

UNCTAD Expert Meeting on Systems and National Experiences for  
Protecting Traditional Knowledge, Innovations and Practices

Geneva  
30 October – 1 November 2000

**Genetic Resources & traditional Knowledge Use and  
Commercialization in Vietnam: The Case of the Crop  
Plants and Medicinal Plants**

Prepared by

**Le Quy An**

**President  
Vietnamese Association for Conservation  
of Nature and Environment**

**Consultant**

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# **GENETIC RESOURCES & TRADITIONAL KNOWLEDGE USE AND COMMERCIALIZATION IN VIETNAM : THE CASE OF CROP PLANTS AND MEDICINAL PLANTS**

**By Le Quy An\***  
**VIETNAM**

## **I- Overview**

With its diverse climate and ecosystems, fertile plains, forests and mountains, Vietnam is endowed with a richness of biodiversity, including some 275 species of mammals, 800 species of birds, 180 species of reptiles, 80 species of amphibians, 2,500 species of fish, 5,500 species of insects, Vietnam is home of 12,000 plant species of which 7,000 have been identified. So that, Vietnam is considered to be the 16th country of highest biodiversity which is relatively unique, as 40% of the flora may be endemic. In only two years 1992 and 1994, three mammal species new to science have been discovered and described and another mammal identified in 1997. Just recently, according to IUCN Hanoi Office 's press release, 7 new plant species are discovered in Halong Bay, the World Heritage Site. All these new plant species are endemic to Halong Bay, as they are found nowhere else in the world.

But many species are facing the danger of extinction with over 300 fauna and 350 flora listed as endangered species in Vietnam's Red Book [1] [2].

The national economy of Vietnam depends largely on natural capital, especially natural resources. Agriculture still occupies a notable part of the GDP, in comparison with other countries in the region (Table 1) :

**Table 1 : Distribution of GDP among sectors (%), 1998**

Country	Agriculture	Industry	Services
Vietnam	25.8	32.5	41.7
Thailand	14.2	37.5	48.3

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\* The Author is the President of the Vietnamese Association for Conservation of Nature & Environment

Indonesia	18.8	45.7	35.5
Philippines	16.9	31.5	51.6
Singapore	0.1	35.3	64.6

The use of biological resources plays a very important role in agriculture (including forestry and fishery) for ensuring the life of the people and the food security of the nation.

Traditional crops and new hybrides are helping to increase food production, the gross output of which has reached 33.8 Mill. tons in 1999, while domestic consumption demands are about 21 Mill. tons only.

In the health sector, more than 3000 medicine plants with thousands of prescriptions have been used by the population for centuries.

This paper will focus on plant genetic resources to review the use and commercialisation of traditional knowledge.

## **II- The case of crop plants varieties**

*The use of traditional plant varieties and the adaptation of introduced varieties are relying on scientific achievements and knowledge of the people.*

While the Kinh people, the largest nationality occupying 85% of the total population and distributed all over the country is the main actor in developing and maintaining rich agricultural diversity largely based on wet rice farming, some 54 ethnic minorities living mostly in mountainous areas are equally known as the primary creators and custodians of agricultural biodiversity. A Tay farmer in Son la province identified more than six wild yams in the forest and explained the specific way to utilize each species. He said that there are still so much more species of wild yams but got tired of describing the different characteristics of each [3].

It is the same case with medicinal plants and other natural products developed from the knowledge of indigenous and local communities. A very large number with some thousands of plant species are utilized for food, medicine, fodder, fibre and raw material [3].

Most of agricultural crops are domesticated and grown many years ago, they are very familiar to the population. A certain number of varieties are still growing in the wild.

The conservation, use, development and commercialization of plant varieties are relying on R&D activity, as well as productive practice of farmers, meanwhile traditional knowledge is commonly used and partly commercialized.

Scientific Research Institutions and Universities/ Technical Colleges used to play a leading role in cooperating with local communities for collecting crop germplasms and adapting new/introduced varieties and hybrids. (See Annex I: List of main Scientific Research Institutes related to Genetic Resources and Plant Varieties).

