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Promotion and protection of all human rights, civil, political, economic, social and cultural rights, including the right to development

Report of the Special Rapporteur in the field of cultural rights, Farida Shaheed

The right to enjoy the benefits of scientific progress and its applications*

Summary

In its resolution 19/6, the Human Rights Council extended, for a period of three years, the mandate of the current mandate holder as a special rapporteur in the field of cultural rights. The Special Rapporteur is pleased to submit her third thematic report to the Council under this new title.

In the present report, the Special Rapporteur focuses on the right to enjoy the benefits of scientific progress and its applications. The Special Rapporteur stresses the strong link of this right with the right to participate in cultural life, as well as other human rights. She considers that its normative content includes (a) access by everyone without discrimination to the benefits of science and its applications, including scientific knowledge; (b) opportunities for all to contribute to the scientific enterprise and freedom indispensable for scientific research; (c) participation of individuals and communities in decision-making and the related right to information; and (d) an enabling environment fostering the conservation, development and diffusion of science and technology.

The Special Rapporteur makes a number of recommendations, most of which could be implemented in a timely manner. She also recommends that further work be conducted to enhance the conceptual clarity of the right to enjoy the benefits of scientific progress and its applications. A robust discussion is needed, including on her proposal to adopt a public good approach to knowledge innovation and diffusion.

* Late submission.

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Contents

I. Introduction

1. The right of everyone to share in scientific advancement and its benefits is enshrined in the Universal Declaration of Human Rights and, in slightly different terms, as the right to benefit from scientific progress and its applications in the International Covenant on Economic, Social and Cultural Rights. It is also recognized in other international and regional human rights instruments. The scope, normative content and obligations of the State under this right, referred herein as "the right to science", remain underdeveloped while scientific innovations are changing human existence in ways that were inconceivable a few decades ago.

2. The right to science is usually regarded as a means to advance the realization of other human rights and to address "the needs common to all humanity"[1] or in terms of the "potentially adverse consequences for the integrity, dignity and human rights of the individual".[2] Although the potential human rights implications of scientific advances must be considered, they do not suffice to define the scope of the right. It is essential to consider what the right to science means as a human right.

3. The right to science tends to be considered in isolation from the right to participate freely in the cultural life of the community, to which it is usually juxtaposed with relevant instruments. The Special Rapporteur views these rights as inherently interlinked, since both relate to the pursuit of knowledge and understanding and to human creativity in a constantly changing world.

4. In the present report, the Special Rapporteur hopes to catalyse a robust discussion among States, scientific researchers and practitioners, civil society groups and the private sector to further elucidate the right to science.

5. In order to collect the views of States and other stakeholders, the Special Rapporteur disseminated a questionnaire on the right to enjoy the benefits of scientific progress and its applications. Responses were received from 21 States and 13 other stakeholders (see annex I). On 5 and 6 December 2011, the Special Rapporteur convened an experts' meeting on the issue (see annex II). She also convened a public consultation in Geneva on 7 December 2011. The Special Rapporteur is grateful to all those who contributed.

II. The right to benefit from scientific progress and its applications: legal and conceptual framework

A. International and regional standards

6. Various international and regional provisions demonstrate a wide consensus with regard to the need to ensure the right to science for all persons. Numerous other texts on a wide range of related issues, such as health, the environment, development, and information and communication technologies are referred to below, where relevant.

[1] Declaration on Social Progress and Development, General Assembly resolution 2542 (XXIV), preamble.

[2] Vienna Declaration and Programme of Action (A/CONF.157/23).See also Proclamation of Teheran, Final Act of the International Conference on Human Rights, para. 18.

1. International law

7. The right to share in scientific advancement and its benefits is recognized in article 27 of the Universal Declaration of Human Rights and, in slightly different terms, in article 15 (1)(b) of the International Covenant on Economic, Social and Cultural Rights. Although both texts link it with the right to take part in cultural life and to the protection of the moral and material interests resulting from scientific, literary or artistic production, the right to science is usually considered in isolation. The juxtaposition with the right to culture has often been viewed as coincidental. The Special Rapporteur believes that, to the contrary, the rights to science and culture should be read together and in conjunction with, in particular, the right of all peoples to self-determination and the right of everyone to take part in the conduct of public affairs (see also paragraph 21 below).[3]

8. The International Covenant on Economic, Social and Cultural Rights further stipulates the obligations of States Parties to promote the conservation, the development and the diffusion of science and culture (art. 15 (2)), to respect the freedom indispensable for scientific research and creative activity (art. 15 (3)) and to recognize the benefits to be derived from the encouragement and development of international contacts and cooperation in the scientific and cultural fields (art. 15 (4)). The Special Rapporteur considers the calls for international cooperation in the area of science and transfers of technologies, as made in numerous United Nations and other documents, as particularly important for realizing the right to science for all.

2. Regional law

9. According to the Charter of the Organization of American States, States "shall extend among themselves the benefits of science and technology by encouraging the exchange and utilization of scientific and technological knowledge" (art. 38). The American Declaration on the Rights and Duties of Man upholds the right of every person "to participate in the benefits that result from intellectual property, especially scientific discoveries" and "to the protection of his moral and material interests as regards his inventions or any literary, scientific or artistic works of which he is the author" (art. XIII), while article 14 of the Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights includes the right to science in language similar to the International Covenant on Economic, Social and Cultural Rights. The right has yet to be addressed by the Inter-American Commission on Human Rights and the Inter-American Court on Human Rights, although the Commission recently stressed the urgent need for the right to be defined so that it may be applied in practice.[4]

10. Article 42 of the Arab Charter on Human Rights recognizes the right of everyone "to take part in cultural life and to enjoy the benefits of scientific progress and its application", together with the obligations of States to "respect the freedom of scientific research and creative activity", to "ensure the protection of moral and material interests resulting from scientific, literary and artistic production" and to enhance cooperation "at all levels, with the full participation of intellectuals and inventors and their organizations, in order to develop and implement recreational, cultural, artistic and scientific programmes."

11. Article II (2) of the Charter of the African Union identifies scientific and technical cooperation as essential for meeting its goals. Articles 4 (1)(h) and 12 (2)(b) of the Protocol on the Rights of Women in Africa of the African Charter on Human and Peoples' Rights specifically prohibits medical experimentation on women without their informed consent,

[3] International Covenant on Civil and Political Rights, art. 25.

[4] See www.oas.org/es/cidh/audiencias/TopicsList.aspx?Lang=en&Topic=27.

and requires States to take specific measures to promote education and training for women, particularly in the fields of science and technology.

12. Article 13 of the European Charter of Fundamental Rights requires that scientific research be "free of constraint". The Convention on Human Rights and Biomedicine of the Council of Europe contains, in the preamble thereto, important provisions, including "the need for international cooperation so that all humanity may enjoy the benefits of biology and medicine"; it also declares that the "interests and welfare of the human being shall prevail over the sole interest of society or science" (art. 2). Importantly, the need for appropriate public consultation and debate is underlined (art. 28). The Convention also provides clear guidelines regarding the conditions under which research involving human persons may be conducted.

