the forests of the Third World. By and large these are raw materials for the North.

Despite the enormous benefits accruing to developed countries from biological resources which they get from developing countries, the developed nations are reluctant to develop benefit sharing schemes with developing countries. Because of their economic power and the desire to entrench their position, developed nations craft international laws which protect themselves. Their prime areas of interest are unhindered access to resources in the South and protection through patents of benefits arising from use of such resources. The challenge for developing countries is how to protect their biological resources from being accessed freely by developed countries as well as press for sharing of benefits derived from the use of these resources.

Apart from distribution of biodiversity between nations, there is also the issue of distribution at the regional or national level. This has implications in the design of benefit distribution mechanisms to those who actually manage biodiversity. Generally, miombo woodland has a higher species diversity than, for example, acacia woodlands (Biodiversity Support Program, 1993). Some southern African countries namely, Angola, Malawi, Mozambique, Tanzania, DRC, Zambia and Zimbabwe have miombo vegetation extending over 2.7 million sq. km. Within the individual countries themselves, such as Zimbabwe, biological resources are not evenly distributed either. The miombo

woodlands cover most parts of the central watershed. How will other communities not so richly endowed in biodiversity benefit, bearing in mind the fact that colonial practices were responsible for putting people where they now live? It is possible that some communities could have been displaced from areas rich in biodiversity to marginal areas despite their having contributed to conservation of such resources.

Biodiversity conservation has gained such prominence in all environmental agendas. All countries agree to the fact that Environmental issues are a global concern which needs a global approach. No individual country can tackle global environmental problems alone. Each country has a role to play in as much as each country has a share of global resources whose use by its subject has an effect on the global environment. However when one realises the unfair distribution in benefits derived from use of biological resources between developed and developing nations one is tempted to ask who should bear the cost of conservation between these two? What justification is there for a developing country to embark on biodiversity conservation programmes at their expense when developed countries are busy developing inventions based on such resources and then attach IPR over the use of the same resources? The TRIPSⁱ Agreement to which most developed countries are signatories allows patents and other IPRs on biological resources or knowledge of its use to be granted to any applicant in any country without the knowledge or consent of the country where such resources are found. There is also no provision under TRIPS for a patent holder on claims involving biological resources or related knowledge to share benefits with the state or communities in the countries of origin.

Given that all countries agree to the importance of biodiversity, there is need for a unified approach in terms of conservation and utilisation of biological resources. Given also that developed and developing countries are endowed differently, the former with biotechnology and financial resources and the later with biological resources, mutual support mechanisms must be expedited. Financial resources which have been made available through global facilities such as Global Environment Facility (GEF) should be accessed easily by developing countries to facilitate conservation programmes. Access mechanisms to these biological resources should be crafted through establishment of appropriate national legislation. Developed countries should also take a proactive role in helping the developing countries to craft such arrangements in the same way they do for conservation programmes. Developing countries therefore can benefit through both conservation programmes whose funding should not necessarily hinge on national legislation of such countries, and through benefit sharing arrangements with those accessing their resources. Independent environmental bodies dealing with biodiversity issues can be set up at country levels through which funds from global facilities can be channelled for conservation programmes. Bodies such as the United Nations Environmental Programme (UNEP) can play a more facilitative role in respective countries to ensure that developing countries especially, have accessed funds earmarked for environmental programmes.

3. Definition of Terms

3.1 Intellectual Property Rights – What are they?

Property is a claim to a benefit or income stream whilst property rights constitute claims to a benefit stream protected through institutionalised regimes from interference by other potential users (Kameri-Mbote, 2000). Property rights define the relationship, rights, responsibilities, between a holder of the property and the property itself. They also define the relationship between non-holders of the property and the property. IPRs are designed to confer ownership and specify rules of access over inventions, processes, and ideas (George and van Staden 2000; Swinson J. 2000). They are private legal rights that apply to the intangible human contribution that goes into the production of a particular technology (IUCN, 1994).

Distinction is made between tangible and intangible property as well as the rights pertaining to such property. Tangible property refers to real property that is made up of physical goods or commodities. An example would be a house, building or land. Intellectual property on the other hand deals with informational services that are intangible and amorphous, not readily susceptible to either possession or delineation (Kameri-Mbote, 2000). It is argued that real property is relatively scarce and therefore expensive to protect and capture, whilst on the other hand the value of intellectual property is associated with creation of shortage of information by limiting the capacity of non-owners to capture it. A major distinguishing factor between property rights as they relate to tangible and intangible property, is the aspect of time. Rights of an intangible property, such as intellectual property, have got a time period over which they hold. After the lapse of the time allotted the rights of the holder of Intellectual Property will no longer hold, meaning that anybody wishing to use the property can do so without fear of incrimination.