For ex., during the period from 1983 to 1991, the S&T Institute of Agriculture has collected 5,516 samples of crops and wild plants varieties related to 70 different species. Can tho University has achieved the three year collection effort with more than 800 accessions which made the total rice accessions up to 1,800. In the framework of the “Community PGR project”, (PGR- Plant Genetic Resources) Can tho University is also involved in the distribution of Traditional Rice Cultivars to farmer-based rice genetic resource conservation and development. 125 farmers in 4 provinces were trained in seeds conservation, selection methods and field documentation. 517 rice accessions were distributed to these farmers.

The materials which include pure line selection from populations, are initially characterized and evaluated at Can tho University. These were then distributed to the farmers for trials and observations.

The materials given to the farmers were sorted out according to the ecosystems where the seeds are to be grown. For ex. 129 accession are planted in the Can giuoc District of Long An Province. Because of the salinity problem in this district and the rainfall pattern, the farmers in the district accepted only short-term maturing traditional cultivars. On the other hand, 136 medium-term accessions were managed by selected farmers in the Tan Tru District of Long An Province. The selection is again based on the prevailing conditions of the district.

The cultivars are evaluated by farmers. They have begun to choose, usually during “Farmers Day”, the cultivars that are subjected to further trials or in a few cases, seed multiplication. Field documentation is managed by the farmers themselves. Can the University provides them with a simplified and shortened descriptive form. Further stage of the project has been expected to carry out research in various areas, among which one relating to Indigenous Knowledge Systems. This research is aimed at conserving and strengthening farmers’ experiences, traditions and knowledge in PGR conservation and development. It includes the documentations of farmers’ experiences in seed selection, storage, cultivation practices, planting material preparation, insect and disease control, biodiversity and also the analysis of the scientific basis of indigenous knowledge systems.

These examples show that there is an obvious need in establishing a partnership between S&T Institutions/Universities and farmers. On one hand, the study and development of new varieties or hybrids, the introduction and adaptation of alien varieties are mainly carried out by these institutions in close cooperation with local communities as experimentators, evaluators and potential users. Such partnership is also needed for improving and developing traditional knowledge on a better scientific analysis basis.

But on the other hand, S&T Institutions/Universities are often benefiting from indigenous wisdom in the conservation and utilization of PGR, without any obvious payment or compensation to local communities.

Some S&T institutions continue to produce and supply plant seeds, but the formal seed supply systems used to be developed and maintained by plant seed companies.

Some regulation does exist for sharing benefits among various stakeholders (see Par. II), but it works more to the advantage of plant breeders, rather than to the local communities owning traditional knowledge.

Strictly concerning indigenous/traditional knowledge, its use and commercialization is realized by two ways :

- Traditional knowledge became commonly known and used. Most of agricultural practices are popular, because indigenous and local

knowledge have been usually developed incrementally and collectively, so that it is often difficult to identify a particular person or group of persons as the inventor of a plant- based traditional cure or useful crop variety [4], although local communities in many cases are the ultimate protectors and nurturers of biodiversity.

- The multiplication and production of seeds are made by farmers, mostly for their use and partly for exchange. They have the implicit rights to save seeds of new varieties for reproduction for subsequent use or exchange between them, without payment (royalty) to plant breeders.

By the way, it is worthy to mention that in an alarming rate, these valuable knowledge is disappearing together with the loss of landraces, the destruction of habitats and the increasing use of new hybrids. Such fact also shows the disadvantage caused to both biodiversity and traditional knowledge by the shortcoming of national policy and regulation.

### **III- The case of medicinal plants and traditional knowledge on health care [9]**

#### ***A. Overview***

It is quite similar with the traditional use of medicinal plants. Most of them became common and well known. Dr. Do Tat Loi produced the famous book entitled “Medicinal Plants and Medicinal Ingredients of Vietnam” in which more than 800 plant species are described with their biological and therapeutic characteristics. The use of traditional knowledge and consultation with eastern physicians/doctor - herbalists have permitted him to introduce hundreds of prescriptions for treating many diseases.

As a popular feature, especially in rural areas, many medicinal plants are grown in family gardens and used daily by the population, for ex. *paederia tomentosa*, *Zingiber officinale*, *sophora japonica* etc ...

Other medicinal plants have been domesticated or widely grown for large scale production, for ex: *Eleutherinne Subaphylla*, *Leonureus heterophyllus*, *Andrographis paniculata* [3].

Annual harvest amount of some medicinal plants can be very high, for ex: *Angelica dahurica* (157t), *Polygonum multiflorum* (28t), *Ligusticum wallichii* (37t), *Coix lachryma-jobi* (178t)...

