Genetic resources

DEFINITION

Genetic material of actual or potential value.

Convention on Biological Diversity (CBD) 1992[1]

FURTHER DEFINITIONS

Supporting definition:

Any material of plant, animal, microbial or other origin containing functional units of heredity.

Convention on Biological Diversity (CBD), Article 2[1]

KEY POINTS

- Genetic resources are important to humans because they provide a pool of genetic diversity that has commercial value and promotes food security.
- The fair and equitable use of genetic resources is one the objectives of the Convention on Biological Diversity (CBD) and is covered by Article 15 of the Convention.
- The Nagoya Protocol aims to create greater legal certainty for users and providers of genetic resources. The Protocol is going through the process of ratification by the Parties to the CBD and therefore is not yet active.
- Genetic resources are of particular significance to sustainable and secure agricultural production.

INTRODUCTION

There are two important themes with regard to genetic resources. The first is the sharing of benefits arising from the use of genetic resources by commercial organisations. The second relates to food security. Having adequate genetic resources within a population is important to ensure adaptability in new circumstances[2]. In the context of agriculture, adequate crop genetic diversity facilitates resistance

to diseases or pests which can devastate genetically uniform crops [3]. Diversity can be particularly important as crops are generally grown in monocultures and the proximity of individual plants facilitates the spread of disease.

CONVENTIONS

Genetic resources are mentioned in one of the three headline objectives of the Convention on Biological Diversity (CBD): the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding [1]. In addition, Article 15 of the CBD covers access to genetic resources including issues of rights, origin, access and informed consent.

ACCESS AND BENEFIT SHARING

Access and benefit sharing [4] is seen as a mechanism for the transfer of revenue from private sector exploitation of genetic resources to to fund conservation and to provide a revenue stream from the developed countries, which have technological knowledge, to developing nations, which often support high biodiversity [5]. The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity is a supplementary international agreement to the CBD. The objective of the Protocol is the “fair and equitable sharing of the benefits arising from the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding, thereby contributing to the conservation of biological diversity and the sustainable use of its components” [6]. The Nagoya Protocol aims to create greater legal certainty for both the users and providers of genetic resources. It does so by establishing predictable conditions for access to these resources and ensuring that benefit-sharing occurs when the resources leave the contracting party providing them [6]. The Nagoya Protocol entered into date in October 2014, after fifty Parties to the CBD (generally governments), agreed to be bound by the treaty and put into place national legislation to give the treaty domestic effect [7].

RECENT DEVELOPMENTS

The current commercial and scientific environment has altered since 1992 [5]. While commercial and scientific utilisation of biodiversity has historically focused on wild harvest and collection of species, more recently the focus has shifted. For example, genetic material is being sourced from microbes such as bacteria and viruses, which are becoming increasingly important in the search for new products [8]. The marine environment, both as a potential source of genetic material and the habitat of large numbers of unstudied microbes, is therefore becoming increasingly important [9, 10, 11, 12]. A CBD decision, adopted in 2006, recognised the potential value of genetic resources in deep sea areas beyond the limits of national jurisdiction [13]. At the same time there has been a reduction in the emphasis on natural product research by the pharmaceutical industry [11], although a recent review on the sources of new drugs states that the authors emphatically “advocate expanding, not decreasing, the exploration of nature” as a source of novel drugs for diseases [14].

GENETIC RESOURCES IN AGRICULTURE

The use of genetic resources is an important issue for agriculture. The The Food and Agriculture organization of the United Nations (FAO) is exploring the potential of genetic resources for adaptation

to, and mitigation of, climate change with respect to food security [15]. Lack of genetic diversity and associated vulnerability to pests and diseases has caused famine as a result of crop failures. This in turn has led to the economic collapse of entire industries [3]. The existence of genetically diverse varieties maximises the chances of finding resistant strains, which helps to alleviate or avoid these catastrophic outcomes [15].

LINKS BETWEEN CBD AND FAO PROCESSES

There are strong links between the CBD processes and the FAO which has developed a Global System for the Conservation and Utilization of Plant Genetic Resources for Food and Agriculture. The FAO adopted the International Treaty on Plant Genetic Resources for Food and Agriculture which entered into force on 29 June 2004 and calls for the conservation, sustainable use and fair and equitable sharing of benefits arising from genetic resources.

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Category:

Internationally recognised definitions

Key terms: In depth

Related pages

Genetic material (Terms)

Genetic diversity (Terms)

Nagoya Protocol (Terms)

Gene pool (Terms)

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