Information generated through intellect has the general characteristic that it is highly liable to use by others without paying for it. It is very difficult to limit or exclude others from this type of good. Under current intellectual property regimes, information of this nature is more of a public good. Production of an intellectual good, such as information, takes a lot of resources in the form of time, effort and even money. Since such resources have an opportunity cost associated with them, the person producing an intellectual good would need compensation for his/her investment. If the good is not protected to deny access to those who did not incur any costs in its production, others may use the good to produce other economic goods from which they will enjoy benefits. Intellectual property rights are therefore designed to facilitate and protect investments into generation of information so that those who would want to use their goods can reward investors for

their creativity. IPRs enable companies and individuals to legally protect themselves against counterfeiting of their products, technologies and services. (IUCN, 1999).

3.2 How Does One Define A Community?

The definition and identification of a community is a difficult exercise. Can one just go in the countryside and point at a community? Much depends on what one calls a community. There is great diversity within and among communities. There is therefore no standard community that can be taken as a stereotype to represent all other communities. The relationship between a particular community with its environment or biological resources differs from what one finds in the next.

Mayet (mimeo) indicates that there is no one definition of a local community. It can be defined in terms of shared social and economic relationships, the transmission of knowledge, values and customs. Some communities are said to define themselves in territorial terms or in terms of a particular natural resource or set of natural resources or in terms of shared activity. In Zimbabwe one finds two contrasting institutions at the local level. One is the government designed Village Development Committee (VIDCO) which is the basic unit of development. Before the creation of VIDCOs people were organized into communities headed by traditional lineage leaders. This unit of organisation is still existing alongside the state VIDCO system. These two types of organizational units tend to have command degrees of legitimacy from the local people depending on issues under consideration. They also have different boundaries. Matose et al (1996) observe that VIDCO boundaries often do not have any relevance to the socio-economic dimensions of the communities and so bear little relation to resource management terrains. In most cases VIDCO boundaries are said to have ignored cultural and social boundaries, splitting families and ignoring traditional grazing areas. The traditional unit of organisation does not have state mandate. Development agencies are said to work within the contexts of state created boundaries of VIDCOs. VIDCO leadership is based on elected representatives whilst that of traditional leaders is based on heritage or descend.

Since sustainability in local based resource management is guaranteed where there is participation, the local people should be consulted on how they would want to organize themselves between the two types. It however seems appropriate to use the traditional setup since it is more related in its constitution to resource distribution. However the people who will lead the company should be chosen on the basis of ability rather than heritage.

3.3 Types of Intellectual Property Rights

IPRs generally fall into the following categories; copyrights, trademarks, trade secrets, industrial designs, geographical indications and patents (Kameri-Mbote, 2000). Products and technologies that are protected by property rights are major exports of most developed countries as well as are the rights themselves in the form of licenses to use patented processes, techniques and designs, copyrights and trade marks.

3.3.1 Copyrights

Copyrights protect the creative expression of ideas in tangible form. They are extended to scientific publications, computer software and databases. These generally require no formalities to obtain. In most countries as soon as one writes they are protected by copyright (Swinson J. 2000).

3.3.2 Trademarks

Trademarks protect symbols, words and marks that are designed to distinguish goods and services of one person or company against those of the other in the market (Kameri-Mbote, 2000; Swinson J. 2000).

3.3.3 Trade Secrets

Trade secrets are used to protect subject matter, which is either unpatentable due to failure to fit into the requirements for patenting, or because the holder of such information does not want to publicly reveal the subject matter fearing that a competitor may commercially use the information to the holder's disadvantage.

Examples of information that can be protected through trade secrets are scientific information or a traditional healers' knowledge. Trade secrets differ from patents in that trade secrets do not prevent others from developing and using the same information in a different way.

3.3.4. Plant Breeders Rights

Plant Breeders Rights (PBRs) are rights granted to plant breeders to exclude others from commercialising material of the plant varieties they have developed (Mpofu, mimeo). For a plant variety to be eligible for protection through PBRs, it must be clearly distinguished from other protected varieties, uniform and stable. PBRs are designed to attract the private sector into engaging in plant breeding activities. They are also designed to allow other plant breeders to use the protected plant for their own breeding activities and research as long as they refrain from selling the protected plant itself.