Many plants can be used in curing common diseases, such as fever, cough, diarrhoea, influenza.

Sometimes, the combination of traditional and modern medicines is very helpful in treating serious diseases, for ex.. *Artemisia annua* for treating malaria, *Catharanthus roseus* for treating blood cancer... Such kind of achievement is usually developed by S&T institutes and pharmaceutical enterprises, the medicinal products of which are registered under their own trade mark.

Concerning medicinal plants and traditional therapeutic methods, there are many cases in which the know-how still remains individual secret. May be, some people is holding information and knowledge about some specific plant (its locality of growth, characteristics, therapeutic effects, processing method, use for treatment...).

In most cases, as traditional medicinal prescriptions usually contain a large number of ingredients, varying according to the concrete conditions of the patient, one plant can be used in different prescriptions with various doses in combination with other plants, so that there are many prescriptions known as handed down from ancestors and “family secret” which are transmitted from generation to generation. Such kind of “no-patent-needed-informal-but-recognized “knowledge is helping its owner to get income, and the owner is not willing to share. The owner is neither willing to register or to apply for patenting because he/she is afraid that the secret might be let on to other people.

### ***B. Vietnam ‘s national polisy on health care***

President Ho chi Minh, in his letter to the national conference of medical workers on 27-2-1952 wrote : “ *Medical workers should help the people and the government of Vietnam to build a health care system for meeting people ‘s needs. Health care should be built on scientific, national and popular basis. In order to broaden the scope and the scale of health*

*care, you should pay attention to study and combine oriental and western medicines. ”*

Such a policy has been developed later under many aspects of the social life.

- The 1980 Constitution, Chapter III, Article 44 states : “ *Building and developing a Vietnamese medicine in the preventive direction and combining modern with traditional medicines .”*
- The 1992 Constitution, Chapter III, Article 39 states : “ *Building and developing Vietnamese medicine in the preventive direction, combining prevention and cure, developing and combining traditional with modern medicines, developing public and private health sectors, realizing health insurance, creating favourable opportunity for every people to access health care services .”*
- The Law on People ‘s Health care, promulgated in 1988, defines the inheritance, promotion and development of traditional medicine and its application in people ‘ health care and protection ( Chapter V, Articles 34, 35, 36, 37).
- In 1993, the President of State issued an ordinance on private health care practice.

### ***C. Major measures***

Some major measures have been taken to implement the national medicine policy :

- Raising awareness on the value and the role of traditional medicine, on the needs to inherit and study traditional medicine and to combine traditional and modern medicines;
- Building, strengthening and developing all organisations in the traditional medicine network (specialized hospitals, the Association of Traditional Medicine ...);
- Making full use of capable traditional physicians, people’s experience, experience handed down from ancestors, from herbalists in mountainous areas; organizing courses for training and

refreshing the knowledge of health workers practicing traditional medicine;

- Setting up institutional framework for managing and promoting traditional medicine : establishment of the Department of Traditional Medicine inside the Ministry of Health; 5 institutes for carrying research and practicing traditional medicine; 42 provincial traditional medicine hospitals; 265 traditional medicine departments in modern clinics; traditional medicine department in medical universities. There are currently 22 professors and assistants professors, 1384 physicians and 1678 assistant physicians in traditional medicine.

#### *D. Some results*

- The Ministry of Health has licenced 1,047 traditional medicines produced by both public and private sectors to be circulated on the market.
- Pharmaceutical companies are providing hospitals with pharmaceutical herbs (about 20,000 tons per year), for the production of traditional medicines (500-1,000 tons per year).
- Besides state-owned enterprises, there are about 1,000 private traditional medicines enterprises and pharmacies.
- In 1999, about 8,000 private and collective traditional medicine facilities provided diagnose and treatment, and produced traditional medicines.

Every year, about 30% of patients received diagnose and treatment by traditional medicine.

