

Advanced unedited version



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8. Cultural diversity has an important—yet often underestimated—role to play in tackling current ecological challenges. Culturally

innovation”—actors draw on multiple sources of knowledge, incorporating concepts from disparate disciplines to find innovative solutions to problems. In turn, this spurs robust development of knowledge-based societies in which innovative products and services are developed.

15. Studies suggest that, because knowledge is becoming more widely distributed, innovation increasingly needs to occur ‘at the interstices’ of collaborating groups and organizations, making networks important means for developing countries to exchange knowledge and advance their economic development. By working through an integrated and networked approach, multilateral stakeholders, national and local governments as well as private entities are better equipped to approach development processes in a more effective, inclusive and transparent way. Thus, **networked innovation processes have advantages over more hierarchical forms of collaboration, including collectively managing the benefits and risks that accompany innovation processes.**

16. Web-based technologies have also made new forms of science and technology collaboration possible. In particular, **free and open-source collaborations and solutions**

mechanisms, and creating education and training programmes for those who will generate or commercialize the new products and services.

20. Innovation is rapidly changing in the manner in which it is carried out and where it occurs. Recent years have seen a significant shift in the geography of innovation with a new dynamic emerging. In particular, firms in middle-income countries – especially in East Asia – have seen a marked increase in their share of global research and development (R&D) spending. Data on the top 1,000 global R&D spenders confirm that a number of multinationals from middle-income economies now conduct substantial R&D, on par with multinationals of high-income countries.

21. However, persistent technological and innovation divides between countries and regions continue. The most important innovation gaps are between countries at different stages of development. On average, high-income countries outpace countries with lower per capita income by a wide margin in all innovation performance metrics. Around 70 per cent of R&D spending worldwide still takes place in high-income countries. Although middle- and low-income developing economies have increased their share of global R&D expenditure and patent applications, most of this increase is accounted for by East Asia. Gains have been more modest in other developing countries.

Internationalization of R&D

22. During the last two decades, research, development and demonstration (RD&D) stocks and flows have changed, illustrating a growing role for developing countries with technology-intensive policies and industries. Moreover, globalization and the connectivity and information provided by the Internet have influenced the way in which research is conducted and enhanced the speed with which collaboration can result in innovation.

23. Both public and private sectors are internationalizing their efforts in order to access and make use of globally dispersed knowledge, as well as connect with important innovation hubs in new markets. This approach involves universities and other research institutions attempting to attract and retain the best talent. Private companies also seek the most suitable innovation environment in which to locate or secure skilled personnel, supportive business conditions and market access. Governments can **support such endeavours by linking national research and innovation systems, institutions and actors to global knowledge and innovation hubs**. Creativity will be required to effectively **engage universities, science parks and higher education institutions in monitoring and designing solutions that address local development priorities**.

24. Strengthening research, development, and innovation can promote economic growth and competitiveness, but **one of the principal challenges is ensuring that the results of R&D infrastructure used by commercial entities for knowledge creation and innovation are directed toward sustainable development**. **Emphasis must also be put on the creation of centres of excellence in various disciplines, linked to key national and regional sectors that** can, in turn, participate in technology transfer among

innovative, medium-sized firms. In some developing countries, the major concern is establishing an innovation cycle suitable to the cultural context, with the option of shortening it to facilitate the smooth transition of knowledge to enterprise, with access to the research efforts of larger commercial entities.

25. Additionally, promoting the commercialization of R&D activity could result in the application of intellectual property rights to support new technology-oriented firms, rather than allowing open access to information and methodologies. One positive effect is that internationalization of R&D is associated with increased investment in high quality infrastructure for research and development, particularly at higher education institutions, which benefit students and also attract professional workers in research and development, contributing to building human capital.

Increased openness, transparency and participation in STI

26. Over the past decade, ICT innovation, in particular, has helped to foster a nascent open government movement based on transparency, accountability and participation. This has resulted in a wave of national freedom of information and data protection laws in many countries. The evolution of the Internet, including mobile and social networking technologies, has engendered more efficient, effective and responsive systems of public administration.

