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RELEVANT STAKEHOLDERS REGARDING AN INTERNATIONALLY RECOGNIZED
CERTIFICATE OF ORIGIN/SOURCE/LEGAL PROVENANCE**

Note by the Executive Secretary

Addendum

1. The Executive is circulating herewith a paper submitted by the Government of Italy containing an analysis of the rationale of the genetic resource certificate of origin within the context of the Convention on Biological Diversity. As noted at the front of the paper, the views expressed are solely those of the author.

2. The paper is being circulated in the form and language in which it was received by the Secretariat, and the original page-numbering is retained.

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An Analysis of the Rationale of the Genetic Resource Certificate of Origin within the Context of the CBD

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A paper prepared as background information for the Group of Technical Experts on an internationally recognized certificate of origin/source/legal provenance (Convention on Biological Diversity).

The views are solely those of the author.

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This paper is aimed at stimulating reflection on some of the elements considered fundamental for the drawing up of an international certificate of origin/source/legal provenance. Some of the topics covered here would naturally merit deeper analysis, but this is beyond the scope of the present work.

Appropriate access to genetic resources, and the fair and equitable sharing of the benefits arising out of their utilization, constitute the third – as yet unrealised – objective of the Convention on Biological Diversity (Rio, 1992). In fact, however, achieving such regulated access to, and sharing of, genetic resources is a *prerequisite*, in terms of both conditions and incentives, for realising the first two objectives of the Convention – conservation of biological diversity and the sustainable use of its components.

Within the current CBD debate an “International Certificate of Origin/Source/Legal Provenance” is considered a potential ‘pillar’ of the International Regime on Access and Benefit Sharing, and this raises the following questions:

What is the rationale of the certificate of origin/source/legal provenance certificate?

What is its role in relation to the vision and objectives of the CBD?

What are its specific aims?

What is the ‘institutional importance’ (see below) should be considered in a feasibility survey?

In other words, is an international certificate of origin indispensable, or is it just useful, with regard to meeting the Convention’s goals?

Above all, how important is it to know the precise origin of genetic resources?

Given the above questions, what is the methodology that should be adopted, the logical path to be followed, for a correct analysis of the issues?

1 ‘Institutional choices’ in the CBD - methodological tools

This section suggests that Institutional Economics² when applied to environmental policy-making offer appropriate analytical tools for furthering research in this area.

The issues arising from the drawing up of an International Regime on ABS, and of an International Certificate of Origin, fall within the category: *institutional choices concerning economic/environmental policies*.

² See e.g. Alston L.J., Eggertsson T., North D.C. (eds.) “Empirical studies in institutional change”, Cambridge University Press, New York, 1996, Hodgson G.M., “A modern reader in institutional and evolutionary economics: key concepts”, Edward Elgar, Northampton, 2002, North D.C., “Institutions”, in “Journal of Economic Perspectives”, vol 5, 1, pp. 97-112, 1991, Samuels W.J., Tool M.R., Hodgson G.M., “The Elgar companion to institutional and evolutionary economics”, Edward Elgar, Aldershot, 1993, Samuels W.J. “Economics, governance, and law: essays on theory and policy”, Edward Elgar, Cheltenham, 2002, Schmid A.A., “Conflict and cooperation: institutional and behavioural economics”, Blackwell Pub., Oxford, 2004, Schmid A.A., “Rationality“, Journal File, 2002, available at <http://www.msu.edu/user/schmid/rationality.htm>

See also Demsetz H., “Towards a theory of property rights”, in “American Economic Review”, 57, 347-359, 1967, Barzel Y., “Economic analysis of property rights”, Cambridge University Press, Cambridge, 1997, Hanna S., Munasinghe M., "Properties rights and the environment. Social and ecological issues", The World Bank, Washington D.C., 1995, Harriss J., Hunter J., Lewis C. M., (edited by), "The new institutional economics and third world development", Routledge, London, 1995.

It is possible to draw up a conceptual framework covering four different levels of *institutional choices*:

1. Identification of optimum, high ranking, ‘*constitutional*’³ institutions, requiring choice of the general institutional reference frame:
 - *The market* (relying on self-regulation of the free market),
 - *Public sector/state/international institutions* (relying upon a more or less centralised regulation set up by the Government or by an International Institution/Convention)
 - *Collective action* (permitting local self-managed communities to operate autonomously),
2. Definition of rights on goods,
3. Assignment or ‘acknowledgement’ of property rights on goods. Indication of right holders ... who is the ‘owner’ of what...⁴
4. Assessment of the advisability of introducing rules that regulate relationships, or furthering public sector interventions aimed at correcting ‘distortions’ and ‘market failures’.

In order to apply the above methodological framework to the CBD, the following steps are required:

1. Identification of the objectives and preferences of the international community, which determine the optimal institutional choices. This means identifying the *social*⁵ *choices* underpinning environmental/economic policies, which are to provide the rationale for all future decisions. In our case, the choices of the international community are expressed in the Convention on Biological Diversity. Thus, in terms of its goals, the Convention represents fixed values, and guiding principles, the upper “*constitutional*” level.

³ The terminology used in this work reflects the trans-disciplinary feature of the analysed themes. The use of certain conceptual categories of economics can require the employment of terms assuming a different or more accurate meaning within a legal context. And the same happens with legal categories and terms with reference to economics. The word ‘constitutional’, in this context, does not have a properly legal meaning.

Other conceptual categories that will be used lay themselves open to double interpretations. One of these is that of ‘public goods’.

What so far specified remains as well valid with reference to terminology or ‘symbolisms’ peculiar to ecology or natural science in general, used in economic or legal contexts.

⁴ “Within the institutional tradition of economics property rights have a clear and fundamental role to play in economic growth.....Since rights are the product of institutional arrangements, it follow that institutions are part of the factor endowment or comparative advantage of a society” (Drahos, 2005).

⁵ Within social choices, the whole social project must be taken into consideration, since it includes purely economic or environmental goals, as well as social, cultural or human rights protection aims. It is not the intention of this paper to minimize such fundamental non-economic values through the use of institutional economic terms and concepts. On the contrary, in highlighting the importance of these elements, their direct implication, or the positive results they produce in the accomplishment of CBD goals, we wish to point out the effects they achieve within the economic/environmental world as well. Similar considerations are valid for biodiversity and biological/genetic resources. Their complex actually represents the natural elements of an environment (or parts of it), or territory, connected by local populations with cultural religious ancestral social meanings that go beyond purely economic connotations. The relationship with Earth, its elements and its fruits, normally belong to some cosmovisions that go beyond utilitarian aspects. They are integrated in a framework where the “Material” cohabits with the Spiritual, in the continuity of life and physical and ideal closeness between human activities and natural world.