B. Domestic implementation

13. According to information provided to the Special Rapporteur through, inter alia, the responses to her questionnaire, the right to enjoy the benefits of scientific progress and its applications is recognized explicitly in the constitutions of at least four countries (Armenia, Ecuador, Paraguay, Republic of Moldova). Numerous other constitutions protect specific aspects of this right, such as the right to have access to science (Brazil, Colombia, Dominican Republic, Estonia, Kyrgyzstan, Lithuania, Yemen); promotion of scientific research and infrastructure development (Argentina, Brazil, Chile, China, Croatia, Democratic People's Republic of Korea, Ecuador, Guatemala, Iran (Islamic Republic of), Korea, Kuwait, Madagascar, Malta, Mexico, Switzerland, the former Yugoslav Republic of Macedonia, Uzbekistan); promotion of scientific research specifically for social benefit (Brazil, Democratic Republic of the Congo, Ecuador); protection of scientific freedom (Afghanistan, Armenia, Azerbaijan, Belarus, Brazil, Bulgaria, China, Croatia, Czech Republic, Democratic Republic of the Congo, Ecuador, Egypt, Georgia, Hungary, Japan, Kazakhstan, Kyrgyzstan, Latvia, Madagascar, Portugal, the Republic of Korea, the Republic of Moldova, Spain, Switzerland, Tajikistan, the former Yugoslav Republic of Macedonia, Turkey, Ukraine, Uzbekistan); support for science education (Brazil, Colombia, Zambia); promotion of the dissemination and/or use of science and technology (Argentina, Colombia, Czech Republic, Democratic People's Republic of Korea, Dominican Republic, Ecuador, Georgia, Honduras); encouraging international cooperation in science and technology (Bosnia and Herzegovina); promotion of innovation and free public research (Switzerland); and support for private initiatives aimed at scientific progress (Costa Rica).

14. Key challenges confronting States include the lack of human capacity, in particular scientists; inadequate science education and trained teachers; insufficient equipment and infrastructure; a paucity of public or private funding; and absence of targeted national plans or programmes (see submissions by Costa Rica, Georgia, Guatemala, Mauritius, Peru, Serbia, Uruguay and Viet Nam). Additionally, some States mentioned a low level of intellectual property protection (Costa Rica, Mauritius), brain drain (Mauritius), lack of national scientific journals (Guatemala) and ineffective models of transfers of technology (Uruguay, Viet Nam). The need for more effective involvement of sectors of society that would benefit from research and development was also stressed (Uruguay). Furthermore, the diverse and dispersed character of a population may present challenges for realizing this right, particularly for marginalized groups with a diminished ability to safeguard their interests in the context of specific research projects (Canada, Viet Nam).

15. States have taken steps to address the above-mentioned challenges, especially in the area of scientific education and international cooperation. These steps include promoting scientific cooperation and connecting scientists internationally, offering scholarships and

student exchanges, sharing information, exchanging equipment, ensuring technology transfers and entering into technical cooperation agreements (Canada, Costa Rica, Germany, Greece, Japan, Peru, Serbia, Spain, Uruguay). Measures have been taken to promote access to the Internet, open access to scientific knowledge, the dissemination of scientific knowledge among the public and public participation in science-related matters. Specific programmes address disparities in access to scientific advances by, inter alia, women and persons with disabilities,[5] and in rural communities (Peru). Some States facilitate the participation of women in scientific enterprise (Germany, Greece, Japan, Serbia, Spain, Viet Nam).

C. Relationship with other human rights

1. The rights to science and culture: a strong link

16. The rights to science and culture are interlinked. Importantly, the Human Rights Council, in its resolution 10/23, established the mandate on cultural rights. In resolution 19/6, the Council renewed the mandate, deeming it necessary to reaffirm "he right of everyone to take part in cultural life and to enjoy the benefits of scientific progress and its applications.

17. The two rights have interesting similarities. Both relate to the pursuit of knowledge and understanding and to human creativity in a constantly changing world. The preparatory work on the Universal Declaration of Human Rights and the International Covenant on Economic, Social and Cultural Rights reflected the intention of the drafters to include a provision promoting universal access to science and culture.[6] In addition, it has been suggested that, at the signing of the Universal Declaration, "the United Nations had come to envision the sharing of scientific and cultural knowledge as something that could unite an international community – a common task that would contribute to cross-cultural understanding and yield a more secure world"[7] and that these international norms require a public good approach to knowledge innovation and diffusion".[8] This idea is reflected in the Constitution of the United Nations Educational, Scientific and Cultural Organization (UNESCO), mandated to protect "the world's inheritance of books, works of art and monuments of history and science" and to encourage international "cooperation in all branches of intellectual activity".

18. A prerequisite for implementing both rights is ensuring the necessary conditions for everyone to continuously engage in critical thinking about themselves and the world they inhabit, and to have the opportunity and wherewithal to interrogate, investigate and contribute new knowledge with ideas, expressions and innovative applications, regardless of frontiers. More precisely, the right to participate in cultural life entails ensuring conditions that allow people to reconsider, create and contribute to cultural meanings and manifestations in a continuously developing manner.[9] The right to enjoy the benefits of science and its applications entails the same possibilities in the field of science, understood as knowledge that is testable and refutable, including revisiting and refuting existing theorems and understandings. Finally, both cultural and science-related rights encompass

[5] See submission by the World Intellectual Property Organization (WIPO), pp. 11-13.

[6] See in particular Lea Shaver, "The right to science and culture", *Wisconsin Law Review*, 2010, p. 134. See also Mylène Bidault, *La protection internationale des droits culturels*, Bruylant, 2009, p. 431.

[7] L. Shaver, "The right to science and culture" (see footnote 6), p. 141

[8] Ibid., p. 128.

[9] A/HRC/14/36, paras. 30 and 51.

the right to benefit from the creativity of others while protecting the moral and material interests emanating from "any scientific, literary or artistic production".[10]

19. The bond between the right to science and the right to participate in cultural life is reflected in the discussions led by UNESCO on 16 and 17 July 2009, in Venice, Italy, involving academics and United Nations partners, including the Office of the United Nations High Commissioner for Human Rights (OHCHR), the Committee on Economic, Social and Cultural Rights, the World Intellectual Property Organization (WIPO) and the World Trade Organization (WTO), that culminated in the Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications. At the event, participants stressed that access to the benefits of scientific progress not only allowed improving one's socio-economic situation, but also gave the opportunity to take a meaningful part in the life of communities, whether they are local, national or international.[11] One example is new information communication technologies, which not only influence culture but are becoming an intrinsic part of culture as everyday practice. The rights to science and to culture should both be understood as including a right to have access to and use information and communication and other technologies in self-determined and empowering ways.

20. The link between the right to science and the right to culture can be further understood with regard to people's ability to "aspire". A growing body of literature suggests that the ability to aspire – namely, to conceive of a better future that is not only desirable but attainable – is an important cultural capability that needs to be supported and developed, especially among the marginalized and vulnerable.[12] Aspirations embody people's conceptions of elements deemed essential for a life with dignity. Never a mere individual exercise, aspirations are informed by, and in turn inform, communities of shared cultural values and draw upon cultural heritage, including accessible accumulated scientific knowledge. New scientific knowledge and innovations increase available options, thereby strengthening people's capacity to envisage a better future for which access to specific technologies may sometimes be pivotal.[13]

2. Linkages with other rights

21. Given the enormous impact that scientific advances and technologies have on the daily lives of individuals and peoples, the right to science must be read in conjunction with freedom of expression, including the freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers,[14] the right of everyone to take part in the conduct of public affairs, directly or through freely chosen representatives,[15] and the right of all peoples to self-determination.[16] The right to development as the "constant improvement of the well-being of the entire population and of all individuals on the basis of their active,

[10] Covenant on Economic, Social and Cultural Rights, art. 15.1 (c)

[11] The Right to Enjoy the Benefits of Scientific Progress and its Applications, UNESCO, Paris, 2009, p. 4.