3.3.5 Patents

Patents confer exclusive rights on an inventor which, for a fixed period, prevent others from producing, using, or engaging in commercial transactions for the inventionⁱⁱ. A patent requires that an invention be novel, or recent and original, and not previously known. The product or process should not be a trivial extension of what is already known. When a patent is granted, the inventor is given a private monopoly for a fixed duration to restrict others from making, using, or selling the invention. The applicant for a patent must include a full written description of the invention. In exchange for the patent, the patent's subject matter should be published. The TRIPS agreement stipulates that the term of patent protection should be no less than 20 years from the filing date of the patent application (IUCN, 1994; Kameri-Mbote, 2000)

3.3.6 Utility Patents and Plant Patents

Utility Patents provide protection for agricultural research products such as herbicides, insecticides, fungicides, transgenic plants, plant cells, plant genes, plant DNA sequences, plant tissue cultures, transgenic seeds, plant varieties, host vector organisms and many other products of agricultural research. Within Utility Patents are Plant Patents that apply to single variety of plants. However biologists are not happy with single plant patents arguing that they do not provide protection for broad inventive concepts especially with biotechnology where new traits such as for insect resistance cannot be confined to a single plant variety (Duffey, in Weaver 1993).

3.4 Indigenous Knowledge (IK) – What is It ?

Indigenous Knowledge refers to the local knowledge by indigenous people that is unique to a given culture or society. It forms the basis on which local decisions on fields such as agriculture, education, health, natural resources management and others are made. Such people depend on specific skills and knowledge that have been influenced by internal creativity and experimentation for their livelihoods over a long period of time (Warren, 1991; Flavier et al. 1995, in World Bank Website for Sub-Saharan Africa). While such knowledge is of value to the owners, it is also of value to the world economy as it forms part of the global knowledge. A major distinguishing characteristic of indigenous knowledge is that it is intergenerational. It is handed over from one generation to the next. Those who hold the knowledge hold it as if it were in trust for future generations. It has been preserved, transferred, adopted and adapted in many situations as development process interacts with it (World Bank Website). Indigenous knowledge has gained prominence of late as people realise the role it has played over time in preservation of biodiversity. Mariam Mayet (mimeo) describes traditional knowledge as any knowledge, innovation, or individual or collective practice of an indigenous population or local community, having real or potential value, associated with a biological resource, protected or not by intellectual property legislation.

The term Indigenous or sometimes Traditional Knowledge seems to refer to that body of knowledge held by people who are not regarded as “developed” as far as modern science and civilisation is concerned. Wherever this term is mentioned it is usually in relation to natives of a country or region whose history involves some kind of marginalisation at one point or another from “modern civilisation”. Indigenous Knowledge is therefore a term based on value judgment as to its quality, complexity, origin and other parameters. This type of knowledge does not command the same status as what is referred to as “formal scientific knowledge”. The question is *Who* classifies knowledge as indigenous or formal? Matose and Mukamuri (1993) argue that knowledge is constructed in relation to history, culture, economics, politics and most importantly power relations. Those who are politically, socially and economically disadvantaged, the powerless, are forced to accept without question the knowledge of the powerful. What the powerful know then becomes the yardstick against which all other knowledge is measured. The rich and powerful therefore bestow upon themselves the prerogative of acknowledging or recognising knowledge as knowledge or otherwise.

The packaging of knowledge into what is called “indigenous”, “local” or “modern scientific/formal” influences the value that will be attached onto such knowledge. Knowledge systems are framed within the discourses of power where the powerful subdue the weak (*Ibid*). They also argue that the way knowledge attains value is dependent on the world’s hierarchies which define the knowledge of “the other” (for instance rural, illiterate people” as inferior to the knowledge of “the self”. How then can Intellectual Property Rights derived from the superior domain benefit to the poor and powerless ?

It is quite apparent that traditionally, intellectual property rights regimes did not attach any value to indigenous knowledge to warrant its protection as property. This is one reason why globalisation poses dangers of impoverishing traditional or cultural societies if their knowledge is not accorded a status befitting any other body of knowledge. Gupta (mimeo) points out that people's knowledge system need not be considered informal just because the rules of the formal system fail to explain innovations in another system.

Developing nations are involved in a game over biological resources with an opponent (developed nations) who is both player and referee. In the Convention on Biodiversity developed countries were pushing for the view that biodiversity be regarded as common heritage that should be exploited and conserved for the benefit of all mankind (Kameri-Mbote, 2000). This would guarantee their access to biological resources. However these nations are not willing to share the benefits derived from products developed from such resources. Such products are exclusively patented. A contrasting view on common heritage between developing and developed nations is manifested. Indigenous communities have always regarded biological resources as common heritage which should be shared for the benefit of all. This they did without disadvantaging others. Developed nations on the other hand advocate for common heritage where benefit for all is limited to access to the resources but not what is derived from them.