In relation to non-industrial economies, Polanyi noted economy is merged with society, meaning that it does not exist if separated from social context that rules it; actions involving natural resources, work, products and services are an expression of social relationships (Polanyi, 1980).

Pottier remarks that in several countries of the world, religious observance allows for a equitable access to the endurable management of natural resources (Pottier, 1999).

2. Definition of rights, specifying, and/or ‘acknowledging’, the power and ‘*faculties*’ that the person or body entitled to the right may exercise with regard to the good. In our case, it is with regard to the object of the CBD - i.e. the environmental ‘good of biological diversity’ - biological/genetic resources and the associated knowledge.
3. The third step consists of finding subjects to whom we may assign⁶, and/or ‘acknowledge’, rights on goods (international law subjects are the Convention member states, ‘user’ or ‘provider’ countries but also – indirectly through the “institutional intermediation” of states – social groups, communities, national institutions).
4. Introduction of rules to regulate relationships such as scientific and commercial relationships between user and provider countries, and other stakeholders, or to correct market inefficiencies, in order to implement the provisions of the Convention and make them fully operative. Following the definition and assignment of rights, it may become obvious that the existing objectives or provisions of the Convention allow for their accomplishment only in general terms, by way of co-operation or exchange relationships. In this case, ad hoc rules will be required, and these can either be issued directly by the Convention, or by member states, following special undertakings assumed under the Convention. For example, some provisions include conditions favouring certain parties (Art.16, Art.17) in order to permit the correction of the *structural imbalances* which impede the technological advance of some developing countries. Moreover, some provisions, based on equity goals, acknowledge the need to correct the *trade and negotiating imbalances* generated by the international market (Art.15).

So, how does the international certificate of origin/source/legal provenance fit into a logical framework such as that just outlined above?

In order to proceed with this analysis it is now necessary to examine the ‘constitutional framework’ of social choices expressed by the CBD.

⁶ Considering the specific aims of this paper, it is not possible to analyze the type of relations between the international law and customary laws of indigenous people, nor to study the debate regarding mutual legitimization between different ‘institutional-legal systems’. The same concept of ‘definition and allocation of a right’ made by a ‘system’ towards legal relationships and individuals belonging to a different ‘system’ (subject to customary laws) would hardly conciliate with the acknowledgment of ‘legal pluralism’. We can therefore assume that, in such cases, the methodological pattern adopted in here must be considered as a neutral and independent technical-analytical instrument, applicable, with proper modifications and respect for the conceptions of indigenous people, to different ‘institutional systems’ that interact within the CBD context. The CBD can consequently be considered, in its ‘constitutional’ role vis-a-vis biodiversity as the meeting point of several institutional, formal, informal, traditional, customary positions.

2 The social choices of the CBD and the relevance of ascertaining the origin of components of biological diversity.

2.1 The definition of the CBD object: biological diversity as a dynamic process

The Convention on Biological Diversity, within its coherent ‘*constitutional framework*’, combines *ecological/biological, socio-economic, legal* objectives and principles.

The first point to be considered is the object of the Convention. What is the “good” that is considered worthy of protection and why? Analysis of these questions is never redundant, in spite of the rich literature produced during the 14 years the Convention has been in existence. And it becomes fundamentally important when viewing the Convention from an institutional perspective.⁷ In fact, this analysis determines every subsequent interpretation of the Convention's aims and principles, of rights to be defined, of subjects to grant with entitlement, and of management and negotiating rules that need to be issued.

The object of the Convention - biological diversity - draws its meaning from the *natural dynamics* which make possible “the variability among living organisms...and the ecological complexes of which they are part”, including “diversity within species, between species and of ecosystems” (Art.2, paragraph 2). This *natural dynamics* is in itself the phenomenon deemed worthy of protection. At the heart of the Convention, therefore, is the desire to protect this *dynamic process* generated by a diversity of environments and ecosystems. Or rather, to protect an interacting complex of *multiple dynamic processes*, each of which expresses its specific function only within its own environment, where it produces and reproduces biological diversity.

There is, in other words, an ‘indissoluble’ bond – an irreplaceable ecological-biological value – that ties every *dynamic process* to the environmental characteristics of a *specific locality*.

Throughout, the Convention makes constant reference to the value of local dynamics.

The main provisions, those defining the object of the Convention, specify the characteristics and the rationale of protection procedures. Paragraph 10 of the Preamble states that “the fundamental requirement for the conservation of biological diversity is the *in-situ conservation* of ecosystems and natural habitats...”⁸ Art. 2. paragraph 13 describes *in-situ conservation* as extending and reinforcing the close relationship that links the ecological-biological dynamics to a specific reference locality: “...the conservation of ecosystems and their natural habitat...and of species *in their natural surroundings*”. It also includes, within the object of the Convention, not only natural processes, but *natural anthropic dynamic processes*, as well. It emphasises the ‘indissoluble’ bond that ties natural/cultural co-evolving dynamics to the local context to which they belong: “...in the

⁷ Shaw noted: “.....there are three basic approaches to treaty interpretation. The first centres on the actual text of the agreement and emphasises the analysis of the words used. The second looks to the intention of the parties adopting the agreement as the solution to ambiguous provisions and can be termed the subjective approach in contradistinction to the objective approach of the previous school. The third approach adopts a wider perspective than the other two and emphasises the object and purpose of the treaty as the most important backcloth against which the meaning of any particular treaty provision should be measured.....Nevertheless, any true interpretation of a treaty in international law will have to take into account all aspects of the agreement, from the words employed to the intention of the parties and the aims of the particular document..... Article 31 to 33 of the Vienna Convention comprise in some measure aspects of all three doctrines.....Article 31 declares that a treaty shall be interpreted ‘in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose’ (Shaw, 2003)

⁸ The italics in this and in the following quotations were added by the author to the original text of the Convention.

case of domesticated or cultivated species, *in the surroundings* where they have developed their distinctive properties”.