[12] Arjun Appadurai, "The capacity to aspire: culture and the terms of recognition", in *Culture and Public Action*, Vijayendra Rao and Micheal Walton (eds.), Standford University Press, 2004. Available from www.laboratorio-suigeneris.net/IMG/pdf/The_Capacity_to_Aspire_pre-pub_.pdf.

[13] For example, see Philippa Smales"Migrant women domestic workers and freedom of communication in Taiwan: a case for barrier-free access to mobile phones as a basic right", Policy Brief for CITIGEN Asia Research Programme 2010-2012, IT for Change: Bengaluru, December 2011. Available from www.gender-is-citizenship.net/sites/default/files/citigen/CITIGEN_Policy_Brief%20_TT_Final_8Dec2011.pdf.

[14] International Covenant on Civil and Political Rights, art. 19.

[15] Ibid., art. 25.

[16] Article 1 of both international covenants on human rights.

free and meaningful participation in development and in the fair distribution of benefits resulting therefrom"[17] must also be taken into consideration.

22. Indeed, one key aspect of the right to science relates to the opportunities given to individuals and peoples to make informed decisions after considering both the possible improvements offered by scientific advances and their potential side effects or dangerous usages. One important aspect of the discussion is determining what is to be regarded as "benefits" or "scientific progress". This consideration must be guided by instruments such as Limburg principle 11, stressing that popular participation at all stages is "indispensable to achieving progress in realizing economic, social and cultural rights";[18] Principle 10 of the Rio Declaration on Environment and Development, which reiterates the importance of access to information and participation in decision-making processes; and the Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters.

23. The right to science is sometimes considered a prerequisite for the realization of a number of other human rights. The full use of technical and scientific knowledge is explicitly mentioned in article 11(2) (a) of the Covenant on Economic, Social and Cultural Rights with respect to the right to food.[19] The link with other human rights, such as the rights to health, water, housing and education, as well as the right to development and the emerging right to a clean and healthy environment, is also obvious.[20] Some national case law on access to health care can help to develop conceptual understanding of the right to science. In 2001, for example, the Supreme Court of Venezuela (Bolivarian Republic of) found that the failure of the Venezuelan Institute for Social Security to ensure a regular and consistent supply of the drugs needed by HIV-positive persons covered by it constituted, inter alia, a violation of the right to enjoy the benefits of scientific progress.[21]

III. Scope, normative content and obligations of States

A. Scope

24. Science must be understood as knowledge that is testable and refutable, in all fields of inquiry, including social sciences, and encompassing all research. The terms "benefits" of science and "scientific progress" convey the idea of a positive impact on the well-being of people and the realization of their human rights. The "benefits" of science encompass not only scientific results and outcomes but also the scientific process, its methodologies and tools.

[17] Declaration on the Right to Development, preamble.

[18] E/CN.4/1987/17, annex.

[19] See Olivier De Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food: From Conflict to Complementarity", *Human Rights Quarterly*, Vol. 33, No. 2, May 2011, pp. 304-350. See also the reports of Mr. De Schutter as Special Rapporteur on the right to food (such as A/64/170).

[20] See, for example, Human Rights Council resolution11/8 , para. 2; A/48/268, sect. III; Committee on Economic, Social and Cultural Rights, general comment No. 6, para. 42; and Commission on Human Rights resolution 2003/71 .

[21] López, Glenda y otros c. Instituto Venezolano de los Seguros Sociales (IVSS) s/ acción de amparo. Expediente 00-1343. Sentencia No. 487.

B. Normative content and related obligations of States

25. The normative content of the right to benefit from scientific progress and its applications includes (a) access to the benefits of science by everyone, without discrimination; (b) opportunities for all to contribute to the scientific enterprise and freedom indispensable for scientific research; (c) participation of individuals and communities in decision-making; and (d) an enabling environment fostering the conservation, development and diffusion of science and technology.

1. Access by all without discrimination

26. The right to science connotes, first of all, a right of access: scientific knowledge, information and advances must be made accessible to all, as stated in article 2 of the International Covenant on Economic Social and Cultural Rights, without discrimination of any kind as to race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status. Access must be to science as a whole, not only to specific scientific outcomes or applications.

27. The right to have access to scientific knowledge is pivotal for the realization of the right to science. At the juncture of the right to education and the right to information, it implies a right to science education, understood as a right to be introduced to and informed about main scientific discoveries and their applications, regardless of frontiers. It also entails education instilling a spirit of scientific inquiry.[22] Popularizing science outside schooling is also important. Interesting measures such as "science week", the introduction of "science cafés" and the opening of science museums with specific educational approaches contribute to this objective.[23]

28. Access to scientific information for researchers is essential. Some States have taken steps to promote such access. In Spain and the United States of America, for example, researchers principally supported through public funds must make public a digital version of their research no later than 12 months after publication.[24] Germany referred to the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, which may be signed by various stakeholders. The Special Rapporteur also notes with great interest the development of open-access journals and repositories, and the importance of mandatory open-access policies implemented by some universities and research institutions, which "incorporates local research into interoperable network of global knowledge, increases impact of local research, providing new contacts and research partnerships for authors, and removes professional isolation".[25]

29. Another aspect is the right to have access to scientific applications and technologies. One core principle is that innovations essential for a life with dignity should be accessible to everyone, in particular marginalized populations. The potential implications of scientific advances likely to have a significant impact on human rights, such as electricity, information and communication technologies, nanotechnology and synthetic biology, need attention.[26]

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[22] Submission by Observatoire des droits et de la diversité culturels.

[23] See submissions by Canada, Costa Rica, Germany, Guatemala, Japan, Mauritius and Spain .

[24] See also the submission from Georgia.

[25] See submission by EIFL – Knowledge without boundaries, in particular pp. 3-4.

[26] See for example Anita Gurumurthy, Parminder Jeet Singh, Gurumurthy Kasinathan, "Pro-poor access to ICTs – Exploring appropriate ownership models for ICTD initiative", available from www.itforchange.net/Pro-poor, and Thomas Alured Faunce, "Nanotechnology in global medicine and

30. States should ensure that the benefits of science are physically available and economically affordable on a non-discrimination basis.

31. The non-discrimination obligation demands eliminating both de jure and de facto barriers. In particular, positive steps must be taken for marginalized populations, such as people living in poverty and persons with disabilities, as well as the elderly,[27] women and children,[28] to ensure non-discriminatory access to scientific information, processes and products. Specific measures encompass eliciting the priority needs of such populations through a consultative process and facilitating targeted research by both public and private sector institutions.

