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## Building the Biodiversity Commons

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*Provision of free, universal access to biodiversity information is a practical imperative for the international conservation community — this goal should be accomplished by **promotion of the Public Domain** and by development of a **sustainable Biodiversity Information Commons** adapting emergent legal and technical mechanisms to provide a free, secure and persistent environment for access to and use of biodiversity information and data.*

### Problems

**Biodiversity Information.** A very extensive body of data and information has been accumulated concerning the world's biological diversity. These resources reside in universities, libraries, museums, government agencies, research institutions and conservation organizations as well as in the traditional knowledge of indigenous peoples. They are typically not coherently organized — nor integrated — so it is difficult for researchers to quickly and effectively find the data and information they need. Major investments continue to be made to expand this raw knowledge base. To date because these data and information are generally not coherently managed, even key stakeholders have only fragmentary, incomplete access to them.

Beyond the limitations imposed by inadequate management, the "ownership" or "intellectual property rights" (IPR) vested in these resources creates barriers to access for many stakeholders in the world biodiversity conservation community. When limitations of proprietary control are amplified by market-based charges for acquisition or use of data or information, barriers may be insurmountable. Compounding this problem is the conspicuous global disproportion in distribution of wealth and the huge continuing investment in unsustainable development met with inadequate levels of investment in conservation.

Thus, while weak management of information impedes the fully informed participation of many stakeholders in biodiversity conservation, marketbased cost barriers exclude entire sectors of the global community.

***The Information Gradient/Digital Divide.*** There has long been an "*information gradient*" that runs North to South and prevents most peoples in the South (as well as many in the North) from equitable, direct access to biodiversity information. This gradient is both digital *and* analog. (As an instance of the "analog" portion of this gradient, in Pakistan, prior to partition with India there was a single university; in the subsequent 50 years 32 universities and more than 100 colleges, training institutes and other specialized institutions of higher education have been founded<sup>1</sup>. A review of simple collections measures such as serial holdings in these university libraries reveals the extremity of the North-South disparity in distribution of information resources.)

Moreover, the ascendancy of the Internet, in particular with regard to the use of the Web, adds a layer of technological complexity and cost to an international information regime that is already severely inequitable. The gradient most adversely affects the communities most likely to engage in constructive conservation — the public sector, the applied conservation community (NGOs, etc.), the academic/education community and the research sectors. (These are, of course, overlapping sectors.)

***The "Second Enclosure" Movement.***<sup>2</sup> The past decade has seen the emergence of a "second enclosure" movement as information has increasingly been treated as a commodity subject to new proprietary restrictions. Even organizations *that do not seek direct profit* from information (e.g., many conservation organizations) are hesitant to make their data and information freely available for fear that they will be taken advantage of (i.e., be seen somehow to have incompetently "given away the store").

In this commercial information environment, market mechanisms and the assertion of "intellectual property rights" are incompatible with free, equitable and universal access to essential information and data for all members of the international community. The difficulties originally posed by proprietary restrictions on production of AIDS drugs are but one example of how the prevalent regime of intellectual property rights and laws can fail to serve the common good. As has happened in the case of AIDS drugs, international civil society must come to broad consensus concerning the classes of data and information whose necessity to the public good transcends the utility of market control or the requirements of corporate self-interest<sup>3</sup>.

## **Solution: Biodiversity Commons<sup>4</sup>**

***Public Domain.*** In Anglo-American law the notion of the "public domain" recognizes that there is broad social value to placing information in a public *commons* for free, general use by all (including commercial uses). Much conservation information and data can simply be placed in the public domain, and the international conservation community should support and encourage such placement. Instances of this class of information might include taxonomic names of organisms and a basic world database of protected areas.

However, there are many instances of information that are not in the public domain that present more complex rights management dilemmas. For example, some images owned

by professional photographers might be made available for not-for-profit conservation uses — particularly as low-resolution derivatives — but also could be licensed or sold as higher resolution digital objects for commercial use. Complexly composed data or information objects (involving information or data licensed from multiple sources) may similarly be inappropriate or unavailable for unconditional placement in the public domain.

**Information Commons.** An "information commons" defines a community of use and guarantees free unhindered access to data and information for that community within a defined information space. Such a commons is composed of public domain data and information as well as otherwise protected information that is made openly available and that limits the full exercise of intellectual property rights by rights holders. Producers of information may assign rights to such a commons (just as owners of real estate may grant development "easements" on their property to a conservancy) while maintaining traditional controls over their intellectual property rights in the larger international commercial market domain. This is sometimes described as a "conditional" (or even "impure") domain of use.

## Cost Factors

**Digital Information as a Public Good and as an Extensible Resource.** A unique property of information — particularly in digital form — is that it is *not a finite resource* in the sense that copies or additional increments of use of information and data, once created, have virtually zero transaction costs. Hence, the "tragedy of the commons"<sup>5</sup> syndrome does not apply. In economic terms, these digital resources are "nonrivalrous". This distinctive quality of digital information enables the provision of open access on the Internet at virtually no additional cost for each incremental user.