The interaction between the *complex dynamics* of the ecosystem (“...a dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a *functional unit*”, Art. 2 paragraph 7) and the cultural-social-economic dynamics of human systems (“Domesticated and cultivated species means species in which the evolutionary process has been influenced by *humans to meet their needs*”, Art. 2, paragraph 6) leads to even more complex and rich *dynamic processes producing biodiversity*. This is because such dynamic processes are not only the expression of a unique ecosystem (a complex of natural interactions), but also of a *territory, with its unrepeatable “extraordinary life experience”* (a complex of socio-cultural interactions). This increased complexity and uniqueness derives from what we refer to here as a ‘diversity variables matrix’, which is more complex than either biological diversity, or cultural diversity, on their own (i.e. if analysed separately).⁹ The result, and the true object of the Convention, is a *bio cultural functional unit with a precise territorial origin*.¹⁰

The interdependence between local natural and human systems is equally strong in the case of agro-biodiversity and wild biodiversity. The biodiversity dynamic process always involves, directly or indirectly, “*social, economic, scientific, educational, cultural, recreational, and aesthetic values*”, over and beyond “ecological and genetic values” and interactions (paragraph 1 of the Preface).¹¹

⁹ Darrel asserts that the rate of biodiversity loss is directly related to the loss of linguistic and cultural diversity (bio cultural diversity) (UNEP, 1999).

¹⁰ Actions that modify the institutional structure of agricultural systems often neglect the assessment of microeconomic levels; one of these effects is the loss of biodiversity for Mexican maize (Dyer et al., 1996).

Within rural communities, the high genetic diversity of maize can be traced back to a family cultivation unit level. Many families own plots of land that are distributed over different climatic and land typologies; a distribution that neither favours nor damages some families compared to others, and grants equity among the community members. This fragmentation and environmental diversity ‘forces’ families to cultivate different varieties of maize, each suitable for a specific type of land. Dyer and Belausteguigoitia observed that the typical institutional organization in “ejido” favoured an un-divided succession of family heritage, and prevented land sale or rental, producing a fragmentation of estates in small blocks located in different workplaces.

The ‘ejido’ reformation did not take these features into account. Aiming at making the land market more flexible, it encouraged a different definition of property rights and land renting, profits deriving from economies of scale, and a harmonization of cultivation varieties. But, at the same time, it had a negative impact on agro-biodiversity conservation, which was until then committed through an integrated institutional family-community structure and it was harmonized with the environmental system and its microecosystemic diversity (Dyer et al., 1996).

In rural areas there is frequently a ‘personal relationship’ transmitted from generation to generation, with a specific ecological niche, particular weather, soil acidity, morphology and terracing, absent at lower altitudes, although very close by. In many cases plant varieties are selected with the use of the land, influenced by the institutional structure (formal or informal) that defines and allocates rights and states’ rules for their transfer. In so doing, it creates the conditions for the use of marginal environments where there is still interest and convenience (gain) in cultivating local plant varieties that would otherwise disappear. A reservoir of genetic variability is kept alive in order to obtain a gene flow and reshuffle with other varieties. These, even if commercially widespread, don’t have such a wide genome and consequently they are not able to offer all solutions for adaptation to future changes of environmental factors.

¹¹ Yusuf noted: “It is not clear how governments will fulfil this obligation without pointing a finger at their own economic, social and fiscal policies” (Yusuf, 1995).

Tarasofsky noted: “The Convention adopts a holistic ecosystem approach to the conservation and sustainable use of biological diversity. This is evidenced for example in the requirement to integrate biological diversity into sectoral and cross-sectoral plans and programmes, and into decision-making” (Tarasofsky, 1999).

2.2 The 'heart' of the Convention: *in situ* conservation

Art.8 is the central norm of the Convention. It defines the conditions of protection, and the features of the *dynamic process* that must be preserved with particular care. It acknowledges and 'sanctions' the existence of an 'indissoluble' connection between the biological diversity dynamic process, the relative environment, the local socio-cultural structure and the *in situ* conservation. It constrains and subordinates any further provisions of the Convention to the *in-situ* conservation.

Art.8j emphasizes in particular the importance of cultural diversity together with biological diversity. It acknowledges the validity and 'effectiveness' of '*local sciences*' ('*informal*') – "knowledge, innovations and practices of *indigenous and local communities*" – within the conservation–management–utilization of biodiversity. In other words, it emphasizes the role of innumerable local systems as irreplaceable '*natural high technology laboratories*', which are the point of origin of any and all biodiversity components. An ecological niche cannot be 'moved to a research centre'.

In the areas of biology and biotechnology, research and development experience a constant forced reciprocity: with field research, with the organisms that contain genetic material, with their natural environment, with the selective pressure-*experimentation-knowledge* accumulated over time by the local population. A dynamic *human evolution-mutation-selection-adaptability-natural/human innovation*, making up the research and development 'engine' that cannot be replicated in the laboratory.

These natural/human dynamics guarantee the conservation of biodiversity components (among them the genetic resources) *and of the innovation process*,¹² and lead to a co-evolution of human and natural systems that is strictly tied to the socio-cultural-economic structure of the locality.

At a local level, this unique process takes the form of '*open science with collective sources*', strongly linked to livelihood needs and integrated into local life cycles of ecosystems.

We therefore understand the reason why Art. 8, apart from stating respect for these lifestyles/knowledge/innovation systems, '*promotes their wider application*'. It acknowledges their scientific value, and defines/assigns a *decisional and economic independence* as a condition for their conservation ("...*promote their wider application with the approval and involvement of the holders* of such knowledge... and encourage *equitable sharing of the benefits* arising from the utilization of such knowledge...").

Art.8 tackles the issue of *conservation purposes*, and provides the principles/procedures to be followed in order to achieve it. It states the strong connection between the *local daily production of knowledge/science* concerning biodiversity dynamics to the potential for optimizing their management and utilization, and therefore their conservation.¹³

¹² "Swanson and Goschl noted: "Each level of the industry must invest in certain forms of R&D activities in order to generate and appropriate the information flowing from the previous level; this consists of land use investments at the base of the industry and investments in scientists and laboratories at the market-end of the industry. In this schematic there is no production at the end of this pipeline without flows occurring throughout its entire length.....The maintenance of a relatively greater diversity of genetic resources and the dedication of greater amounts of lands to the retention of that diversity are the investment choices which determine the amount of the information flowing out of this stage of the industry on the nature of the plants that work effectively in the prevailing environments (Swanson, Goschl 2000).

