International Journal of Advances in Engineering and Management (IJAEM)
Volume 4, Issue 3 Mar 2022, pp: 281-283 www.ijaem.net ISSN: 2395-5252

Bioprospecting: Effective Bioprospecting Regulation Framework in Africa

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Submitted: 01-03-2022 Revised: 10-03-2022 Accepted: 12-03-2022

ABSTRACT
The Paper conceptualize the issue of effective bioprospecting regulation framework as a global challenge and issue of great concern to the entire world at large. The paper also emphasized on the concept and processes involved in bioprospecting. The researchers carried out oral interviews with the Staff of Forestry Department College of Agriculture, Ganye, Adamawa State Ministry of Environmental, Agriculture, Livestock, Department of Natural Resources from Local Government Areas and Staff of Gashaka Gumti National Park Tongo sector, the findings revealed that there is wide range of sectors undertake research and development of commercial products from genetic researches. The genetic materials and associated knowledge are accessed through botanical gardens, Universities, Research Institutions, laboratories, gene banks and culture collections. Recommendation was made that they should formulate a good Access and Benefit Sharing (ABS) policy remains one of the major challenges to African Countries realizing these benefits, enhanced market and scientific research can clarify issues and raise the awareness of the key stakeholders. Institutionally, measures to build capacity should include ensuring that appropriate legislative and/or regulatory measures are in place to support ABS agreements, integrating ABS into biodiversity strategies developing and sharing model commercial ABS agreement.

Keyword: Bioprospecting, Regulation, Biodiversity, Protection, Conservation.

I. INTRODUCTION

Bioprospecting or biodiversity prospecting can be defined as research, discovery, development and commercialization of valuable genetic resources and their derivatives. Bioprospecting and biotechnology industries are fully dependent on biodiversity richness -defined by the convention on Biological Diversity as the variability among living organisms from all sources including inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part, it includes diversity within species, between species and of ecosystems. It can also be looked at as the total variety of life on earth, including genes, species, and ecosystem and the complex interactions among them.

There are several processes involved in bioprospecting:

i. Discovery that involves the collection of biological samples and testing for required activity or properties;
ii. Identifying active chemical and biochemical compounds of potential value;
iii. Development that involve optimizing effectiveness, safety and costs;
iv. Trials including both field and clinical;
v. Developing cost effective production systems for the products and;
vi. Commercialization - sales and marketing of products from biodiversity.

Africa has unique and diverse flora and fauna. Africa wildlife has been recorded as being among the richest mega biodiversity in the world. Biodiversity inventories have not been comprehensively done. African coast, rich in marine and coastal life forms - boast of over 800 species including 169 species of corals, 9 species of mangroves and 344 species of mammals not to mention the countries number of species not yet described or discovered (Croso, 1999). High degree of biological diversity and endemism and level of taxonomic knowledge about the species make the country attractive to bioprospectors.

Bioprospecting is one possible avenue to leverage Africa's biodiversity, promote conservation and

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livelihood through bio-economy development, according to experts (FAO, 2008). However, there is need to undertake the countries biodiversity resource valuation and establish leads for product development and commercialization. Mapping the countries biodiversity and zoning them will be useful for bioprospecting.

Effective Bioprospecting Regulation Framework

A wide range of sectors undertake research and development of commercial products from genetic resources. These products range from pharmaceutical, biotechnology, seed and crop protection, horticulture, cosmetics, personal care fragrance and flavor, botanical to foods and beverages. Currently most of the genetic materials and associated knowledge are accessed through botanical gardens, universities, research institutions, laboratories, gene banks and culture collections (FAO, 2008). The Bonn guidelines set minimum standards for ethical bioprospecting which include prior informed consent, mutually agreed terms, agreed equitable benefit sharing, compliance and enforcement, monitoring and evaluation (Gregory, 2002).

However, issues of access and benefit sharing (ABS), especially with respect to genetic resources associated knowledge and derived products have been of global concern. Some of the property right ownership, technology transfer, implementation, compliance and enforcement. In order to have proper linkage between resource provider effective framework defining ownership, benefit sharing mechanisms and resource management (Gwaze, 2001).