In developed countries resources, biological or intellectual property, are defined and controlled in terms of either individual or corporate ownership. Most resources can be traced down to either of the above entities. Traditional communities such as those found in Africa do/did not keep their knowledge documented in written form. Their knowledge is oral based, passed on from one generation to another. The African Model Legislation for the Protection of the Rights of Local Communities, Farmers and Breeders and for the Regulation of Access to Biological Resources (2000) states that "farmers' varieties and breeds are to be recognized and shall be protected under the rules of practice as found in, and recognized by, the customary practices and laws of the concerned local farming communities, whether such laws are written or not (Mpofu, mimeo). This shows how developing countries can take a unified stance as a way of making their knowledge accepted as property. Actually, the rules governing the development of international law do enable states especially when they function as a voting block, to influence its evolution (Egziabher T, 2000). The possible options out of the intellectual property rights quagmire that developing countries face is either;

- 1) To transform the laws that establish the current IPR regimes or
- 2) To transform the institutional structures which has to do with IPRs e.g. local communities and their relationship with biodiversity and indigenous knowledge, to fit in the current framework of IPRs, or
- 3) Both.

4. Transforming International IPR Laws to Incorporate Developing Countries Needs

Africa has already started exerting unified pressure to influence evolution of international law to be responsive to the situation of developing countries. For example, in the Conference of the Parties of the Convention on Biological Diversity, Africa's delegations convincingly argued that the Convention should have supremacy over TRIPs. It is believed that this will influence the development of TRIPs and WTO. The other fora where Africa is reported to have taken co-ordinated efforts to present their common stance on aspects of biodiversity are;

- OAU Summit in Ouagadougou in 1998;
- The African, Caribbean, Pacific and European Union Joint Assembly in 1998;
- The United Nations General Assembly;
- The World Trade Organisation Ministerial Conference in Seattle in 1999;
- The Biosafety Protocol in Cartagena, 1999, and
- The International Undertaking on Plant Genetic Resources for Food and Agriculture in 1997 and 2000.

Another way to further strengthen their advocacy as a voting block to influence international law is that special task teams comprising professionals in this field be constituted dealing with biodiversity on a more subject matter basis. Such teams can be constituted on the basis of countries where particular biological resources are found. Such task teams can define the broad regional frameworks from which individual countries can develop their own access and benefit regimes. This recommendation is made in the light of the observation made by Egziabher (1996) when he attended an intergovernmental negotiation session on Biological Diversity in 1992, Nairobi. He observed that the delegates of the South were often too few to be effective. They had to deal with multitudes of disciplines for most of which they had had no educational background. The delegates from the North came mostly in large multi-disciplinary teams. They also came equipped with comprehensive data bases whilst those from the South had to rely on their own knowledge intuition.

The Convention on Biological Diversity and TRIPS have different objectives. The CBD is driven more by the need to conserve biodiversity and the need to acknowledge the role of indigenous/traditional knowledge. In this respect it is sympathetic to the plight of developing countries. On the other hand TRIPS is a commercial treaty with commercial objectives that largely benefit strong private firms (Third World Network, 2001). Some of the provisions in CBD are not in the interest of TRIPS. If a country under TRIPS could increase its profits from a patented product without sharing any of those benefits with the country of origin, it would gladly do so. In this regard one can not expect to see TRIPS advocating for benefit sharing since this will be a counterprofit move. There is therefore need for a merger of bodies such as CBD and TRIPS into a Global Organisation which addresses both issues under one umbrella. There is no way global biodiversity issues can be solved using counter-objective groupings. Such a global organisation should then include all stakeholders.

Whilst under CBD sovereignty of countries is enshrined this tends to contradict globalisation. If a biological resource is defined as being global as far as conservation and utilisation is concerned sovereignty will have the effect of limiting globalisation to its borders. If there is universal agreement as to the need for conserving a specific biological resource, such as the need to preserve elephants and banning of trade in its products, how would one interpret national sovereignty as enshrined in CBD? This issue of state sovereignty and common heritage within the context of globalisation could be a contributory factor to difficulties faced by developing countries in accessing funds meant for biodiversity conservation and utilisation programmes.

5. Transforming Local Institutions to fit in the Current Framework of IPRs

5.1 Structural Differences Between Traditional and Western Institutions in their Relation to Property

Individuals, households, communities and indigenous groups all articulate a historical and cultural set of claims over the access to and control over territorial resources to secure livelihoods from their local environmental inheritanceⁱⁱⁱ. A community has

historical attachments and entitlements over environmental resources, indigenous institutions and customary rights and practices which control access to and regulation of resources. Community rights to the control of natural resources including bio-diversity, knowledge and technologies existed before private rights were conferred on these resources (Mayet, mimeo).