¹³ Barzel observed: "In order that the rights to an asset be complete or perfectly delineated, both its owner and other individuals potentially interested in the asset must possess full knowledge of all its value attributes. With full knowledge, the transfer of rights to an asset can be readily effected. Conversely when rights are perfectly delineated, product information must be costless to obtain and the (relevant) costs of transacting must than be zero.relative to their value, some of the attributes of the assets are costly to measure. Therefore the attributes of such assets are not fully known to prospective owners and are often not known to the current owner either. The transfer of assets entails costs resulting from both parties' attempts to determine what the valued attributes of these assets are and

The CBD framework leads to the drawing up of environmental economic policies directly not only towards ‘conservation in situ’, but also towards ‘science in situ’.¹⁴

We cannot hope to preserve what we do not know, and we cannot presume to know without having a constant local ‘presence’ which permits observation, monitoring, utilization and experimentation to be carried out. Such ‘presence’ enables a human community to live in a way which is totally integrated into continuously evolving biodiversity mechanisms. The *real* ‘physical, and material living’ conservation takes place at a micro level.¹⁵ Every local reality is one of innumerable micro diversities. What matters is always the change in, or adaptation of, management and utilization behaviour on the part of individuals and communities living in direct contact with unique local environmental conditions, where the complex human/environmental interactions find their particular balance. Two micro-ecosystems which are similar, but are inhabited by different human communities, will tend to develop different needs regarding their conservation, management and utilization. Human activities put pressure on environment and resources arising from their particular cultural-social-economic structure. And, even if this structure is connected to ecosystemic characteristics, it is strongly rooted in one specific territory and not in others.

In other words, there is a logical thread running through the following elements: use - knowledge - science - comprehension of phenomena and values - best opportunities for conservation - interest in conservation - sustainable utilization. Together these elements make up the life cycle of human behaviour, and this behaviour is justified by its being integrated into the dynamics of the life cycle of biodiversity and its components.

In fact, we can find many life cycles following the same logical thread, each of them having a separate local interpretation and specific adaptations. The solutions adopted vary according to the circumstances, while some common elements can be found in the ‘constitutional institutional system’ inspiring local communities, which are fundamentally based on participation and collective action.¹⁶

from the attempt by each to capture those attributes that, because of the prohibitive costs, remain poorly delineated. Exchanges that otherwise would be attractive may be forsaken because of such exchange costs.....Similar considerations apply to the protection of assets” (Barzel, 1997).

¹⁴ A unified policy for science and conservation should aim to:

- recognize the value of, add value of, and promote local integrated systems of biodiversity and knowledge,
- exploit the comparative advantages accruing to richness of biodiversity, of endemism, of ecosystems and of human integrated systems,
- acquire the scientific capabilities needed to bridge the gap penalizing rural societies,
- oppose the distorting power of the international markets, by means deriving from the conservation of, and utilization of, local resources, both natural and social (these may include externalities, incentives and use values accruing to some biodiversity ‘products’, in addition to monetary profits accruing to others) (Bozzi, 2005).

¹⁵ Even when natural events (such as climate change), or environmental policies (such as the Kyoto agreement), appear to call for action at the macro level only, their effects are also felt, and have to be combated, at the micro scale.

¹⁶ Elinor Ostrom points to the failure of attempts to introduce property rights from outside, when indigenous rights and original organization are not taken into proper consideration. Many local institutions evolved as a result of attempts by the involved populations to find better models for the organization of common activities.

The methods adopted by indigenous populations in order to undertake common actions sometimes survived wars, pestilence and natural disasters for centuries. They represent informal institutions often unknown outside the sphere of the local participants (Ostrom, 2004).

Schmid noted: “Some theories built on substantive supra-rationality de-emphasize the role of institutions. Much of the theory of ‘rational expectations’ suggests the futility of public policy as individuals see through the frame and intent of policy and thereby offset it. Cognitive theories however emphasize the role of collective learning. Beginning with language and symbols we alter the consequences of inescapable uncertainties of nature and competition with shared institutions. Rational expectation theorists find that the stability of the economy is rooted in immutable individual preferences and decision rules of maximization. Others find it in collective action, institutions and habits, some conscious and some unconscious. These latter constitute a macro-institutional foundation to individual choice and microeconomics” (Schmid, 2002).



2.3 The importance of ascertaining the origin of components of biological diversity, in terms of the CBD objectives

As a matter of fact, the true meaning of Art.8j goes beyond the acknowledgement of indigenous and local community values. The fundamental rationale of this provision, if linked to the “*constitutional*” principles inspiring the entire Convention, assumes much greater importance. Policies are focused on the local human community as the protagonist and receiver of interventions and actions promoted by the Convention. The *native community* is the crucial mainstay of conservation, sustainable exploitation and sharing of benefits. It is in fact the point of origin of the biocultural diversity dynamics and of the “*native community of genetic resources*”.

Some additional information is required, for a correct interpretation of the Convention. Member States alone are considered as subjects of International Law and of the Convention: they are the only duty-bearers carrying obligations versus the international community. The interests to be protected by an international convention, as in the case of biological/cultural diversity, may relate to different subjects (single human communities), not formally recognised as international law subjects. These are considered as ‘*value holders*’ (and not ‘*right holders*’) to be protected in accordance with the Convention’s rationale, and consequently substantial receivers of the adopted measures.

In this case, the purposes of the Convention are fulfilled through the ‘institutional intermediation’ of States, representing their communities or territories.

Commitments accepted by the States do not derive merely from “sovereign rights over their own *biological resources*” (paragraph 4 of the preface and paragraph 2 Art. 2: “Biological resources include.....any other biotic components of ecosystems with actual or potential *use or value for humanity*”), which is a restrictive interpretation¹⁷ of the object of the Convention. The commitments rather derive from being the centre and *origin of biological (cultural) diversity dynamic processes*. Every single State has a role to play, as long as its territory comprises “ecosystems and natural habitats.....populations of species....” (paragraph 13) in their functional complexity, which are subject to *in-situ conservation*.

Member States play a primary role within the Convention as being the ‘home land’ of the biological diversity dynamic processes.¹⁸ This is a different and wider concept (with an environmental-economic-institutional meaning) if compared to the simple and ‘static’ legal concept of ‘sovereign right over their own resources’.

States sovereignty “....over their *own biological resources*” (paragraph 4 of the preface) is actually based on the determination of origin of *biological resources*. Without it, states cannot affirm their ‘*ownership*’ of a biological resource. The determination of origin of biological resource (including genetic resources, Art 2, paragraph 2) entails the reconstruction of its natural dynamics and the ascertainment of its *ecosystem* and territory - from where a specific resource originates.