32. As indicated in their responses to the questionnaire, some States have taken steps in this respect. For example, Uruguay encourages research with a high social impact and has established participatory mechanisms for identifying needs. Mauritius has established research groups to address priority issues, including with regard to food, water and building research capacity.[29] Furthermore, the Special Rapporteur was informed that Burkina Faso has addressed issues concerning food security, suitable rice varieties and the environment, science and technology solutions to poverty, and water management, particularly in the context of raising cattle.[30] Specific research is also being conducted in the area of Aboriginal health, rare diseases including those affecting unique ethnic groups, diseases associated with the elderly and the disabled.[31]

33. Incentives and purposive funding are being used to promote appropriate research; this includes "innovation prizes" in developed and developing countries to address societal needs, especially in the areas of health, food and the environment. Preceded by a consultative process, prizes expand opportunities for smaller innovators that would otherwise have no access to funding, and can bring together government, the private sector and philanthropic interests.[32]

34. Affordability is crucial and may require delinking research and development costs from product prices, as proposed by the World Health Organization in its global strategy and plan of action on public health, innovation and intellectual property.[33] The proposed innovative models enhance broad and affordable access, especially when they exclude time-limited legal monopolies that have the ultimate effect of increasing product prices. These could be applied to other areas as well. Intellectual property protection and product prices can also be delinked through innovation inducement prizes that reserve a percentage of prize monies for individuals and institutions ready to share knowledge, materials and technologies for product development. When combined with open-source dividend reward programmes, this encourages collaboration rather than competition.[34]

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human biosecurity: private interests, policy dilemmas and the calibration of public health law", *Journal of Law, Medicine and Ethics*, Vol. 35, No. 4, pp. 629-642, 512.

[27] See Committee on Economic, Social and Cultural Rights, general comment No. 6, para. 42.

[28] See, for example: UNESCO, Girls in Science and Technology Education: A Study on Access, Participation, and Performance of Girls in Nepal (2005);

[29] See also Spain.

[30] See Knowledge Ecology International, Selected Innovation Prizes and Reward Programs, KEI Research Note 2008:1, available from http://keionline.org/misc-docs/research_notes/kei_rn_2008_1.pdf.

[31] For example, in Canada, Spain and Greece.

[32] See National Research Council, *Innovation Inducement Prizes at the National Science Foundation*, Washington D.C., National Academies Press, 2007.

[33] See resolutions WHA 61.21 and 63.28.

[34] See http://healthresearchpolicy.org/content/open-source-dividend-prizes.

35. Other initiatives include the International Drug Purchase Facility (UNITAID), which extends access to most impoverished groups by means of funds generated through taxing airfare purchases to negotiate lower prices for essential medicines, accelerate the distribution of medicines and create incentives for developing new treatments. It has catalysed the development of nine new paediatric HIV medications, leveraged price reductions of up to 60 per cent for several key treatments, and greatly enhanced access to treatment for children.[35]

36. Access to the Internet and information communication technologies is an increasingly important area of action.[36] The Committee on Economic Social and Cultural Rights stressed that Governments must respect and protect freedom of information and expression, including on the Internet to ensure the implementation of article 15 of the Covenant.[37] With the Internet emerging as a critical platform for scientific and cultural flows and exchanges, freedom of access to it and maintaining its open architecture are important for upholding the right of people to science and culture.

37. Significant gaps in computer use and access to the Internet for reasons of income, education, gender and geographic location persist.[38] In response, interesting initiatives have been adopted. For example, Estonia has ensured a rate of access to the Internet of 90 per cent, including a broadly accessible online network of resources and services available to researchers, students and teachers.[39] India has promoted access for poor communities.[40] Other programmes include providing computers to children and students (Greece, Portugal, Uruguay), computer training for women, refugees and other forced migrants (Azerbaijan), extending telecommunication networks to reach remote ethnic minorities (Viet Nam) and adopting a list of universal services, including public fixed telephone networks enabling quality Internet access (Serbia).[41] Another noteworthy example, the Global Digital Solidarity Fund, launched by Senegal and supported by several States, aims at ensuring "affordable and fair access to the information technologies and their contents for everybody, especially marginalized groups" and promoting "such access as a basic right in both the public and private domains".[42]

38. The Special Rapporteur notes the initiatives of WIPO to increase the availability of scientific and technical information in developing countries, such as the Access to Research for Development and Innovation programme, and to support open access to scientific knowledge. In its response, WIPO suggests that "new models of communication and open access to educational resources and scientific literature, particularly via digital means, should be developed based on national and regional experiences." A priority in the WIPO Development Agenda "is to promote the role of IP rights in enhancing wider and more user-friendly distribution of content as a tool to promote innovation and scientific advancement as well as for reducing the "Digital Divide"".[43]

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[35] See www.unitaid.eu/.

[36] A/HRC/17/27.

[37] See E/C.12/Add.107, para. 63, and E/C.12/LYB/CO/2, para. 39.

[38] See *Towards Knowledge Societies*, UNESCO, 2005, p. 29, and Eric Rhodes, "Bridging the Digital Divide", Century Foundation, 2000.

[39] For example, the Tiger Leap programme (www.tiigrihype.ee).

[40] Gurumurthy, Singh and Kasinathan, "Pro-poor access to ICTs (see footnote 26). See also United Nations Development Programme, Human Development Report 2001: Making New Technologies Work for Human Development, 2001, p. 35, and http://ubislateway.com/.

[41] On measures promoting Internet access, see also the responses from Argentina, Cyprus, Germany, Guatemala and Peru.

[42] See www.dsf-fsn.org.

[43] In particular, Agenda recommendations 19, 24 and 27.

2. Freedom indispensable for scientific research and opportunities for all to contribute to the scientific enterprise

39. Freedom of scientific research means ensuring that the scientific enterprise remains free of political and other interference, while guaranteeing the highest standards of ethical safeguards by scientific professions.

40. Read in conjunction with the right to the freedoms of association, expression and information, scientific freedom encompasses the right to freely communicate research results to others, and to publish and publicize them without censorship and regardless of frontiers. The right of scientists to form and join professional associations as well as to collaborate with others in their own country and internationally, including the freedom to leave and re-enter their own country, must also be respected and protected. In addition, scientific freedom involves respecting the autonomy of higher education institutions and the freedom of faculty and students to, inter alia, express opinions about the institution or system in which they work, and to fulfil their functions without discrimination or fear of repression by the State or any other actor. [44]

41. The Venice Statement emphasizes that freedom of inquiry is vital for advancing knowledge on a specific subject, procuring data and testing hypotheses for some practical purpose, as well as for promoting further scientific and cultural activity. In the preamble to its recommendation on the status of scientific researchers, UNESCO called for measures enabling scientists to work in a spirit of intellectual freedom to pursue, expound and defend the scientific truth as they see it, and to help define the aims and objectives of the programmes they are engaged in and the methods adopted. It stressed the right of scientific researchers to "express themselves freely on the human, social or ecological value of certain projects and, in the last resort, withdraw from those projects if their conscience so dictates"; it also recommended strong whistle-blower protections.