Western IPR systems are based on private rights. Collective knowledge or rights are only recognized if the community is a company. This fact demonstrates the shortfalls associated with the system of granting IPR to traditional communities based on ‘modern’ societies. Traditional communities come from and are characterized by a background of sharing, where genetic resources, for example, are treated as common property. Since time immemorial, Africa’s people have depended upon free and open access to that diversity of food, fuel, medicine, shelter and economic security, exchanging and trading of such resources among themselves. Information and seeds have always been shared between farmers. Knowledge and experience are communally owned. The concept of property rights did not exist (Trygve Berg, mimeo). Gupta (mimeo) highlights that a large number of local communities across the world have shared unhesitatingly their knowledge about local biodiversity and its different uses with outsiders including researchers, corporations, gene collectors and activists. As if sharing was not enough, a large number of herbalists do not even accept any compensation when offered (*ibid*). In some cases the communities have cultural and spiritual taboos against receiving compensation because of the fear that effectiveness of their knowledge would cease if they received any payment for it. Because of their inability to comprehend such complex community setups and how they relate to their biological resources, many colonial authorities in African countries removed rights to resources from communities and vested them in individuals as a prerequisite for legal protection (Kameri-Mbote, 2000). This means that as long as resources are not owned by an individual or company there are no binding ownership rights hence access to such resources is open to all.

5.2 Problems faced by Local Communities in their Countries

The problem which most local communities in developing countries face is that most national governments inherited systems of governance from colonial regimes which had removed responsibility of management

of natural resources from indigenous people to the state. The local people who had for centuries managed their resources through local institutions were removed from their dwelling places to give way to tenurial systems based on private rights and placed in infertile and fragile environments. The system of management of biological resources which the local people had developed in their original areas was interfered with. Colonial governments enacted various pieces of legislation for the local people which were meant to conserve resources as traditional practices were now viewed as ecologically unsustainable. The new legislation was a top down approach.

In Zimbabwe such current legislation which was inherited at independence partly acknowledge the role of local people in the control of resources such as trees (Nhira, Baker, Gondo, Mangono and Marunda, 1998). As regards natural resources management, the government has decentralised power to local government levels through community-based approaches for natural resources such as wildlife and water resources (Nhira et al, 1998). Government is, however, reluctant to devolve governance of resources to the local level. The more that communities are able to control land and natural resource use, the less government can prevail in installing its approach to economic development in local contexts (*ibid*). In Zimbabwe governance has only been decentralised to Rural District Councils (RDCs) who have little appreciation of the concerns and conditions at local levels. Empowering local communities with the responsibility of managing the resources is difficult in the face of existing legislation. According to Biodiversity Support Program (1993), because of the historical antecedents of today's protected area system in Sub-Saharan Africa, the attitudes of local people living near national parks and reserves often reflect suspicion and mistrust of conservation policies.

Should the state therefore be mandated with the management and conservation of biological resources and distribute benefits derived from their use to the local people? Nhira et al (1998) state that the government has neither the capabilities nor the means to effectively manage natural resources at the local level. Gupta (mimeo) points out that most governments have very weak commitments to make the machinery of government accountable to local disadvantaged communities. Entrusting the task of routing compensation from national or international funds through governments is therefore said to be counterproductive. In Zimbabwe the CAMPFIRE programme have provided important lessons on what the state can do. Though there is still need to decentralise responsibility beyond the Rural District Councils the programme has demonstrated how the state can spearhead programmes where communities benefit from management of natural resources. The state should therefore take the initial responsibility of protecting all biological resources from exploitation by outsiders and also establish the right institutional environment whilst issues of decentralisation and management are worked out. How then should traditional institutions be transformed to conform to current IPR legislation ?

5.3 Transformation of local institutions to fit in Current IPR Regimes

Since some traditional communities still have ethics prohibiting acceptance of compensation for knowledge or for granting access to biological diversity there is need for mental overhaul. This can be done through raising awareness programmes on the realities of globalisation and its implications on their resources and livelihoods. Given that most communities are now dependent on the cash economy one does not expect much resistance from them.