#### **IV. There still are very few legislative documents on management and use of genetic resources and almost any one on the protection of traditional knowledge.**

However, we could refer to the Government Decree No 7-CP dated 5-2-1996 on seed varieties, raising productivity and quality and speeding the multiplication of seed varieties:

A/ The overall policy of the Government is to invest for building up the national capacity in conserving, selecting, producing and carrying on business of seed varieties. (Art.4) ;

B/ Plant genetic resources are considered as national property and managed by the State. All organizations and individuals are encouraged to prospect, collect, preserve, utilize and enrich genetic resources for the benefit of the national economy and social welfare (Art. 8). The Ministry of Agriculture and Rural Development (MARD) is the main governmental body responsible for the State management of seed varieties ;

C/ The State encourages and protects the legal rights of all Vietnamese and Foreign organizations and individuals in their scientific research and business activities (Art.3) and facilitates international cooperation (Art.13) on seeds and breeder plants. Nevertheless, such activities should be licensed and put under the control of MARD (Art.14) and follow strictly technical process (Art.11) ;

D/ It is stated that newly produced, selected or imported seed varieties are subject to tests or pilot production before recognition and larger use (Art. 9). Seed varieties as goods in the market should be sold under trade mark with certificate of quality. All illegal and unfair behaviours in production and trade of seed varieties are forbidden (Art.13) ;

E/ Plan breeder owns the copyright on new seed varieties (Art.10).

The Decree No.7- CP provides a legal framework for seed varieties management, but at the same time shows a shortcoming in protecting traditional knowledge and ensuring equitable sharing of benefits derived from its use.

**V. Vietnam has ratified the Convention on Biodiversity (CBD) and prepares to join WTO. It implies the application of CBD and The Trade-Related Aspects of Intellectual Property Rights (TRIPs).**

There is a need to understand the contents of CBD and TRIPs, and to seek the way for elaborating national legislative framework in this domain.

A/ The three objectives of the CBD are the conservation of biological diversity, the sustainable use of biological resources, and the fair and equitable sharing of the benefits arising from the use of genetic resources (Art.1). The Convention obliges members to take various steps to conserve biodiversity within their jurisdictions, emphasizing in situ conservation and the role of traditional lifestyles and local communities (Art.8):

*“Subject to its national legislation, Each Contracting Party shall respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices”*

While the CBD establishes the principle of fair and equitable sharing of benefits derived from the use of genetic resources, specific measures to facilitate benefit sharing are expected to be formulate at the national level, as stated in Art.15: *“Each Contracting Partly shall take legislative, administrative or policy measures with the aim of sharing in a fair and equitable way the results of research and development and the benefit arising from the commercial and other utilization of genetic resources”*.

B/ The TRIPs Agreement extends the international trade regime to intellectual property rights (IPRs) and obliges WTO members to provide at least a specified level of protection to all the generally recognized forms of IPRs.

The TRIPs’ provisions seek to globalize the dominant patent paradigm of developed countries at the expense of developing countries, because these provisions guarantee ownership rights to products made in the laboratories of developed countries from the knowledge of indigenous peoples and local communities. So that, only the industrial model of innovations is recognized. Meanwhile the cumulative collective system of innovation of traditional communities is excluded by definition in TRIPs provisions [4].

C/ In 1978, the International Convention for the Protection of New Varieties of Plants (UPOV Convention) covered only commercially marketing or selling the protected variety’s propagating material. Farmer thus had the

“privilege” to use seeds derived from a first crop to plant a second crop without paying the plant breeders’ rights (PBRs) owner a second royalty fee. But the amended 1991 UPOV Convention theoretically extinguishes the farmers’ privilege by extending the PBR to all uses, although *it does allow member States to limit PBRs in their national legislation*. The amended Convention also forbids the use of a protected variety to create a new variety if the newly created varieties contain virtually all of the original variety’s genes [7].

D/ The workshop on Traditional Knowledge and Biological Diversity held in Madrid, November 1997 highlighted the need to clarify the relationship between the WTO TRIPs Agreement and environmental conventions dealing with compensation to, or benefit-sharing with local communities involved in biodiversity conservation [6].

E/ Being aware of the conflicts between the CBD and the TRIPs Agreement, specialists from many countries, especially from developing countries, have been carrying out studies for bridging the gaps between CBD and TRIPs [5]. The likely feasible for countries may be to incorporate in national patent laws all the exclusions allowed by TRIPs (Table 2).