42. Freedom of scientific research includes the right of everyone to participate in the scientific enterprise, without discrimination on the basis of race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status. Barriers to scientific research and opportunities for entering the science professions of certain sectors of society must be overcome. The Special Rapporteur also notes efforts to enhance popular participation in science, such as DIYbio, an online hub for sharing ideas and cost-effective methodologies and associated non-profit laboratories such as Genspace, and the Open Science Project, dedicated to writing and releasing free and open-source scientific software.[45] Evidence indicates that providing access to scientific know-how and facilitating experimentation by concerned populations can result in more cost-effective context-appropriate technological innovations.[46]

3. Participation of individuals and communities in decision-making

43. Reasons of the importance of the participation of individuals, communities and peoples in science-related decision-making include, in particular (a) the obligation to protect all persons, including marginalized populations, such as indigenous peoples, against the negative consequences of scientific testing or applications on, in particular, their food security, health or environment; and (b) the need to ensure that scientific research is conducted on key issues, including for the most vulnerable. Major decisions regarding

[44] E/C.12/1999/10, paras. 38-40.

[45] See www.DIYBio.org and www.openscience.org/blog/.

[46] See De Schutter, "The Right of Everyone to Enjoy the Benefits of Scientific Progress" (see footnote 19) and Appadurai (see footnote 12).

funding and research priorities, science policies, emerging areas of research, and new technological applications should entail a participatory process.

44. Some States have initiated public consultations on scientific advances. The Societal Dialogue on Nanotechnologies in the Netherlands, for example, catalysed the formulation of a public agenda, "Responsibly forward with nanotechnologies", that was submitted to the Government for its consideration.[47] In India, wide-ranging public consultations led the Government to impose a moratorium on Bt brinjal.[48] A number of countries use consensus conferences, citizens' dialogues or other consultative mechanisms[49] to elicit the views of the public.

4. An enabling environment for the conservation, development and diffusion of science

45. Under article 15, paragraph 2 of the International Covenant on Economic, Social and Cultural Rights, States undertake to take the steps necessary for the conservation, development and diffusion of science. These three interconnected aspects are essential.

46. Conservation requires the identification and safeguarding of scientific knowledge, products and tools, including literature, databases, specimens and equipment.

47. Development demands an explicit commitment to the development of science and technology for human benefit by, for example, developing national plans of action. Usually, this implies the adoption of programmes to support and strengthen publicly funded research, to develop partnerships with private enterprises and other actors, such as farmers in the context of food security, and to promote freedom of scientific research.

48. "Diffusion" encompasses the dissemination of scientific knowledge and applications both within the scientific community and in society at large, including through publishing research findings. As noted by UNESCO in the preamble to its recommendation on the status of scientific researchers, open communication of the results, hypotheses and opinions of research lie at the heart of the scientific process, and also provide the strongest guarantee of accuracy and objectivity of scientific results. The diffusion of science is a precondition for public participation in decision-making and essential for fostering further research, development and applications.[50]

C. The issue of limitations

49. The right to benefit from scientific progress and its applications, including scientific freedom, may be subjected to limitations, in accordance with relevant international standards. The Special Rapporteur recalls that such limitations must pursue a legitimate aim, be compatible with the nature of this right and be strictly necessary for the promotion of general welfare in a democratic society, in accordance with article 4 of the Covenant on Economic, Social and Cultural Rights. Any limitations must be proportionate: the least restrictive measures must be taken when several types of limitations may be imposed. Furthermore, existing international human rights standards on limitations that can or cannot be legitimately imposed on rights intrinsically linked to the right to science, such as the

[47] Wiebe E. Bijker, "The pubic and issues of science", *Hindu*, 10 February 2011. Available from www.thehindu.com/opinion/lead/article1200370.ece.

[48] Samir Nazareth, "Lessons from the Bt brinjal consultations", February 2010, Infochange. Available from http://infochangeindia.org/agriculture/analysis/lessons-from-the-bt-brinjal-consultations.html.

[49] Submissions by Canada, Costa Rica, Germany, Mauritius and Spain.

[50] Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications, para. 16(f).

rights to freedom of opinion and expression, to information and to association,[51] must be taken into consideration.

50. More specifically, the Declaration on the Use of Scientific and Technological Progress stresses the importance of ensuring that the results of scientific and technological developments are used for the purpose of human rights and freedoms in accordance with the Charter of the United Nations. Noting that scientific and technological developments can give rise to social problems, as well as threaten the human rights and fundamental freedoms of the individual, States are called upon to protect all strata of the population both socially and materially, from possible harmful effects of the misuse of scientific and technological developments".[52] In this regard, the Special Rapporteur stresses the importance of the precautionary principle: "in the absence of scientific consensus, caution and the avoidance of steps are required in case an action or policy might cause severe or irreversible harm to the public or the environment," and of the obligations of states to "monitor the potential harmful effects of science and technology, to effectively react to the findings and inform the public in a transparent way".[53]

51. Conducting research in a socially responsible manner in accordance with ethical standards is emphasized in article 14 of the Universal Declaration on the Human Genome and Human Rights. Rights and freedoms that may be most threatened by the conduct of scientific research, especially those involving exposure or contact and social science research eliciting personal data, are the rights to physical and intellectual integrity, liberty and security, to privacy, and to seek, receive and impart information.[54] The prohibition to submit a person to medical and scientific experimentation without his or her free consent must be specifically underlined.[55] States responses to the questionnaire describe various measures adopted to address these concerns.[56]

52. Marginalized populations with limited financial or political power and scientific awareness run a greater risk of violations as human research subjects.[57] In its general comment No. 20, the Human Rights Committee elucidated that special measures are needed to protect persons incapable of giving their consent and vulnerable populations, such as prison inmates. The Council of Europe Convention on Human Rights and Biomedicine also contains important provisions on the issue of consent.[58] Safeguarding the rights of research subjects must include benefit-sharing and providing remedies in the event of abuse. The UNESCO Universal Declaration on Human Rights and Bioethics and the development of National Bioethics Committees are examples of legal and institutional frameworks for the protection of research subjects.

53. One way to ensure the respect of ethical standards in scientific research is through codes of ethical standards developed and maintained by discipline-specific professional organizations. Currently, however, these codes are rarely based explicitly on human rights standards; for example, the codes of only 11 of the 261 organizations affiliated with the world's largest multidisciplinary scientific membership organization, the American Association for the Advancement of Science, refer to human rights. Several focus on

[51] E/C.12/GC/21, para. 19.
[52] See also Venice Statement, para. 24.
[53] Venice Statement, paras. 12 (f) and 16 (c).
[54] See for example the Declaration on the Use of Science, art. 6.
[55] International Covenant on Civil and Political Rights, art. 7.
[56] See in particular the responses of Canada, Germany, Mauritius and Spain.
[57] See for example "Ethically Impossible": STD Research in Guatemala from 1946 to 1948, Presidential Commission for the Study of Bioethical Issues, September 2011. Available from http://bioethics.gov/cms/sites/default/files/Ethically-Impossible_PCSBI.pdf.
[58] Chap. II.

scientists' rights; only a few provide standards for respecting human rights in the conduct of work. Developing codes of conduct explicitly informed by human rights thus seems essential.