On the issue of knowledge and resources, whose ownership and management responsibility is the community, it is recommended that communities be assisted to register as companies. This makes the community eligible as a legal owner of resources under it as far as the current IPR regime is concerned. Since African countries have already made presentations through OAU at the Conference held in 1998 in Ouagadougou, for recognition of community rights and on access to biological resources, countries can start implementation of such structures. Directors can be appointed by these community-cum-companies to represent them as well as assist them in managing the biological resources. The directors, who should preferably be professionals in such fields, will have the responsibility of documenting all property and resources including indigenous knowledge which can be patented to the community-cum-companies. It is necessary that there be lawyers among the directors so that they can produce legally binding documents for the community. Since most communities may not have the financial capacity to employ the trustees it is recommended that either the state or relevant Non-Governmental Organisations (NGOs) be initially responsible for the support needed. The setup can borrow relevant principles from the Communal Areas Management Programme for Indigenous Resources (CAMPFIRE)^{iv}. In most countries of Southern Africa, there are Community Based Natural Resource Management (CBNRM) Programmes already underway implemented with the support of NGOs and other development institutions. These programmes should be promoted as ways of capacitating the local people in sustainable resource management.

The rationale behind engaging directors for the proposed companies is that while local communities may not have problems in managing biological resources in their territories given good support, they certainly do not have the capacity, in the short term, to draft access rules and benefit sharing mechanisms for global

clients. If natural biological resources are being expropriated by developed countries from developing countries under state management it means that local communities will need professional technical support.

An alternative to a system of directors as managers of the proposed community natural resource companies is to have some members of the community form and register a company in which every community member has a share. All families in the community will be eligible to join in the company meanwhile the formed company becomes responsible for all community property in their jurisdiction. The shares allocated can be used as the basis for distribution of benefits arising from commercial use of resources owned by the proposed company. Whilst there may be certain requirements for registration of a company it must be clear from the onset that we are not immediately envisaging a company that fits the expectation of a stock market investor. These will be special community natural resource companies which are nationally and internationally recognized legal owners of biological and other resources found within their geographical areas of jurisdiction. Developing countries can develop legislation covering formation and management of these specific companies. The important thing is to set up a legally recognized body for ownership and control of biological resources including indigenous knowledge. This will help in closing the gap through which resources are pirated without compensation allegedly because there is no owner.

6. Piracy of Indigenous Knowledge

There are several incidences which show that indigenous knowledge is being pirated by the developed nations with their highly developed and sophisticated research laboratories whilst the developing countries are lagging behind still trying to make a case for their knowledge. The contribution of indigenous knowledge to the development of products through what is regarded as formal modern science is quite astounding.

Nijar (1996a) points out that three quarters of the plants that provide active ingredients for prescription drugs came to the attention of researchers because of their use in traditional medicine. He states also that of the 120 active compounds currently isolated from the higher plants and widely used in medicine today, 74% show a positive correlation between their modern therapeutic use and the traditional use of the plant from which they were derived. Traditional knowledge is said to have increased the efficiency of screening plants for medicinal properties by more than 400%.

The current value of the world market for medicinal plants derived from leads given by indigenous and local communities is estimated to be US\$43 billion (*ibid*). Nijar (1996b) further states that the value of crop varieties improved and developed by traditional farmers to the international seed industry is estimated to be US\$15 billion. One wonders whether all such contribution from the traditional knowledge was ever acknowledged. Despite all this invaluable contribution to the creation of wealth for them, the North continues to view indigenous knowledge with little regard. Classification of indigenous knowledge as unpatentable by the North is just a strategic gimmick meant to guarantee them free access to it as a product of the commons.

In Zimbabwe there is a current debate underway involving the University of Zimbabwe, the Zimbabwe National Traditional Healers Association (Zinatha), the University of Lausanne in Switzerland and an American pharmaceutical company, Phytera over a patent on the use of the root of a certain tree called *Swartzia madagascarensis* which is found throughout tropical Africa. According to a Press Statement of August 2000, a patent on antimicrobial diterpenes was granted to a professor at the University of Lausanne. The patented invention relied on traditional knowledge found in Zimbabwe regarding the use of the root of *Swartzia madagascarensis*. An agreement is said to have been signed between the University of Zimbabwe and that of Lausanne stipulating that “in the event of finding any product which may require the application of intellectual property rights, this will be subject of joint negotiation and application”.

In 1997 an addendum to a material transfer and confidentiality agreement between an American pharma company called Phytera and the University of Lausanne is reported to have been signed where the two parties agreed to a royalty payment of 1.5% of Phytera’s Net Sales of the specific product. The Researcher was obliged to share 50% of any royalties with the National Botanic Garden of Zimbabwe and the University of Zimbabwe. Both the University of Zimbabwe and Zinatha were not involved in these negotiations between the University of Lausanne and Phytera. It is quite clear from this case that Zimbabwe as the country of origin of the biological resource, was not going to benefit much from the arrangement. Zimbabwe challenged this arrangement through several NGOs, demanding that an Access and Benefit Sharing agreement be negotiated including all the main stakeholders in Zimbabwe, and that the contract between the University of Lausanne and Phytera be cancelled and the patent withdrawn. However negotiations are still underway.