For instance, frameworks are needed to draw the line between academic and commercial bioprospecting. As it is now, there is a very thin line between the two. The concern is that this could be an entry point of biopropestors. Universities and Research Institutions act as entry point for bioprospectors and access point to various resource owners. They are in a unique position to negotiate agreements that will benefit communities, conservation areas and drive the industry. Therefore, there is the need to understand the nature of the collaborative arrangements, agreements and MOUs among Universities, Research Institutions, Research Managers, Communities and their collaborators. These arrangements should address the following: technology transfer; royalties and equitable distribution of benefits and define whether they are short, intermediate or long term; ownership of samples and derivatives and intellectual property right; limit on third party transfer; reporting and tracking requirements; contribution to conservation of the species and ecosystems and Material Transfer Agreement (MTAs). MTAs should clearly define the purpose of bioprospecting whether it is for scientific, educational and non-commercial purposes only or purely commercial. It should also define any restrictions or any other use of specimens or research results, including but not limited to commercial development (Shiva, 2000).

CHALLENGES FACING BIOPROSPECTING

Africa's biodiversity is in high demand by a wide range of bioprospectors both locally and internationally. However, the potentials for bioprospecting is not being realized in most country because key stakeholders have not worked out a common vision and strategy (Gwaze, 2001). For example, those related to access and benefit sharing - are based on international conventions such as the convention on Biological Diversity and have not fully domesticated to fit the national agenda. This has led to a number of conflicts in the bioprospecting subsector in Africa. Participants of an international workshop on sustainable utilization of biodiversity organized by Kenya's Ministry of Forestry and Wildlife in partnership with other stake holders in March 2009 concluded among others that indeed that there are gabs in existing legislations which partly hinder bioprospecting development in the country (Gregory, 2002). In order to exploit the country's mega-biodiversity Kenya biotech industries, research managers, government and academia need to generate a common vision on bioprospecting and position the country as a place of choice on bioprospecting related research and development.

The research identified the following as some of the key challenges to bioprospecting in Africa:

i) Limited funding for bioprospecting from government/private sectors. Most of the funds are from donors making bioprospecting donor-oriented.
ii) Disjointed and lack of national research and innovation systems.
iii) Handling and auditing bio-materials under MTAs specifically for students under split programs.
iv) Low level of awareness on intellectual property and related legislations. Many researchers undertake bioprospecting work on the basis of MOUs which are insufficient for protecting biological resources.

v) Most bioprospecting work is not declared to the university by researchers for fear of losing ownership.
vi) Lack of biodiversity act and bioprospecting policy and strategy that could articulate issues of bioprospecting in the country (Africa).

The research also noted the following threats to bioprospecting in Africa, loss of biodiversity due to population pressure; climate change; loss of IK; biopiracy; migratory species and bio-battle and; inadequate protection for local innovations.

II. CONCLUSION AND RECOMMENDATION

Formulating a good Access and Benefit Sharing (ABS) policy remains one of the major challenges to African Countries realizing these benefits. With a good ABS policy, bioprospecting has many benefits that include scientific, environmental, educational, economic and Institutional. Taking advantage of opportunities provided by these benefits requires building both individual and institutional capacity. Enhanced market and scientific research can clarify issues and raise the awareness of key stakeholders. Institutionally, measures to build capacity should include ensuring that appropriate legislative and/or regulatory measures are in place to support ABS agreements, integrating ABS into biodiversity strategies and developing and sharing model commercial ABS agreement (Shiva, 2000).

Indeed, a good ABS can bring along both monetary and non-monetary benefits as defined by the Bonn Guidelines. Monetary benefits may include advance payments and royalties. Advance payments are used primarily to set up trust funds for the disbursement of small community grants for development projects such as medicinal plant cultivation and marketing, tool purchases, written educational materials, shaman apprenticeship programs, and travel and workshops to build alliances among local community leaders. Royalty is a percentage of income from product commercialization as stipulated in research and benefit-sharing agreements. No specific percentage of benefit sharing has been fixed and varies from partnership and level of negotiations. Example of non-monetary benefits include capacity building through training, equipment transfers, development of infrastructure to conduct biomedical research, manage natural resources, region-specific disease research that give priority to local interests, long term collaboration between various conservation, health, biotechnology and educational organizations and workers of both host and bioprospecting countries.

However, due to lack of negotiation skills and ignorance, most resource providers do not benefit equitably from their resources. Currently, negotiated Bioprospecting agreement are being preferred where prior informed consent is being used as a tool for negotiation. In most cases it is coming out clearly that technology transfer and capacity building is preferable over arrangements anticipating financial windfalls, which may never materialize. Therefore, long-term development of the scientific, commercial, and management capacity of source countries may be single most valuable benefit of bioprospecting research and development work.

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