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**Food and Agriculture
Organization of the
United Nations**



The International Treaty
ON PLANT GENETIC RESOURCES
FOR FOOD AND AGRICULTURE

Item 4 of the Provisional Agenda

**INTERNATIONAL TREATY ON PLANT GENETIC RESOURCES
FOR FOOD AND AGRICULTURE**

**THIRD MEETING OF THE SCIENTIFIC ADVISORY COMMITTEE ON THE
GLOBAL INFORMATION SYSTEM**

Rome, Italy, 21 – 22 June 2018

**Access and Use of Plant Genetic Resources Information through the
Global Information System**

I. INTRODUCTION

1. This document relates to the component of the vision of the Global Information System (GLIS) dealing with the promotion of transparency of rights and obligations related to accessing, sharing and using information associated with germplasm, and the establishment of ways to exercise those rights and obligations within the GLIS. The programme of work that accompanies the vision foresees the analysis of the institutional, organizational, policy and legal factors for PGRFA information access, sharing and use in the context of the provisions of the International Treaty, in particular Articles 12 and 13 on the Multilateral System.
2. In the previous biennium, the Secretariat initiated the above components of the vision and programme of work in several ways. In the light of policy evolutions in multiple fora, it introduced the subject of access to and use of genomics information on PGRFA. It also presented this Committee with definite legal questions of immediate relevance to the deployment of the Digital Object Identifiers (DOIs) functions of GLIS, such as the use of DOIs by breeders and the terms of use of the GLIS portal.
3. Based on the guidance of the Governing Body at its Seventh Session, this document updates the Committee on developments in relevant fora, which could be taken into account in the work the Committee, in relation to digital sequence information, as requested by the Governing Body. The analysis in this document may also be reviewed by the Committee in order to conduct further practical work on the policy and legal components of the vision and programme of work on GLIS.

**II. GENETIC SEQUENCE DATA WITH RESPECT TO PLANT GENETIC RESOURCES
FOR FOOD AND AGRICULTURE**

4. In line with the position of the Governing Body and the on-going consideration of terminology in the context of the Convention on Biological Diversity (CBD), and following consultations with the Co-Chairs of this Committee, the term “digital sequence information” is utilized interchangeably with “genetic sequence data” in this document, without any prejudice to the possible definition of terminology by this Committee and the Governing Body.
5. At its Seventh Session, the Governing Body considered the question of digital sequence information and provided some guidance on further work to be done or issues to be addressed.

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6. In relation to the preparation of the Multi-Year Programme of Work of the Governing Body, the Governing Body, by Resolution 13/2017, invited Contracting Parties, other governments, relevant stakeholders and individuals with relevant expertise to provide information on: terminology, actors involved, the types and extent of uses, the relevance for food security and nutrition. The Governing Body will consider at its Eighth Session the potential implications of the use of “digital sequence information” on genetic resources for the objectives of the International Treaty, and to consider it for inclusion in the MYPoW at that meeting. The Governing Body further requested the Secretary to compile the views in order to facilitate consideration by the Governing Body, at its Eighth Session, of the potential implications of the use of “digital sequence information” on PGRFA for the objectives of the International Treaty, including exchange, access and the fair and equitable sharing of the benefits arising from their use.

7. In relation to the enhancement of the functioning of the Multilateral System, the Seventh Session of the Governing Body considered a proposal for the consolidated text for the revised Standard Material Transfer Agreement (SMTA) that reflected the concept of digital sequence information through a new definition of “genetic parts and components”. There was no consensus on whether and how to reflect issues related to digital sequence information in the text of the revised SMTA.¹

8. In relation to the GLIS, the Governing Body, by Resolution 5/2017, requested the Secretary to include in the Terms of Reference of the this Committee, the consideration of scientific and technical issues of relevance to genetic sequence information, as far as it is generated from the use of PGRFA and related to the implementation of GLIS. By Resolution 2/2018, the Governing Body requested the Secretary to notify the outputs of the work by the Committee to Contracting Parties and all relevant stakeholders.

9. In order to determine how to implement the mandate received from the Governing Body through Resolution 5/2017, the Committee may take into account, developments that occurred other fora, in particular the CBD, where the multilateral process related to genetic sequence data has been ongoing.

10. This Committee may recall that, in 2016, the CBD Conference of the Parties established an *Ad Hoc* Technical Expert Group to consider digital sequence information. A fact-finding and scoping study was presented to the Group, together with the views of governments and other stakeholders.² A non-exhaustive synthesis of findings of the study is presented below. Although not directly related to the GLIS in a governance perspective, these findings may offer general elements to consider in the implementation of the GLIS vision and programme of work.