Zimbabwe does not yet have legislation in place which adequately addresses the issues of access and benefit sharing for biological resources found in her territory. Anybody can therefore access biological as well as other resources such as indigenous knowledge and develop products and patent them and still be guiltless as far as national laws are concerned. Whilst international provisions as enshrined in bodies such as the CBD stipulate that access to genetic resources and indigenous knowledge be subject to prior

informed consent of the country of origin, developing countries such as Zimbabwe still need to develop relevant legislation in this regard.

Trygve Berg (mimeo) discusses about two situations where biological development stock was taken from Africa and new varieties developed for the benefit of those countries without any benefits being repatriated to the source countries. In the first case the International Centre for Tropical Agriculture (CIAT) based in Columbia has a forage-breeding programme targeting needs in Latin America. This centre works with African Species. When the centre started a breeding programme on a *Brachiaria* species they found locally available materials to be genetically narrow and therefore unsuitable as source materials for breeding. They collected new accessions from Africa to broaden their genetic base of local varieties through breeding programmes at CIAT. The source countries in Africa never received any benefits from this development.

The other case involved the Nile Tilapia (*Orichromis niloticus*), a particular type of fish found in the Nile. This species was introduced to Asian countries from Egypt some forty years ago. Aquaculture candidates in Asia were highly inbred and uniform and were not responsive to selection. A programme of breeding to improve farmed Tilapia was started at the International Centre for Living Aquatic Resources Management (ICLARM) and fish farming with the African species soon grew to a major industry. Fresh introductions from streams and lakes in Ghana were made available to broaden the genetic base of *O. Niloticus*. Today, the Nile Tilapia is the basis of a multi-million dollar aquaculture Industry in Asia. But neither Egypt nor Ghana has benefited from this development at all.

Chitsike (1997)(*ed*) highlights biopiracy involving Quinoa, a high protein cereal which forms an important part of the diet of millions of indigenous people in Andean countries of South America, and turmeric, – an orange rooted plant found in India. In the Quinoa case, he reports how the Andean Countries people have cultivated and developed different varieties of this plant. Because of its nutritional value, which has twice the protein content of maize or rice, quinoa has started to enter the US and European markets. Every year Bolivia is reported to get US\$1 million from the sale of this product. In 1994 two researchers from the US received a patent which gave them exclusive monopoly control of male sterile plants of the traditional Bolivian “Apelawa” quinoa variety. The researchers are said to have admitted that they did nothing to create the male sterile variety. It was “ just part of the native population of plants”. The patent covers any quinoa hybrid derived from Apelawa male sterile cytoplasm including 36 traditional varieties. Once the patent finds its way into corporate hands, Bolivian exports of quinoa to the US can be prevented and quinoa can be grown commercially elsewhere with the permission of patent holders.

On the turmeric case it is reported that this plant is a magic cure-all for many people in India. The turmeric plant, which is orange rooted is an ancient component of ayurdermic medicine, is native to the subcontinent and has been used for thousands of years in the treatment of sprains, inflammatory conditions and wound healing. In 1995 two US scientists from Mississippi were granted US patent on the use of turmeric for healing wounds. Though the government of India filed a challenge to the patent, the appeal can be upheld if India provides proof that turmeric has been used in India specifically for healing wounds. This proof should be in the form of an academic paper which predates the patent application. The US researchers are said to have acknowledged in the application for the patent that turmeric has long been used in India as a traditional medicine for treatment of various sprains and inflammatory conditions, but, they argued that *there was no research done* to that effect. So, if the patent could be granted on the basis that the process that had led to its discovery and use by the people of India could not be regarded as research, this means that all traditional based knowledge can not be patented. The implication is that any scientific researcher who can take traditional knowledge, verify it through a recognised scientific research process, without adding anything more, can apply for a patent to his/her benefit.

The Neem tree which is found in India has now more than 35 patents on it in the US and in Europe for its pesticidal properties (Chitsike,1997). Local communities who have been with this plant and have preserved it for generations are already marginalized because of reduced access to this resource due to high market demand. If the 35 patents were for Indian nationals or corporations nobody would raise questions of biopiracy but probably the distributional aspects within the country.