54. Many States have taken measures to oversee research methods and the conduct of science in the public sector. The research practices of private institutions receive less scrutiny, however. This area requires greater attention, particularly when companies undertake research that would be illegal in one country but which, owing to a lack of legal protections, are possible in another. As stressed by the Committee on Economic, Social and Cultural Rights, States have an obligation to take steps to prevent human rights contraventions abroad by corporations which have their main office under their jurisdiction, without infringing the sovereignty or diminishing the obligations of the host States. [59]

55. The Special Rapporteur also received information that assessments made pursuant to certain agreed international standards "are insufficient to determine the hazard(s) of certain chemicals", and "have been criticized by civil society as an inadequate reflection of scientific progress in detecting the hazards of chemicals". It has been further argued that the reluctance of regulators to use general peer-reviewed and published scientific evidence of chemicals hazard(s) may "impede the application of the benefits of scientific progress by effectively limiting access to relevant information in decision-making processes".[60] This requires further attention.

IV. Areas for further consideration

A. The right to science and intellectual property rights

56. Concern has been widely expressed about the conflict between the right to science and intellectual property rights, in particular since the adoption of the WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS).[61] Bilateral and/or regional trade and investment agreements containing "TRIPS plus" provisions or restricting TRIPS flexibilities can also pose problems.[62] The potential of intellectual property regimes to obstruct new technological solutions to critical human problems such as food, water, health, chemical safety, energy and climate change requires attention.[63]

57. The rights of authors protected by human rights instruments are not to be equated with "intellectual property rights"; both intellectual property rights and authors' rights may,

[59] E/C.12/2011/1. See also the Guiding Principles for Business and Human Rights (A/HRC/17/31), annex.

[60] Submission by CIEL. See also the reports of the Special Rapporteur on the human rights obligations related to environmentally source management and disposal of hazardous substances and waste, for example E/CN.4/2006/42.

[61] In particular, see resolution 2000/7 of the Subcommission on the Promotion and Protection of Human Rights, preamble. See also A/HRC/11/12 and A/HRC/17/43, para. 6.

[62] A/HRC/11/12, para. 68. See Thomas Faunce, "Innovation and Insufficient Evidence: The Case for a WTO Agreement on Health Technology Safety and Cost-Effectiveness Evaluation", in *Incentives for Global Health: Patent Law and Access to Essential Medicines*, Kim Rubenstein, Thomas Pogge and Matthew Rimmer (eds), Cambridge University Press, 2010, pp. 209-232.

[63] T. Faunce, "Will International Trade Law Promote or Inhibit Global Artificial Photosynthesis?", *Asian Journal of WTO and International Health Law and Policy*, Vol. 6, , pp. 313-347. See also submission by CIEL and "Technology Transfer In the UNFCCC and Other International Legal Regimes: the Challenge of Systemic Integration", International Council on Human Rights Policy, 2010. Available from www.ichrp.org/files/papers/184/138_technology_transfer_UNFCCC.pdf.

if necessary, be limited to uphold other rights.[64] The intellectual property regime is a temporary monopoly that "should be managed in accordance with a common responsibility to prevent the unacceptable prioritization of profit for some over benefit for all".[65]

58. In its response to the questionnaire, WIPO stated that, "in order for the international patent system to continue to serve its fundamental purpose of encouraging innovation and promoting dissemination and transfer of technology, the right balance should be struck between the rights of technology holders and the rights of technology users for the benefit of society as a whole." A number of exceptions and flexibilities in treaties, such as the Paris Convention for the Protection of Industrial Property and the International Convention for the Protection of Literary and Artistic Works, may be used to ensure compatibility with, in particular, the right to science. A wide range of policy space given to States, "asymmetries", allow "different standards of IP protection provided the principles and substantive provisions are fulfilled". The TRIPS Agreement reduced this policy space although it, too, incorporates some "flexibilities".[66]

59. These flexibilities are important tools to ensure respect for human rights; they need to be explored further and applied more consistently. The Special Rapporteur recalls, however, that "a number of developing countries, while attempting to implement TRIPS flexibilities to address public health concerns, have experienced pressures from developed countries and multinational pharmaceutical corporations".[67] Similar concerns have been expressed in other fields.[68] She also notes that, in accordance with intellectual property treaties, States must establish "minimum standards of protection", and that surpassing these may not always be compatible with human rights standards. Furthermore, it is pertinent to assess whether existing minimum standards accord with human rights standards.

60. The relationship between intellectual property regimes and human rights has been most comprehensively addressed in the context of health,[69] although it is now receiving more attention in the contexts of the right to food and of climate change.

61. The Special Rapporteur notes that new incentives have been proposed to ensure innovation and access to medicines at affordable costs, in particular for those living in extreme poverty. Importantly, the WTO Doha Declaration on the TRIPS Agreement and public health explicitly recognizes that the TRIPS Agreement "can and should be interpreted and implemented in a manner supportive of WTO Members' right to protect public health", and reaffirmed the right to use the flexibilities included in the Agreement for this purpose. Generic competition has emerged as a most effective strategy, for example allowing a reduction of up to 99 per cent in the cost of drugs.[70] Interesting case law is also developing on this issue. In 2008, for example, in India, the High Court of Delhi dismissed a case brought by a multinational pharmaceutical company claiming that the generic manufacturing of a lung cancer drug infringed on its patent rights. The ruling was based, in part, on the court finding that upholding the multinational's patent rights would violate the right to life of those without access to its drugs.

62. Incentives can be provided through "patent pools" that enable several patent holders to license their patents to third parties. This increases access by reducing the time in which drugs become available, lowers drug costs by promoting collaboration rather than

[64] E/C.12/GC/17, paras. 3-4.
[65] Venice Statement, para. 10.
[66] See also A/HRC/11/12.
[67] A/HRC/17/43, para. 47.
[68] See De Schutter (see footnote 19) and submission by CIEL.
[69] A/HRC/11/12.
[70] See A/HRC/11/12, para. 20.

competition, and facilitates new drug combinations for simpler treatment. The UNITAID Medicines Patent Pool, for example, encourages new generic formulations by facilitating patent-sharing and streamlining the production of new medicines in currently underresearched areas. A new royalty-free license for patents on the HIV/AIDS antiretroviral drug Darunavir introduced by the United States National Institutes of Health led to Gilead Science licensing its patents on several drugs to the Patent Pool.