**True Costs of Information.** Of course, information does have costs associated with its creation, production, and dissemination, or with the building of a system of incentives to generate new or enhanced information. Recovery of costs is certainly legitimate — *to the extent that such efforts do not bar equitable access to and use of information and data that are essential public goods*. Thus, the fundamental heuristic questions are: *Does the information or data in question clearly serve the public interest (e.g., biodiversity conservation), and should access to such information be restricted by cost?* The issue of appropriate compensations (cost recovery) and incentives (financial or other) for producers of information must be frankly addressed in ways that do not contradict the requirements for free access. (Obviously, when constrained in this way, "cost recovery" is largely limited to other-than-conventional market-based strategies.)

A fundamental principle is that, in so far as possible, *all biodiversity information* from its inception should be dedicated to free not-for-profit, research, education and conservation uses and planning for cost recovery should embrace the fundamental goal of free universal access. (Constraints on this principle may be required in order to extend protections to species or communities subject to targeted exploitation for example, rare orchids, etc.)

By careful design and modeling, it is possible to create a technical, legal and policy environment that allows creators/contributors of data or information to permit use to some defined community of conservation stakeholders while maintaining the possibility of cost-recovery (or even for-profit revenues). For example, it is possible that commercial publishers could assign rights to the Commons for selected papers or articles within journals — thus conditionally participating — labeling the selected articles with the "Biodiversity Commons" logo <sup>6</sup>.

## **Attribution and Information Integrity**

***Non-financial Compensation/Incentives: Integrity and Attribution/Impact.*** The producers of information have a responsibility to conserve the integrity of their information products, and thus they legitimately expect full respect *for the integrity of their information products* — whether made part of the public domain information or of a commons/conservancy. In the sciences particularly, this expectation of respect for original integrity of information or data is primarily a *cultural norm*. Disrespect for the integrity of information or data results in the discrediting of resulting work and in shunning of the culpable parties.

In addition, creators of information have professional and institutional rights to full attribution/credit for their products. In the current networked digital environment, highly sensitive tools for reporting information use and impact are available; the best possible technologies for measuring and reporting use/impact should be applied to return to responsible creators of information or data, measures of impact of their work. Mechanisms for reporting complex (secondary, tertiary, etc.) uses must also be developed. All such mechanisms must, of course, pay full respect to legitimate concerns for privacy and confidentiality.

## **Implementation Considerations**

Creation of a Biodiversity Information Commons requires: (a) the establishment of processes and mechanisms for identification, evaluation and selection of relevant data; (b) a thorough understanding of international laws and conventions (e.g., Convention on Biological Diversity<sup>7</sup>, World Intellectual Property Organization<sup>8</sup>) and relevant regional and national laws and agreements, including intellectual property rights; and (c) the design and implementation of a fully adequate technical environment for support and sustenance of such a commons.

## **What is to be done?**

***Proposed, as a solution, the creation of a Biodiversity Commons.***

The international conservation community should:

- Create a "Biodiversity Commons" and policies for administration and governance.

- Such policies must be developed with full respect for the right of indigenous peoples and of developing countries to control and benefit from their cultural or national biological resources.
- Clearly articulate and promote this model in all appropriate venues.
- Design and implement a sustainable Web-based Commons environment.  
*This design effort will include but not be limited to:*
  - Creating a "clearinghouse mechanism" to assist in the most efficient possible clearance of rights for inclusion of all suitable legacy and prospective information in the Commons.
  - Identification or creation of mechanisms for optimal reporting on attribution, use/impact of information. (Providing contributors of such information *full attribution* and *best possible reporting on use and impact of their information.*)
  - Defining the best available skills, tool sets and methods for:
    - digitization and data capture (micro-processing) at the institutional/organizational level, including the development of local capacity (training, skills and tools) to digitally capture metadata and full-text information.
    - dissemination of information (macro-processing) at the network/Internet level, including design of a Web-based system of protocols for donation of information and/or full documents (to a centrally maintained repository) and for sustenance of a distributed system of repositories. (The Open Archives Initiative (OAI) model seems directly relevant to this effort.)
    - provision of assistance to contributors in acquisition and use of these tools and methods.

For the Commons initiative to succeed, broad sectors of the conservation, research and education community will need to participate and provide support. The long-term success of the Biodiversity Commons initiative may determine *not* whether the South is ever "granted a level playing field" but whether the South is — in a very practical way — allowed on the field at all.

## Notes

[1] Syed Haider Abbas Zaidi, "Higher Education Pakistan."  
<[http://www2.unesco.org/wef/f\\_conf/000000e2.htm](http://www2.unesco.org/wef/f_conf/000000e2.htm)>.