¹⁷ “Natural resources are those components of nature that are being used or are estimated to have a use for people and communities. In this sense, what is “a resource” is culturally and technologically determined. Cultures shape demand: until they create a use for it, a resource remains latent. Similarly the development of technology can promote new uses and thus discover new resources.....Demand and scarcity – perceived or actual, present or future – are the complementary and primary incentives to regulate resource use, and they are usually present side by side with the management and use regulations that characterise a society” (Borrini-Feyerabend, Pimbert, 2004).

¹⁸ There are some provisions of the Convention that clearly evoke the concept of dynamic process. Art 4 (“Jurisdictional Scope”) states that “.....the provisions of this Convention apply, in relation to each Contracting Party.....in the case of *processes and activities* regardless of where their effects occur, carried out under its jurisdiction or control.....”.

The reconstruction of the geographical origin of a biological (genetic) resource is therefore fundamental, particularly for the purposes of the conservation and sustainable utilization of biodiversity local dynamics.¹⁹

Before protecting the purely economic interests of single countries (evoked by the ‘resource’ concept), it is necessary to ‘trace’ and identify the origin of biological/genetic resources in order to let a country bear the responsibility for the knowledge and the management of that specific biological component (and of the natural path/process to which it belongs).

Every single biological component, in accordance with its *particular natural scale* of belonging, has its own specific function which is inseparable from the ecosystemic dynamics. This component forms part of the biodiversity reproduction/production system, just like any other element. Each one is more or less directly involved in one or more biological processes, which interact with the complexity of all other biotic and abiotic phenomena of a given environment. “The variability among living organisms....and the ecological complexes of which they are part” and the “diversity within species, between species and of ecosystems” derive from the ‘contribution’ that each component/genetic resource brings to the one evolution, operating within the ‘*natural laboratory of origin*’ of a specific territory.

The in-situ conservation of biodiversity dynamics can therefore be accomplished only if all components, and related interactions (‘the natural laboratory’), are known and ‘recognized’ as belonging to the original ecosystem (‘functional unit’) of a precise region, where a State, and no one else, is responsible for its management. Exploitation opportunities, interest in sustainability, benefits and the virtuous circle of a correct economic-environmental policy, respecting the Convention, depend on a state’s ownership and responsibility in the management of resources.

3 The ‘constitutional institutional choices’ in the CBD. Biological diversity as a public good. The role of the state, of international institutions and of the market.

There is a fundamental condition for the realization of the entire process (biodiversity dynamics and the origin of its components). To understand it, it is necessary to look at the application of economic-institutional-legal conceptual categories.

It is necessary to *recognize* ‘the ascertainment of the origin’ of the resource from a *scientific-institutional* view-point.

State entitlement must be identified through the contents of recognized rights. It is therefore necessary to adopt a procedure and an institutional method which takes into account *social choices in the area of environmental policies*, as expressed by the Convention, *transforming them into operational instruments* to influence states behaviour. Once the *social choices* and aims of the Convention are identified, as well as the institutional ‘constitutional’ guidelines (1st stage), it will be necessary to move to the second and third stage characterised by the definition and assignment of rights.

¹⁹ “In the current contractual system, genetic resources acquire value only if a marketable product is developed. This final stage concentrates consequently the great part of the conflicts arising between the different right holders whereas very few marketable products are actually developed.....this lead to a sub-optimal investment on biodiversity as a source of innovation by ignoring the other levels of value creation, particularly at the level of the ecosystem and its users” (Mathias, de Novion 2006).

Without such institutional phases it would not be possible to put principles and objectives into real operating policies and to allow a correct functioning of the public sector and the market, and therefore the Convention could not be effective.

What are the institutional policies adopted by the Convention at a constitutional level?

Or else, given the *social choices* adopted, what is the relative institutional system?

- The market?
- The public sector/state/international institutions?
- Collective action?

This analysis is fundamental with regard to rights definition and assignment and drawing up of regulations. It is also crucial to the understanding of the institutional function that should be granted by an *internationally recognized certificate of origin*.

The question we should ask ourselves, at this stage, is: *what institutions, regulations, rules, procedures of interaction among individuals or social groups*, are outlined by the CBD in order to best fulfil the *social choices*, principles, and objectives expressed with regard to biological diversity?

At a *constitutional* level, of ‘*macro-interaction*’, there are three different forms of social interaction: the market, the public sector, and collective action. Each one of these “*higher institutions*”, or “*social patterns*”, has its own particular set of institutions, rules of behaviour, regulations, and interaction procedures.

Which of these is outlined by CBD according to its object?

In order to answer this question, it is necessary to analyse the type of mechanisms and socio-economic interactions relative to the “*biological diversity good*”. And it is necessary to investigate, first of all, the nature of this “good” and its main features.

We have seen how an initial response can be given according to the participation of human communities in general (and indigenous and local communities in particular) to the biological-cultural diversity processes, and how the “*institutional choice*” adopted by the Convention in this context, has a deep impact on ‘*collective action*’.

On a different scale, we have to approach the theme of relations and social interaction generated by the interrelation between communities, national states and the international community. We will thus analyse the institutional mechanisms of the market and of the public sector (state or international institution). How do they influence the biological diversity process?

From an economic view-point, the ‘*biological diversity good*’ has the same features of a ‘*public good*’, and it assumes this form within the Convention. In particular, if we consider the dynamic process of biological diversity in its functional unit, including genetic resources, the public good features extend to all biological components as an integral part of such a dynamic.

From a legal view-point, the Convention reaffirms that “States have sovereign rights over their *own biological resources*” (paragraph 4 of the preface) and that they have “the sovereign right to *exploit their own resources pursuant to their own environmental policies*” (At. 3).

The Convention indicates Member States’ social choices on environmental-economic policies, defining the biological diversity - which is the object of the Convention - and dictating the principles that regulate it. It refers to a good - ‘the dynamic process of biodiversity’, which ‘by its nature’ has the features of a ‘public good’.

As stated above, the Convention, within its coherent “*constitutional framework*”, combines the objectives and principles of an *ecological/biological and socio-economic* nature. The social choices adopted by Member-States substantially recall the analytical-explanatory tools created by the relative scientific disciplines (ecology and biology, together with other related natural sciences, and economics together with the other social sciences).