11. The study examined how genetic sequence data are accessed, stored and managed. According to the study, a remarkable increase in data flow and use is occurring in public databases, despite the fact that some datasets may not be entered into international public databases due to concerns about confidentiality, control and benefit-sharing. The efforts to standardize and unify terminology are noted, and so is the increasing inclusion of environmental context data that may simplify the identification of source countries.

12. The study also reviews tools to manage access to and use of genetic sequence data in repositories, such as notifications on databases and websites, click through agreements, open source MTAs and user agreements. In this regard, the study explains how benefit-sharing may be contingent on different policy and legal approaches to access of genetic sequence data in databases. Several variations exist within full open access, with public domain on one end, and fees or subscriptions for access and use control of the data, on the other end. Open source is situated in between the two and is a form of controlled, managed access that attaches some conditions to the use of data. In a monetary benefit-sharing perspective, the study concludes that, in most cases, the commercial use of genetic sequence data is subject to an agreement with the

¹ See Resolution 2/2017.

² Both the study and the stakeholder submissions can be accessed through: <https://www.cbd.int/abs/dsi-gr/ahteg.shtml>

data contributor once commercial interest or use are established. With regard to non-monetary benefit-sharing, the study records the views of some stakeholders according to which access to publicly available databases, whose hosting, maintenance and utilization costs are covered by the host countries (mostly the US, European countries and Japan), is a significant benefit to the global community. The study also reports the concerns of others according to which access to databases and technology are an insufficient benefit for countries rich in biodiversity that do not possess sufficient research and infrastructure capacity to take advantage of such access.

13. The Ad Hoc Technical Expert Group held its meeting in February 2018 and developed recommendations to the CBD Subsidiary Body on Scientific, Technical and Technological Advice.³ The Expert Group considered several approaches on terminology and the different types of digital sequence information – one category being information on the genetic and/or biochemical composition of the genetic resources and another being observational data that provide contextual information on the genetic resource. The Group also noted that “genetic sequence data” is a clearly understandable term in the scientific community. The common understanding within the Group was that information providing an indication of the genetic and/or biochemical composition of the genetic resource at some point originated from a physical source.

14. In addition, the Group considered the information management aspects of the subject and highlighted a number of issues. Open access plays a critical role in facilitating conservation and sustainable use of genetic resources but, as the technical ability to generate, analyse and use digital sequence information is limited to many countries, there is a need for more capacity building and technology transfer. Accessing and using digital sequence information for research is enabled by databases. In particular, publicly accessible databases are instrumental to social and public benefits from access to and use of digital sequence information. Despite the fact that different views were expressed concerning monitoring of the use of digital sequence information for benefit-sharing purposes via controlled access to databases, and that the content of proprietary data is not publicly known, the Group agreed that restricting the use of publicly accessible data would not be desirable. In addition, the Group noted that a framework for traceability, although desirable to some and opposed by others as creating an unnecessary barrier to data access and use, could be facilitated through the value chain by the use of unique identifiers.

15. In the implementation of the new work stream on digital sequence information, the Secretariat of FAO’s Commission on Genetic Resources for Food and Agriculture has recently released its draft exploratory, fact-finding scoping study on digital sequence information on genetic resources for food and agriculture.⁴ With regard to storage, exchange and sharing of digital sequence information, the study reports that such information is stored in electronic, digital media and that the amount of private information is unknown. The study also points to the fact that the infrastructure for the approximately 1 700 online, publicly accessible databases is mainly in developed countries and that continuous funding in open access mode is not assured. In the study, it is also argued that publicly funded databases put minimal or no restrictions on access to digital sequence information but that such a policy may not be sufficient for equitable access, as public availability is not, per se, a benefit, but rather a pre-requisite for any benefits that could arise from the use of information.

16. This Committee may also recall that a scoping study on genomic information by independent experts, which the Secretariat of the International Treaty commissioned, was presented at a special event, held back-to-back with the Seventh Session of the Governing Body.⁵ The study noted how the proliferation of data/repositories, the multiplication of users and the varied importance of information about provenance may make it increasingly difficult to identify the source of genetic sequence data. The study also reported that database owners, sequencing

³ The report of the meeting is available at:

<https://www.cbd.int/doc/c/4f53/a660/20273cadac313787b058a7b6/dsi-ahteg-2018-01-04-en.pdf>

⁴ The study is available at: <http://www.fao.org/3/I9371EN/i9371en.pdf>

⁵ The study and the presentations delivered at the special event can be accessed through: <http://www.fao.org/plant-treaty/seventh-governing-body/special-event/en/>

companies and other data generators/curators are not keeping or requesting information about the material source of digital sequence information. In terms of monitoring of use, the chain of transmission is often not transparent or easily documented, including due to the limited interest of database operators to facilitate monitoring. In the study, it was observed that monitoring data access and use may be contingent on some mechanism or incentive to build standards for exchange across multiple users and uses.