63. In the field of agricultural biotechnology, initiatives include the multi-country Public Intellectual Property Resource for Agriculture, in which more than 40 public institutions seek to lower barriers created by intellectual property regimes and to facilitate technology transfer. Research is also encouraged by such open-source experiments as the Biological Open Source (BiOS) License, which offers researchers free access to key technologies provided that they share any improvements made to these tools under the BiOS open source license regime.[71]

64. A separate, often raised concern relates to the threat posed by "bioprospecting" for traditional knowledge of indigenous peoples and other local communities. In response, many States are developing databases for the documentation and conservation of traditional knowledge. Interesting models for protecting traditional knowledge from misappropriation include the India Traditional Knowledge Digital Library (www.tkdl.res.in/tkdl/langdefault/common/), which provides national patent offices with access to 223,000 indigenous medicinal formulations. As a result, at least two patents have been withdrawn and more than 75 applications withdrawn, rejected or amended. Some States, such as, Brazil, Guatemala, Peru and Portugal, have taken measures to give legal protection to the rights of indigenous peoples and local communities to their accumulated scientific knowledge. Further discussion is needed, however, on the modalities and conditions under which others should benefit from such accumulated knowledge, and how to allow further development and dissemination of such knowledge while safeguarding the moral and material interests of the individual or collective creators. Agrobiodiversity, maintained and transmitted as a common public good by local farmers, also needs to be addressed.[72] WIPO is currently conducting "text-based negotiations" with a view to reaching an agreement on an international legal instrument(s) which "will ensure the effective protection of genetic resources, traditional knowledge and traditional cultural expressions".[73]

65. The Special Rapporteur points out that legal scholars have increasingly questioned the economic effectiveness of intellectual property regimes in promoting scientific and cultural innovation. Scholars have found no evidence to support the assumption that scientific creativity is only galvanized by legal protection or that the short-term costs of limiting dissemination are lower than the long-term gain of additional incentives. Consequently, the Special Rapporteur proposes the adoption of a public good approach to knowledge innovation and diffusion, and suggests reconsidering the current maximalist intellectual property approach to explore the virtues of a minimalist approach to IP protection.[74] Recalibrating intellectual property norms that may present a barrier to the right

[71] De Schutter (see footnote 19).

[72] De Schutter, op. cit.

[73] WIPO submission, p. 17.

[74] See in particular Shaver, "The right to science and culture" (see footnote 6), pp. 128 and 159-160; Yochai Benkler, *The Wealth of Networks: How Social Production Transforms Market and Freedoms*, New Haven and London, Yale University Press, 2006, p. 36; James Boyle, *The Public Domain: Enclosing the Commons of the Mind*, Yale University Press, 2008, and Joseph E. Stiglitz, "Knowledge as a global public good", in *Global Public Goods: International Cooperation in the 21st Century*, Inge Kaul et al. eds., UNDP, New York, Oxford University Press, 1999, pp. 308–09.

to science and establishing greater coherence among them seem to be necessary steps. The Special Rapporteur stresses the need to guard against promoting the privatization of knowledge to an extent that deprives individuals of opportunities to take part in cultural life and to enjoy the fruits of scientific progress, which would also impoverish society as whole.

B. Equitable sharing of benefits and transfer of technologies

66. The need to promote everyone's access to science and its applications raises the issue of the sharing of benefits and the transfer of scientific knowledge and technologies.

67. Two declarations made by UNESCO that address the issue in the field of biomedical research, its conduct, outcomes and applications are a useful starting point. The Universal Declaration on Bioethics and Human Rights states that "benefits resulting from any scientific research and its applications should be shared with society as a whole and within the international community, in particular with developing countries". In article 15, it recognizes multiple forms of benefit-sharing, including "special and sustainable assistance to, and acknowledgement of, the persons and groups that have taken part in the research; access to quality health care; provision of new diagnostic and therapeutic modalities or products stemming from research; support for health services; access to scientific and technological knowledge; and capacity-building facilities for research purposes". The International Declaration on Human Genetic Data, in its article 19, addresses benefit-sharing in almost identical terms. Important provisions may also be found in part IV of the International Treaty on Plant Genetic Resources for Food and Agriculture.[75] Numerous United Nations documents, including some relating to the environment, biological diversity and climate change, emphasize the need to strengthen international cooperation in the area of science, develop the scientific and technological capacity of developing countries, ensure the international dissemination of scientific knowledge and research, particularly among industrialized and developing countries, and call for transfers of technologies, practices and procedures.[76] A number of regional texts (see paragraphs 9 – 12 above), should also be recalled.

68. The implied obligation for developing countries is the prioritization of the development, importation and dissemination of simple and inexpensive technologies that can improve the life of marginalized populations, rather than innovations that disproportionately favour educated and economically affluent individuals and regions.[77] The corresponding obligation for industrialized States is to comply with their international legal obligations through the provision of direct aid, financial and material, as well as the development of international collaborative models of research and development for the benefit of developing countries and their populations.

[75] Part IV. See De Schutter (see footnote 19).

[76] See in particular the Charter of Economic Rights and Duties of States, art. 13 (1); the Declaration on the Use of Scientific and Technological Progress in the Interests of Peace and for the Benefit of Mankind, art. 1 and sect. 5; the Universal Declaration on the Human Genome and Human Rights, art. 18; the Framework Convention on Climate Change, art. 4(1)(c); Principle 9 of the Rio Declaration on Environment and Development; the Convention on Biological Diversity, art. 12 (a), preamble, art. 1 + art. 16 (2); General Assembly resolution 65/1, , para. 78 (*u*); and the Declaration of Principles of the World Summit on the Information Society. See also International Council on Human Rights Policy, *Climate Change and Human Rights: A Rough Guide*, Geneva, 2008, p. 14; Audrey R. Chapman, "Towards an understanding of the right to enjoy the benefits of scientific progress and its applications", *Journal of Human Rights*, Vol. 8, No., January 2009, pp. 1-36.

[77] Chapman, "Towards an Understanding of the Right to Enjoy the Benefits of Scientific Progress and Its Applications" (see footnote 77), p. 14.

69. The Special Rapporteur takes note of the WIPO programmes on capacity-building and technical assistance in the area of technology transfer.[78]

C. Third-party actors and their obligations

70. The diminishing role played by the State in research and development and the concomitant extensive increase in the involvement of the private sector are reducing the ability of Governments to identify priority research areas, conduct research and disseminate resultant products.

71. The Special Rapporteur believes that, in the area of science, States should not rely entirely on the private sector; they should make all efforts possible to ensure publicly funded research, enter into partnerships with the private sector, and ensure that private companies respect human rights. This includes setting out clearly "the expectation that all business enterprises domiciled in their territory and/or jurisdiction respect human rights throughout their operations", including abroad. [79]

72. Initiatives to influence the actions of private companies for better realization of the right to science include "socially responsible" or "humanitarian" licensing, which ensures that the licensing of intellectual assets, often developed by Government-funded research at universities, is negotiated and transacted in a manner conducive to providing broad affordable access to disadvantaged sections of society, particularly in developing countries. It also makes proprietary research tools widely available for the advancement of knowledge and has been applied to innovations in, for example, medicine, agriculture and diagnostic tools. Strategies include issuing non-exclusive licenses, allowing licensors to license a product for humanitarian and commercial purposes simultaneously; licensing to a public-private partnership to develop a product that may, for example, benefit a neglected market; and conditional licensing, which requires social responsibility on the part of the licensee, for example, to sell a product at a reduced price to poor markets. Such licensing does not affect business transactions in developed countries where significant profits can still be achieved while ensuring access for least developed countries.

73. Examples from the United States of America include the Food and Drug Administration Act, which rewarded the development of a new tropical disease medication by issuing a transferable voucher that entitles the bearer to a priority review for any other drug it submits for market approval in the United States, and Yale University, which renegotiated its license agreement with Bristol-Myers Squibb to allow generic production in South Africa at a price reduced by thirty-fold .[80]

V. Recommendations

74. **The Special Rapporteur recommends that:**

(a) States ensure that innovations essential for a life with dignity reach everyone and identify the priority needs of marginalized populations, including

[78] WIPO submission, pp. 14-16.

[79] Principle 2 of the Guiding Principles on Business and Human Rights (A/HRC/17/31), annex. See also E/C.12/2011/1, para. 5.