[2] Boyle, James. The second enclosure movement and the construction of the public domain. <<http://www.law.duke.edu/pd/papers/boyle.pdf>>.

[3] See for example: <<http://www.scidev.net/dossiers/overview.asp?xc=A005&dossiename=Intellectual%20Property>>.

[4] Reichman, Jerome H. and Paul F. Uhlir, Promoting Public Good Uses of Scientific Data: A Contractually Reconstructed Commons for Science and Innovation.  
<<http://www.law.duke.edu/pd/papers/ReichmanandUhlir.pdf>>.

[5] Hardin, Garret. The tragedy of the commons. Science, New Series, Vol. 162, Issue 3859 (Dec. 13, 1968) 1243-1248.

[6] The logo displays as: **biodiversitycommons**

[7] Convention on Biological Diversity <<http://www.biodiv.org/>>.

[8] World Intellectual Property Organization<<http://www.wipo.org/>>.

## **Convention on Biological Diversity**

### **Article 16. Access to and Transfer of technology**

1. Each Contracting Party, recognizing that technology includes biotechnology, and that both access to and transfer of technology among Contracting Parties are essential elements for the attainment of the objectives of this Convention, undertakes subject to the provisions of this Article to provide and/or facilitate access for and transfer to other Contracting Parties of technologies that are relevant to the conservation and sustainable use of biological diversity or make use of genetic resources and do not cause significant damage to the environment.
2. Access to and transfer of technology referred to in paragraph 1 above to developing countries shall be provided and/or facilitated under fair and most favourable terms, including on concessional and preferential terms where mutually agreed, and, where necessary, in accordance with the financial mechanism established by Articles 20 and 21. In the case of technology subject to patents and other intellectual property rights, such access and transfer shall be provided on terms which recognize and are consistent with the adequate and effective protection of intellectual property rights. The application of this paragraph shall be consistent with paragraphs 3, 4 and 5 below.
3. Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, with the aim that Contracting Parties, in particular those that are developing countries, which provide genetic resources are provided access to and transfer of technology which makes use of those resources, on mutually agreed terms, including technology protected by patents and other intellectual property rights, where necessary, through the provisions of Articles 20 and 21 and in accordance with international law and consistent with paragraphs 4 and 5 below.
4. Each Contracting Party shall take legislative, administrative or policy measures, as appropriate, with the aim that the private sector facilitates access to, joint development and transfer of technology referred to in paragraph 1 above for the benefit of both governmental institutions and the private sector of developing countries and in this regard shall abide by the obligations included in paragraphs 1, 2 and 3 above.
5. The Contracting Parties, recognizing that patents and other intellectual property rights may have an influence on the implementation of this Convention, shall cooperate in this regard subject to national legislation and international law in order to ensure that such rights are supportive of and do not run counter to its objectives.

## **Convention on Biological Diversity**

### **Article 17. Exchange of Information**

1. The Contracting Parties shall facilitate the exchange of information, from all publicly available sources, relevant to the conservation and sustainable use of biological diversity, taking into account the special needs of developing countries.

**2. Such exchange of information shall include exchange of results of technical, scientific and socio-economic research, as well as information on training and surveying programmes, specialized knowledge, indigenous and traditional knowledge as such and in combination with the technologies referred to in Article 16, paragraph 1. It shall also, where feasible, include repatriation of information.**



## **Convention on Biological Diversity**

### **Article 18. Technical and Scientific Cooperation**

1. The Contracting Parties shall promote international technical and scientific cooperation in the field of conservation and sustainable use of biological diversity, where necessary, through the appropriate international and national institutions.
2. Each Contracting Party shall promote technical and scientific cooperation with other Contracting Parties, in particular developing countries, in implementing this Convention, inter alia, through the development and implementation of national policies. In promoting such cooperation, special attention should be given to the development and strengthening of national capabilities, by means of human resources development and institution building.
3. The Conference of the Parties, at its first meeting, shall determine how to establish a clearing-house mechanism to promote and facilitate technical and scientific cooperation.
4. The Contracting Parties shall, in accordance with national legislation and policies, encourage and develop methods of cooperation for the development and use of technologies, including indigenous and traditional technologies, in pursuance of the objectives of this Convention. For this purpose, the Contracting Parties shall also promote cooperation in the training of personnel and exchange of experts.
5. The Contracting Parties shall, subject to mutual agreement, promote the establishment of joint research programmes and joint ventures for the development of technologies relevant to the objectives of this Convention.

#### *APPENDIX 2*

### **Some Possible Working Definitions**

- "data" - observations or measurements recorded and reported in a standard way
- "experience" - personal or collective recollection and interpretation of events
- "information" - reasoned associations of data and experience
- "knowledge" - rational assumptions derived from the analysis of information and experience , presumed to be "true" and "reliable"