17. The study reported that a significant portion of the value of digital sequence information is in its aggregation in accessible databases. Nevertheless, it appears difficult for the database and research community to establish an aggregated and standardized system at a desirable scale, due to the multiplicity of holders of data collections, the distribution of data in a number of media and the diversity of standards, norms and attitudes.

18. Recently, a technological approach to addressing some of the issues raised above has been suggested. The application of distributed ledger technology, e.g. blockchain, to genetic resources operations would allow for providers and users to expedite and record activities and transactions related to genetic material and data (for instance, genetic material sequenced and mapped; registered and certified immutably; combined with other biological and knowledge assets; searched through engines and exchanged through smart contracts that codify rights and obligations; remunerated through a distributed payment infrastructure; exposed for further access through software interfaces).⁶ In the human health sector, blockchain is applied to enable access to data services and analysis while preserving the integrity and confidentiality of collections of datasets.⁷ In the context of plant genetic resources for food and agriculture, these new technologies and their potential application to existing and new operations may require further study.

III. OBJECTIVE 4 OF THE PROGRAMME OF WORK

19. From the above synthesis, three generalizable policy and legal issues emerge, which may be of relevance to the areas of the GLIS vision and programme of work dealing with transparency of rights and obligations, and institutional, organizational, policy and legal factors for PGRFA information access, sharing and use.

20. One relates to the importance of developing a clear understanding of database access and use conditions in order to promote transparency of rights and obligations. Terminology such as open access, public domain, public accessibility, open source and controlled/managed access is applied interchangeably, without a clear understanding of the actual conditions of access and use, and its implications on intellectual property.

21. Another aspect revolves around a capability issues around data access, sharing and use. By including capacity development and partnerships in its vision and programme of work, the GLIS addresses not only resource availability but resource utilization as well. Examining the key role of capacity building and technology transfer may be necessary in order to promote a shared, global vision of the value of information for the objectives of conservation, sustainable use and equitable benefit-sharing.

22. A third element revolves around the opportunity to conceptualize open, public domain access in direct, causal correlation with benefit-sharing, thus in an equity dimension. The relationship between open data and development is being raised and addressed in recent literature,

⁶ World Economic Forum; Harnessing the Fourth Industrial Revolution on Land. Towards an Inclusive Bioeconomy; January 2018, Geneva.

⁷ Dennis Grishin Kamal Obbad Preston Estep Mirza Cifric Yining Zhao George Church; Nebula Genomics. Blockchain-enabled genomic data sharing and analysis platform. White Paper; 7 February 2018.

for instance by arguing that implementing open data requires a context-sensitive framework that promotes equitable North-South research collaboration.⁸

23. The Secretariat remains available to assist the Committee with any additional information or technical inputs that the Committee may deem as necessary in providing advice to the Secretary and in order to develop outputs for the consideration of the Eighth Session of the Governing Body.

IV. ADVICE SOUGHT

24. With regard to digital sequence information/genetic sequence data, the Committee is invited to consider how it will respond to the request of the Governing Body at its Seventh Session. In particular, it is suggested that the Committee, following the specific guidance of Resolution 5/2017:

- define cases where digital sequence information/genetic sequence data are generated from the use of PGRFA, and are related to the implementation of the GLIS;
- determine what scientific and technical issues, which may include those that emerge from the international processes reviewed above, are of relevance to genetic sequence data in the ambit of the International Treaty and the GLIS in particular;
- develop its analysis and the outputs for the Secretariat to circulate to Contracting Parties in preparation for the Eighth Session of the Governing Body.

25. In the conduct of its work, the Committee may wish to establish synergies with the processes related to the enhancement of the functioning of the Multilateral System and the Multi-Year Programme of Work, as set forth in Resolutions 2/2017 and 13/2017.

26. The Committee may also consider recommending that the Secretariat continues monitoring policy, legal and technological developments which may influence the deployment of GLIS functions in accordance with the vision and programme of work, and to inform the Committee at next meeting.

27. The Committee may further consider the elements presented in this document, beyond the specific case of genetic sequence data and for other categories of PGRFA information, in order to determine priorities for the analysis, foreseen in the GLIS programme of work, of the institutional, organizational, policy and legal factors for PGRFA information access, sharing and use in the context of the provisions of the International Treaty.

⁸ Louise M. Bezuidenhout, Sabina Leonelli, Ann H. Kelly, Brian Rappert; Beyond the digital divide: Towards a situated approach to open data, *Science and Public Policy*, Volume 44, Issue 4, 1 August 2017, pp. 464–475.

David Serwadda, Paul Ndebele, M. Kate Grabowski, Francis Bajunirwe, Rhoda K. Wanyenze; Open data sharing and the Global South- Who benefits?, *Science*, Volume 359, Issue 6376, 9 February 2018, pp. 642-643.