The normative apparatus, formed accordingly, describes and regulates the natural and economic world of ‘biological diversity’, in its dimensions assumed within *real life*, within the everyday life of *any human community* in contact with a biological diversity phenomenon, *apart from artificial references to political administrative state borders*. Biological diversity, at a micro and macro ecosystem level, has no national borders. It has its own ‘*range*’ of action where *natural entities and mechanisms* merge with *socio-economic activities*. The Convention, while gathering the social choices of member states, identifies the essential points of these processes, the functioning modes, and the mass of socio-economic behaviour, which become integrated with the biological diversity mechanisms, in order to safeguard its conservation and sustainability in the exploitation of its elements. The CBD, while defining ‘biological diversity’ in a socio-economic sense, identifies therein, as well as in the series of its activities and behaviour, the distinctive features of a ‘public good’²⁰ On this basis, it dictates principles and establishes objectives. It adopts the ‘*institutional choice*’ of *constitutional rank*. And it acknowledges, as a necessary corollary to the ‘biological diversity’ nature of ‘public good’, the need to appeal to the public sector (the state at the national level, or an ad hoc institution, or, precisely, the Convention at international level) for the correct and efficient management of resources.

In other words, it recognizes the impossibility of relying on the market as a self-regulatory force. In the presence of public goods, markets are *incomplete*; they cannot operate efficiently and generate a case of ‘*market failure*’.

Biodiversity, as stated above, is a dynamic process generating variability. The biodiversity dynamic system can be considered as a coherent set of natural (cultural) processes, represented *in a broad spectrum* within a territory, reproducing/producing biological diversity. That is to say, it can be considered as a ‘*natural widespread laboratory*’, where various forms of life and innumerable biological/genetic elements are produced. Each one carries its own specific features, different from those possessed by other living beings. Each one of these ‘features’ (properties) produces a use that can have a value in itself, as such a ‘*use value*’ in the true sense, like an ‘*ecosystem service*’. It can also assume a market value and price since that specific feature, producing a particular use, is expressed in such forms as to become appropriable and subject to trade relationships (see, for example, the case of seeds of a land race, with resistance – absent in other commercial varieties of the same species – to a given pathology, or a medicinal plant producing an active principle).

The appropriation of this *natural innovation* (resistance to a pathology) - that is nothing but the a product of the ‘*biodiversity widespread laboratory*’ - takes place freely, in relation due to the impossibility of placing the ‘natural production of biodiversity’ under control, within limited and easy-to-check space and time circles, in order to *prevent* users from consumption of that natural production.

Consequently, it is not possible to request a remunerative price to cover the cost of biodiversity conservation. Nor is it possible to ask for other kinds of ‘considerations’, such as non monetary benefits or supplies of services.

Furthermore, it is nearly impossible to succeed in limiting the free spread of local knowledge and science connected with biodiversity, which has developed from generation to generation through the symbiosis between human communities and natural systems.

²⁰ In this particular context, it is not necessary to undertake a more accurate classification of the ‘biological diversity good’, making further distinctions between *pure* public goods, *impure* public goods, or *common pool resources*.

There is consequently a wider and more complex appropriation, including the production of biological-cultural diversity as a whole.

In other words, the ‘biological diversity good’, of its nature, ‘is not excludable’. It is not possible to ‘exclude’ it from ‘*biodiversity wide laboratory*’ use, and from the use of its dynamic process products.

The biological diversity good is therefore a public good. And ‘*non-excludability*’ is, in fact, one of the economic features of public goods.

Yet, *within certain limits - which we will not consider at this point -* the ‘biological diversity good’ is also characterised by the second feature of public goods: ‘*lack of-rivalry*’.

Usually, there is rivalry regarding *the use* of goods exchanged on the market: the use of a good by an individual reduces its availability for other individuals.

In the case of a ‘biological diversity good’, on the contrary, the use of a biological function (in our previous example, the resistance to a plant pathology) - through the appropriation by an individual of a limited quantity of seeds, intended for breeding activities, does not compromise the availability of that same biological function for other operators. The latter will be able to take further, although limited, quantities of the same seed variety, without producing any tangible negative effect on the ecology or on the population of that particular variety. In the case of gene pools, which can be appropriated through extremely limited quantities of genetic materials, such mechanisms are even clearer. Here, pharmacology, with laboratory synthesis of natural molecules, reaches the highest level of this trend.

Yet, although availability of such goods for others ‘is not reduced’, the individual who takes possession of a gene pool, a phenotypic property, or the chemical composition of a natural molecule, *benefits from an “added value” created by a free and natural productive process (the biodiversity dynamic), taking place in a certain territory.* He takes advantage of it, bringing it onto the market. In case of need, its value and price increases through the exclusive monopoly of intellectual property rights, associated or otherwise with further transformation and innovation processes.

Overall, everything is based on the appropriation of a *natural productive process*, a ‘*program*’, which, once it is put into the production process of the economic system, represents a particular and rare category of capital *good: the natural ‘program’ becomes an innovatory capital production process.* In other words it becomes a ‘*process innovation*’ with very high value added.

Biological diversity, therefore, is a typical example of a ‘public good’ that is freely available for whoever wishes to make use of it.

The impossibility of excluding a ‘good’ from use or consumption makes it impracticable to access the ‘market’.

It is not possible therefore to make an ‘institutional constitutional choice’, with regard to biological diversity/genetic components, counting on the self-regulatory forces of the market.

Economic theory maintains that in the face of public goods, one finds the parasitary phenomenon with ‘free rider’ behaviour. No operator would be stimulated to negotiate or pay a price for a biological diversity/genetic resource ‘good’ that is freely available, nor would there be people stimulated towards its production (conservation/sustainable utilization).

4 The operational framework of Certificate of Origin of Biological/Genetic Resources.

In the vast majority of cases (perhaps with the exception of limited natural protected areas), it is practically impossible to adopt a *policy that prevents* ‘the use of biodiversity’ or ‘the use of genetic resources’ *in situ*. And this is because one cannot easily distinguish between the different types of users.²¹ There would be discrimination between local communities, who have the need and the right to enter and use the territory, with its ecosystems and related biological/genetic resources, and ‘other users’ (those outside the local systems, or at any rate motivated by other requirements, such as commercial “*free rider*” parasitary exploitation), to whom access should be denied.

Anyone can enter a region, remove a seed or other biological/genetic element, even though of infinitesimal proportion (easily transportable and hidden), and ‘remove’ the ‘*local phenotypic scientific knowledge*’ spread throughout the region - this cannot be avoided.

Biodiversity is a ‘*wide natural laboratory*’ ‘*spread*’ over the territory, free and easy to access. Consequently, it is not possible to adopt any form of regulation restricted to an *in situ* application. Biodiversity components, artificially removed, suffer from transfers which are out of the control of responsible persons and in-situ conservation protagonists. A form of regulation not covering *the whole ecological-economic-institutional biodiversity system* would be totally ineffective.