Some research techniques used in rural development initiatives facilitate expropriation or pirating of indigenous local knowledge. Some research agendas and programmes carried out in the context of development institutions such as universities, NGOs and other rural development oriented institutions through various bilateral and multilateral co-operative programmes are flow channels through which Indigenous Knowledge is siphoned to developed countries where it is used to develop commercializable products. Dery, Otsyina, and Ng'atigwa (eds) (1999)^y highlighted that knowledge of traditional medicine is a treasured secret of some individuals. This means given the chance such individuals could patent such knowledge. Western laws of property rights have mechanisms of protecting such treasured information such as trade secrets. In order to extract this treasured information from people from local communities in developing countries special extractive tools were and are being developed commonly referred to as Participatory Research Methods. This is not to say these methods are bad but, they can be misused. These methods have inbuilt mechanisms to tease out valuable information from local people. No payment is made for this knowledge implying that such knowledge is common heritage. Publications from such acquired knowledge is patented by the authors. The communities supplying the knowledge may receive acknowledgments.

The often revealed objective of wanting to better understand the local communities so as to be able to come up with appropriate development programmes is quite novel but the knowledge derived from such efforts has far more beneficial consequences to the developed countries sponsoring such programmes.

In some research studies conducted in Tanzania Dery *et al* (1999) established that people from Shinyanga Region still rely heavily on over 300 tree species for treatment of a variety of diseases. From these people they were able to list the names of the trees used^{vi} in terms of local name, botanical name, the part of the tree used as well as the disease treated. Such valuable information was provided at no cost and the people who supplied the knowledge did not get any rewards for it let alone patenting it. The authors actually admitted that they were greatly surprised at the eagerness with which many traditional healers were willing to release information on the medicinal values of the tree species.

The objective of the exercise which resulted in the availing of such knowledge by local farmers was to identify, document the wealth of knowledge on medicinal trees and to domesticate the identified priority medicinal trees (PMTs) and evaluate ways of integrating them into existing farming systems in the miombo woodlands of Southern Africa. This was expected to increase the availability of scarce medicinal products to traditional healers and farmers, raising their income, reducing pressure on wild tree populations and contributing to better health care. It is anybody's guess what this information means to a scientific researcher – priceless research clues for developing commercial products.

When developed countries use such indigenous knowledge as input to their research processes and develop commercializable products, they have the capacity to alternatively develop synthetic substitutes to what they will have found through indigenous knowledge.

Chitsike (*ed*) (1997) reports on a case of biopiracy involving a West African berry called, Brazzein. This berry contains a protein which is 500 times sweeter than sugar. Brazzein is a natural substance and does not lose its sweetness when heated. It is therefore valuable in the food industry. Researchers at the University of Wisconsin have received US and European patents for protein isolated from this berry. Subsequent work on the protein focussed on making transgenetic organisms to produce brazzein in the laboratories thereby eliminating the need for it to be collected or grown commercially in West Africa. The university of Wisconsin is said to have reported that corporate interests in brazzein is very strong adding that the world-wide market for sweeteners is US\$100 billion a year. The university was quite clear that the brazzein is an invention of a University of Wisconsin – Madison Researcher and that there were no plans for benefit sharing with the West African people that discovered and nurtured the plant. This is how local indigenous people lose out.

7. Conclusion

Developing countries really need to craft their way in order to prevent their resources from being siphoned to the North without benefits on the use of such resources flowing to the South. As already highlighted the ability to have IPR laws changed for their benefit lies in their co-operation. Developed countries themselves worked in co-operative blocks.

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ⁱ Agreement on Trade Related Aspects of Intellectual Property Rights.

ⁱⁱ Mariam Mayet, Freelance environmental lawyer, based in Johannesburg South Africa, *Securing sustainable livelihoods: Imperatives underpinning the development of an appropriate regime to protect community rights to biodiversity* mmayet@global.co.za

ⁱⁱⁱ Watts (undated)

^{iv} CAMPFIRE – Communal Areas Management Programme for Indigenous Resources. Originated in the 1980s though it was officially incepted in 1989. A brain child of the Department of National Parks and Wildlife Management the programme seeks to place the proprietorship of natural resources in communal lands with local communities, based on the supposition that through direct benefits derived from their management of these resources, communities would perceive a vested interest in their conservation (Nhira et al, 1989).

^v Dery BB, Otsyina R, Ng'atigwa C, eds. 1999. *Indigenous Knowledge of Medicinal Trees and Setting Priorities for their Domestication in Shinyanga Region, Tanzania*. Nairobi: International Centre for Agricultural Research.

^{vi} Ibid, Appendix 5, Main data list shows all these plants.