[80] Amanda L. Brewster, Audrey R. Chapman and Stephen A. Hansen, "Facilitating Humanitarian Access to Pharmaceutical and Agricultural Innovation", *Innovation Strategy Today*, Vol. 1, No. 3, 2005.

through consultative processes, direct funding and the facilitation of targeted research by public and private sector institutions;

(b) Private sector organizations examine ways of contributing to the realization of the right to science as part of their commitment to corporate social responsibility;

(c) States ensure freedom of access to the Internet, promote open access to scientific knowledge and information on the Internet, and take measures to enhance access to computers and Internet connectivity, including by appropriate Internet governance that supports the right of everyone to have access to and use information and communication technologies in self-determined and empowering ways;

(d) Universities, research and funding institutions adopt mandatory open-access policies for journals and repositories of research;

(e) States consider establishing universal services, including electricity, telephone and computer / Internet connections, to ensure access of all to these essential technologies;

(f) States fully respect, protect and promote scientific freedom, encompassing academic freedoms, the right to freely publicize results regardless of frontiers, the right of scientists to form and join professional associations and to collaborate with others in their own country and internationally, including the freedom to leave and re-enter their own country;

(g) States promote science education at all levels and integrate human rights components into all science education, including training and continuing education programmes;

(h) States ensure the participation of individuals, communities and peoples in decision-making relating to science in order to (i) provide opportunities for all to make informed decisions after considering both the possible improvements and potentially harmful side effects or dangerous usages of scientific advances; (ii) protect marginalized populations against the negative consequences of scientific testing or applications on, in particular, their health, food security or environment; (iii) ensure that scientific research is conducted on key issues for specific countries and communities, including the most vulnerable;

(i) States and other stakeholders raise awareness about the meaning and significance of the right to science among researchers, research institutions, professional organizations, the private sector and the general public;

(j) States take the steps necessary for the conservation, development and diffusion of science, including programmes to strengthen publicly funded research; partnerships with private enterprises and other actors, including, wherever possible, relevant communities; and the dissemination of scientific knowledge and applications both within the scientific community and society at large;

(k) States promote the transfer of technologies, practices and procedures to ensure the well-being of people. Developing countries should prioritize the development, importation and dissemination of simple and inexpensive technologies that can improve the life of marginalized populations. Industrialized States should comply with their international legal obligations by means of direct aid and the development of international collaborative models of research and development;

(l) States and other stakeholders further develop incentive mechanisms that delink research and development from the price of products and encourage companies to join the Medicines Patent Pool;

(m) States protect all individuals against any harmful effects of the misuse of scientific and technological developments while ensuring that limitations to the right to benefit from scientific progress and its applications, including scientific freedom, are in conformity with international standards;

(n) The research practices of public and private institutions alike respect ethical standards and human rights, including when research is conducted abroad. Scientific and engineering organizations and research facilities should adopt ethical standards explicitly based on human rights;

(o) States guard against promoting the privatization of knowledge to an extent that deprives individuals of opportunities to take part in cultural life and enjoy the fruits of scientific progress, and consequently to reconsider the current maximalist intellectual property approach and explore the virtues of a minimalist approach to intellectual property protection. States should also further develop and promote creative mechanisms for protecting the financial interests of creators and the human rights of individuals and communities;

(p) States request legislative and policy advice from WIPO, including on how to use TRIPS flexibilities to accommodate particular national interests and development needs;

(q) States implement the recommendations of the Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health and the Special Rapporteur on the right to food on the issue of intellectual property rights.[81]

75. **The Special Rapporteur also recommends that:**

(a) A participatory process be adopted to further enhance the conceptual clarity of the right to science and related obligations, involving United Nations human rights mechanisms, in particular relevant special procedures of the Human Rights Council, relevant intergovernmental organizations, States, the private sector and civil society, including through a day of general discussion on the topic by the Committee on Economic, Social and Cultural Rights and the organization of non-official meetings;

(b) The Committee on Economic, Social and Cultural Rights review article 15 of the Covenant in a comprehensive manner, and envisage adopting a new general comment encompassing all rights recognized therein;

(c) National mapping of existing practices be undertaken, possibly under the collaborative leadership of UNESCO and WIPO. In particular, compilations of good practices should be elaborated on:

(i) Measures to promote access to scientific benefits, including access to scientific knowledge;

(ii) International cooperation and transfer of technologies;

(iii) Measures to respect, protect and promote scientific freedom;

(iv) Human rights safeguards in the conduct and application of scientific research;

[81] See A/HRC/11/12, AHRC/17/43 and A/64/170.

(v) Protecting both the moral and material interests of creators, and the human rights of individuals and communities to have access to those creations;

(vi) The participation of people in decision-making relating to scientific matters.

(d) The Human Rights Council request OHCHR to facilitate, involving relevant human rights mechanisms and United Nations entities, a process to establish guidelines on human rights impact assessments of new scientific research and applications, appropriate measures for determining whether and how potentially harmful research should proceed, and monitoring processes that should be established.

Annex I

Responses to the questionnaire on the right to enjoy the benefits of scientific progress and its applications

States Members of the United Nations

Argentina
Azerbaijan
Bosnia and Herzegovina
Brazil
Canada
Costa Rica
Cyprus
Estonia
Georgia
Germany
Greece
Guatemala
Japan
Mauritius
Portugal
Uruguay
Peru
Serbia
Slovakia
Spain
Uzbekistan
Viet Nam

United Nations agencies

1. World Intellectual Property Organization

Other stakeholders

1. American Association for the Advancement of Science
2. Association Prudence au Sahel
3. Judith Blau, Professor
4. Center for International Environmental Law
5. EIFL – Knowledge without boundaries
6. Foundation for Gaia
7. German Commission for UNESCO
8. Ipas
9. International Federation of Library associations and institutions
10. Observatoire de la diversité et des droits culturels
11. Aurora Plomer, University of Sheffield
12. United Nations Educational, Scientific and Cultural Organization Extea

Annex II

Participants in the experts' meeting on the right to enjoy the benefits of scientific progress and its applications (Geneva, 5-6 December 2011)

Pamela Andanda	Ethics, Law and Human Rights Working Group of the African AIDS Vaccine Programme, South Africa
Audrey Chapman	University of Connecticut School of Medicine, United States of America
Thomas Faunce	College of Medicine, Biology and the Environment and College of Law, Australian National University
Lynn P. Freedman	Columbia University's Mailman School of Public Health, United States of America.
Parminder Jeet Singh	IT for Change, India
Vijay Nagaraj	International Council on Human Rights Policy, Switzerland.
Helena Maria Nygren Krug	World Health Organization
Roger Pfister	Swiss Academy of Sciences and International Council for Science
Eibe Riedel	Committee on Economic, Social and Cultural Rights
Xavier Seuba	Universitat Pompeu Fabra, Barcelona, Spain
Marisol Iglesias Vega	World Intellectual Property Organization
Marco Aleman	World Intellectual Property Organization
Konstantinos Tararas	United Nations Educational, Scientific and Cultural Organization
Jans Karklins	United Nations Educational, Scientific and Cultural Organization
Jessica Wyndham	American Association for the Advancement of Science, United States of America