We noticed earlier that *in situ conservation* is the ‘core’ of the Convention. And for a conservation and sustainable exploitation policy to be successful, it is vital for the local communities and authorities to acquire all possible information concerning the resources, not only for the purpose of *scientific improvement of conservation/exploitation*, but also to achieve the necessary *social objectives: knowledge becomes awareness*. And awareness of one’s own resources becomes consciousness of one’s own land value, a social – even more than economic - incentive for conservation and sustainability.

These are irreplaceable positive externalities, creating, in turn, virtuous circles within the same economic system. They produce positive economies, in particular economies of scope and network economies.

The unlawful removal of a resource becomes visible only after the event *and in times and places far from the original context*. It happens when the biological/genetic element, transferred from natural processes, “*informal by definition*”, is introduced into a formal external system, such as the science and market world. This is the moment when a *biological/genetic element becomes socially, economically and ‘physically’ evident and ‘visible’*.

²¹ “The significance of seeds and PGRs cannot be fully appreciated only in scientific or technical terms, or through a production or conservation-focused lens – for in many ways, ‘seed is everything’. Seeds are vehicles for plant genetic resources, stores of valuable genetic information and traits, and expressions of biodiversity. Plant genetic diversity, embodied in seeds, enables adaptation to changing economic and environmental conditions and supports diverse livelihoods in obvious and not-obvious ways. Seeds are important in local systems of informal exchange as well as wider social relations; at the same time, they are also increasingly prominent in global trade and commerce. Seeds often occupy a central place in cultural beliefs, practices and rituals; equally, they are routinely used as a political tool. Their contributions to livelihoods, therefore, are multi-faceted” (Seshia, Scoones 2003).

But, most of all, this is the crucial 'step' that can mark the entry of the biological/genetic resource to 'its own legal niche',²² The resource now becomes subject to rights and relationships within the framework of behaviour acknowledged by the legal systems of individual nations and by the system regulating international law.

It is not possible, therefore, to operate *in situ*, at the source, for the biodiversity system public good nature, nor is it possible to intervene at a later date, until the biological/genetic resource becomes economically/legally 'visible and depictable'. Nevertheless, it is possible to operate once the relationship has been established between the good, the resource, and the needs and rules of the economic/legal system, influencing rights and relationships that have grown up during this period and adopting an effective instrument for these purposes and for the economic-legal 'timing' of this phase.

An internationally recognized certificate of origin of the (biological) genetic resources, which is mandatory within scientific and commercial relationships, would achieve these purposes.

The ascertainment of the place of the origin of biological/genetic resources would be the instrument to bring management and control of a biological element/genetic resource back to its own ecosystem, to its native territory. And it is a fundamental condition to achieve a real conservation activity.

The states rights are not fully stated within the Convention and therefore cannot be exercised.

The identification of origin (and the related internationally acknowledged legal certificate) would be a fundamental instrument in the definition and assignment of rights on biological/genetic resources vis-a-vis sovereignty, property, access, management, exploitation, and on *biodiversity dynamic processes*. They would fall, therefore, within the limits of the fundamental second and third level 'institutional choices', emanating directly from the 'constitutional structure' of the *social choices* adopted by the Convention.

Secondly it would be a precious tool, both within the gamut of rules to be adopted for the regulation of scientific and commercial relations, and in the case of adjustment of *distortions*, inefficiencies or 'market failure' (the fourth stage of 'institutional choices').

²² The 'economic legal life cycle' of genetic resources is a fundamental issue requiring far-reaching analysis. This analysis calls for the identification of the ecological niche, the economic niche and the 'legal niche' of each individual resource.

Gibson, Ostrom and Ahn noted: "While natural scientists have long understood the importance of scale, and have operated within relatively well-defined hierarchical systems of analysis, social scientists have worked with scales of less precision and of greater variety. With the growing realization that the insights of social science are crucial to understanding the relationships between people and the natural environment, it is necessary for social scientists to identify more clearly the effects of diverse levels on multiple scales in their own analyses, to comprehend how other social scientists employ diverse kind of levels and scales, and to begun a dialogue with natural scientists about how different conceptions of scales and levels are related" (Gibson, Ostrom, Ahn 2000).

"One potential embodiment of a certificate of origin may be likened to a passport that accompanies genetic resources, either through their entire history from collection to use ('cradle to grave') or only for certain transactions such as patent applications or products approvals. It has also been suggested that certificates may play a role in monitoring transboundary movement of genetic resources with customs authorities taking a role in controlling illegal flow of resources (Tobin, Cunningham, Watanabe 2004).

5 The role of ascertaining the origin of components of biological diversity in international relationships between states.

In summing up the analysis of Art. 3 and paragraph 4 of the preface, some issues need further clarification.

Both the economic and legal aspects must not create confusion as to the Convention's object configuration.

The provisions of paragraph 4 of the preface and of Art. 3 do not have any direct link with the definition of the Convention's object. Rather, they refer to a question of *jurisdiction*, specific to international law, concerning the recognition of States' sovereign rights.²³

Member-States assign the 'biological diversity' discipline to the supranational normative apparatus of the Convention, engaging themselves in its accomplishment on two different levels: within a State and in its relations with other States. It should be pointed out that the object regulated by the Convention includes the 'biological resources' and the 'resources' as they are indicated in Art. 3 paragraph 4 of the preface. But they are a *minus*, they are actually "*something else*" if compared with the real object of the Convention. "*Biological diversity*" has a much wider and more pervading range, meaning and application. The CBD is not a convention about presumed 'biological commodities', or about 'biodiversity products' alone.²⁴

It is true that the Convention precisely regulates the use of 'biological resources' and 'genetic resources' (an even more "limited" category), but always within, and with the utmost respect for, the widest constitutional plan focused on biodiversity.

Single states are obliged to comply with this regulative system by adapting their own national policies and legislations, with reference to the application of the Convention on their own national territory, and to the effects that can be produced over the biodiversity dynamics within other Member-States. Or in any case outside the limits of national jurisdiction.

Member States will have the opportunity to adopt their own environmental-economic policies (".....the sovereign right to *exploit* their own resources pursuant to their *own environmental policies*.....", Art. 3) only in compliance with this constitutional prescriptive framework of the Convention, describing principles and forms of 'biological diversity' discipline, acknowledging its 'public good' nature. In the case of compliance with the Convention, member States should be obliged to have mutual respect for their national policies and legislations.