**Table 2: Patenting in TRIPs: compulsory and optional exclusion.**

<b>Compulsory exclusion</b>	<b>Optional exclusion</b>
<ul style="list-style-type: none"> <li>- Inventions that are not new, do not involve an inventive step, or are incapable of industrial application.</li> <li>- Failure to disclose the invention in a manner clear and complete enough to be carried out by a person skilled in the art.</li> </ul>	<ul style="list-style-type: none"> <li>- Diagnostic, therapeutic and surgical methods for the treatment of humans or animals.</li> <li>- Inventions, the prevention of the commercial exploitation of which is necessary to protect <i>ordre public</i> or <i>morality</i>.</li> <li>- Animals and plants (including plant varieties).</li> <li>- Essentially biological processes for the production of plants or animals.</li> <li>- Failure to provide information concerning corresponding foreign applications and grants</li> </ul>

(Source: Graham Dutfield) [5]

There are also other proposals in defence of biodiversity and indigenous knowledge [5].

Gurdial Singh Nuar has formulated a new definition of “innovations” which includes “... derivatives which utilize the knowledge of indigenous peoples and local communities in the commercialization of any product as well as to a more sophisticated process for extracting, isolating, or synthesizing the active chemical in the biological extracts or composition used by the indigenous peoples”.

The community should be declared the “owner” of knowledge. It should exercise complete control over the knowledge collectively and hold it in trust for themselves as well as future generations. The community therefore holds this right as custodians or stewards and it is thus held in perpetuity. No use should be made of the knowledge save with the consent of the community which is the custodian of this knowledge. Any use of that knowledge should be payable by the user.

In Vietnam, MARD is drafting legislation on the protection of new plant varieties. Since the draft regulation is not examined and approved yet, there is not any formal interpretation of its contents.

However, through workshops and discussions during the process of its elaboration, it might be probably a tendency to reconcile the conflict between CBD and TRIPs, for ex. by recognizing the rights of the patent holder and at the same time, denying patent in different cases, such as: a) personal and non-commercial use of seed varieties; b) using the product of the harvest obtained by planting the protected variety, for propagating purposes on one's own holdings and c) using the protected material to develop new varieties and for scientific purposes...

But it would be necessary to mention that genetic resources are diverse according to their uses, and traditional knowledge are often associated with particular genetic resources.

While there are conflicts between the CBD and the TRIPs Agreement, existing international legal instruments also provide an possible basis with fundamental principles upon which national regulatory framework can be premised. For example, Agenda 21 and the Forest Principles with few references to local control over genetic resources associated with traditional knowledge could be complemented by the 1996 International Covenant on Economic, Social and Cultural Rights, the 1996 International Covenant on Civil and Political Rights and the 1948 Universal Declaration on Human Rights [8].

We have also the possibility to learn from foreign experiences.

- In the Philippines, the President Executive Order (PEO) was issued in 1995 for regulating biodiversity prospecting which is defined as “the research, collection and civilization of biological and genetic resources for purposes of applying the knowledge derived therefrom to scientific and/or commercial purposes”

The PEO requires that all biodiversity prospecting should be subject to the PIC (prior informed consent) of local and indigenous communities.

- In Costa Rica, the Legislative Assembly passed the Biodiversity Law in 1998 which is seen to date as the most ambitious and elaborate national law to implement the CBD. The overall objective of the Law is to conserve

biodiversity, sustainably utilize resources and distribute fairly the derived benefits and costs. Its covers a full range of issues, among which the protection of scientific and traditional biodiversity-related knowledge through intellectual property rights and/or *sui generis* systems.

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Developing countries have to create effective *sui generis* protections for plant varieties in 2000, and 2006 for least developed countries.

Vietnam has to take advantage of the grace period allowed by TRIPs to devise appropriate IPR laws conforming to national interests.

**Annex I: List of main Scientific Research Institutes  
related to Genetic Resources and Plant Varieties**

1. Institute of Biotechnology
2. Institute of Oceanography
3. Institutes of Ecology and Biological Resources.
4. Institute of Materia Medica.
5. Food Crops Research Institute.
6. National Institute of Animal Husbandry.
7. Vietnam Agricultural Science Institute
8. Forest Science Institute of Vietnam
9. Institute of Agricultural Science of South Vietnam
10. Cuu Long Delta Rice Research Institute
11. Rubber Research Institute
12. Tea Research Institute
13. Research Institute of Marine Products
14. Maize Research Institute
15. Honey Bee Research Center
16. National Institute for Soil and Fertilizers
17. Research Institute of Vegetable and Fruit
18. Institute of Veterinary Medicine
19. Institute of Agricultural Genetics.

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