It will be possible to adopt market-oriented '*sectorial*' policies and economic regulations, based on the exploitation of biological/genetic resources. But public control and intervention will always be necessary on the part of the State vis-a-vis internal relations, and by the Convention, with the participation of States, vis-a-vis relations among States.

Taking the concept even further, the biodiversity dynamic process in itself cannot be "*privatized*", in that it cannot be efficiently self-regulated by the *market*. The biological/genetic resources market can exist, but it will have to be regulated in accordance with the 'public nature' of the 'biological diversity' good and in favour of the society.

²³ For the purpose of our brief considerations, it is not necessary to recall further distinctions, object of the debate on States' sovereignty with reference to the "*common heritage of humankind*" or linked to the concept of "*common concern of humankind*"

²⁴ On the contrary, we should reiterate the fact that this is an agreement regulating the whole natural reproduction-production (socio-economic) system of biodiversity, while the single elements, being part of the natural dynamic, are also subject to the Convention. These same 'biological commodities' could, in the future, be subject to a specific discipline by CBD, when, say, as a result of climatic change, a plant variety would suffer from a drastic reduction in population and habitat.

Once the ‘*social choices*’ have been verified and, in particular, the precise “*object*” of the Convention identified, assessing the consequent “*constitutional institutional choice*” (public sector and market control), a further step is represented by the definition and assignment of rights.

The definition of rights outlined in the CBD’s *constitutional framework* is not sufficiently detailed. Following the procedure of the international conventions, it delegates the states to acknowledge the regulative system and its implementation at a national level. Nevertheless, the action of single states is not sufficient for the Convention’s provisions to be fully put in place, and a further supranational legislative measure is required.

Although some regulations of the Convention (in addition to the general provisions of the treaties of international law) provide for the observance of environmental-economic policies adopted by a third party in obedience to the CBD (otherwise, art. 3²⁵ would have no reason to exist) and also for the observance of national legislation concerning access to genetic resources (according to art. 8 and 15), in reality this does not happen.

The institutional mechanism is incomplete and does not allow the Convention to be operative.

Although a state can make all efforts to prevent violation of the CBD within its jurisdiction, it is, however, difficult to guarantee full control since anyone can import or utilize biological resources without their origin being declared or ascertained.

There is therefore a need for international law to oblige states to implement a legislation regarding the ascertainment of the origin of biological/genetic resources.

But an even more unusual case could occur in the event of a ‘triangular’ transfer of biological/genetic resources. For example, if such resource were to pass through a third state that is less attentive to the requirements of the CBD or simply lacks control measures, before reaching its destination, the recipient country (meaning the country receiving a resource), even if it were to adopt the necessary measures to comply with the CBD and be prepared to respect national regulations on access issued by other States, it would not be able to trace the origin of the resource. Moreover it would have no chance of fulfilling its international obligations.

²⁵ “States have, in accordance with.....the principles of international, law the sovereign right to exploit *their own* resources pursuant to *their own environmental policies*”

6 Some proposed functions of the Certificate of Origin of Biological/Genetic Resources.

The Certificate of Origin of Biological/Genetic Resources - legally recognised at an international level - would therefore have a range of functions that are social-scientific and/or institutional-economic in nature, and are interconnected:

1. It would satisfy needs of *Research, Science and Knowledge Systems* in general (informal/local and formal).
2. It would allow the *subject* (state, community) to be recognised as *responsible for the conservation-management* of those biodiversity dynamics and components whose *origins fall within its territory*.
3. It would legitimate the rights of a subject (state, community) to *manage-exploit* (and *realise the full potential of*) the interactions between local biodiversity dynamics and socio-economic systems. In concrete terms this would enable the entire life cycles of biological-genetic components to be managed/exploited, and bring “*value chains*” under control once again.
4. It would enable the state (and the community) to *gain increased awareness, to participate actively* and to *receive empowerment* through managing its biodiversity dynamic processes and *the entire life cycle* of its biological/genetic components.
5. It would enable the state (and the community) to acquire “management tools” and know-how for formulating *effective local-national-international policies for the conservation-exploitation* of ecological-economic-commercial “*value chains*” of biological/genetic components.
6. It would make it possible for a state or community to *avoid losing control over their own biological component/genetic resources*, and to *keep up to date with, and check, lines of research and scientific results based on these resources*. In this context the Certificate would have the following objectives.
 - i. Scientific objectives regarding *conservation* of ‘*centre of origin*’ ecosystem dynamics (of reproduction/production, of management/sampling etc.). Examples of this are: the discovery of previously un-known properties and applications, or the establishment of a connection between ‘*local phenotypical knowledge*’ and ‘*genotypical knowledge*’, leading to a better comprehension of a nutritional chain, or of interactions among ecosystem abiotic (i.e. soil acidity) and biotic elements.
 - ii. Scientific objectives aimed at improving subsistence conditions of communities. An example of this may be research lines followed by pharmaceutical or cosmetics industries on the gene pool of an underutilized plant variety that has particular international commercial potential. Additional advantages might be obtained using the same plant variety in different applications and with alternative purposes, at local markets or self-subsistence level.
 - iii. It would allow a state (or a community) to pursue further research, autonomously or in co-operation (even contractual) with interested countries and research centres. The provider country could agree, or impose in negotiations, specific lines of research which may not be of commercial interest. For example, we could imagine two lines of research on the same molecules; one on a neglected disease of local interest, and the other on a commercially viable pathology.

- iv. Scientific/commercial objectives to optimize sustainable exploitation of biological/genetic resources.
7. Economic objectives, aimed at reducing information asymmetries and transaction costs (moral risk, adverse selection).
8. Scientific objectives, aimed at reducing information asymmetries and transaction costs (moral risk, adverse selection). 'Scientific Research' is enhanced by increased knowledge on the origin of biological and genetic resources and their life cycles.
9. It enables *legal certainty* to be established. Legal certainty is a 'public good' not only in economic relationships, but also in scientific relationships.
10. It allows a state (and a community) to evaluate and control the dynamics, and the ecological-economic effects, deriving from the removal, the exploitation, and the market 'supply/demand' of a specific biological element/ genetic resource.
11. It allows the knowledge associated with biological elements/genetic resources to be identified, as well as that associated with reference communities.
12. It allows the recognition and the legitimation of local/indigenous communities and of knowledge associated with biological/genetic resources.

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