27. A recent trend in this area is the provision of open data by national and local governments. The push for open government data has arisen from the efforts of citizens seeking enhanced accountability and transparency through disclosure of data produced or collected by public institutions. While this development is grounded in a vision of more honest and effective government, the economic value of releasing public information assets for research and commercial use is increasingly becoming evident.

28. These initiatives, which often draw on and merge data sources from governments, NGOs and private sector firms, have the potential to open up the entire process of innovation to a wide array of collaborators on stages ranging from the initial setting of research priorities to service delivery. **More participatory approaches to the design and implementation of sustainable development policies can foster greater inclusion and buy-in**, and more effective agreement on the pursuit of sustainability goals. **Incorporating excluded groups – especially women and girls, youth, older persons, persons with disabilities and indigenous peoples – is especially important.** This broadens the range of contributors to setting priorities and enhances the potential for success. These approaches, which in their most inclusive forms represent knowledge co-creation between scientific and local knowledge-holders, have proven to be powerful means of generating solutions to many problems.

sources such as solar, wind, hydropower or biofuels – have become more available. These energy options offer rural populations and other underserved communities new opportunities for accessing energy where conventional approaches have failed. Such options can create jobs if bridges are built between complementary energy and employment policies. **Smart partnerships between the public and private sectors need to be leveraged so that clean and affordable energy is available even in the most remote areas**, where business risk curtails the engagement of the private sector. **Political leadership, appropriate priorities and long-term policies, coupled with a massive up-scaling of programmes are also needed to enhance opportunities for investment.**

Access to freshwater

48. The world recently celebrated the achievement of one of the targets for MDG-7 – halving the proportion of people worldwide without sustainable access to safe drinking

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IV.

60. The income produced by cultural industries globally in 2007 was estimated at US\$1.6 trillion. This points to a real opportunity for developing countries, especially since creative and cultural industries can be promoted with limited capital investment and have low entry barriers. Benefits flowing from this could stimulate trade and markets, contributing to debt alleviation and employment. For instance, cultural tourism accounts for 40 per cent of global tourism-related revenues and is one of the fastest-growing economic sectors, especially in developing countries. Cultural tourism accelerates investment in culture and creativity, revitalising local economies, and contributing to the preservation of diverse forms of heritage.

61. However, in many cases, creative and cultural sectors are characterized by self-employed artisans and small businesses, including women and other disadvantaged people who tend to remain in the informal economy. These groups need support in capacity building, especially in linking to national and global markets.

62. Creative industries flourish where there is an appropriate regulatory framework and broad respect for culture and creative work within society. Intellectual property rights, guaranteeing the return of value to creators and enabling widespread access to content by the public, are fundamental to this framework. Such rights also generate income and employment, often with a direct impact on disadvantaged groups. Existing

Culture and gender equality

65. The creative and cultural sectors provide opportunities for women to increase their capabilities and for employment and entrepreneurship. For instance, the participation of women in the crafts sector has been shown to strengthen women's economic opportunities, and improve their role in h

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developed for strengthening their capacities to access and absorb technological changes.

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innovation by subsidizing interest rates, providing guarantees to act as collateral or simply by supplying grants to be used as seed funding. Furthermore, policy should encourage and support the development of private forms of funding such as venture capital or business “angels”, which are particularly suited to this style of funding and mentorship.

86. Another way to boost the attractiveness of innovation investment and improve the prospects for STI is through strengthening the role of the Intellectual Property Regime (IPR). The innovation process involves a range of risky research activities that eventually generate information with public good characteristics. Unless individual firms can profit from this information, they will not undertake the necessary investments. **Through the IPR, governments can provide the incentives for firms and individuals to undertake creative and innovative activity by enabling them to obtain exclusive ownership of their findings for a period of time.** In industry, patent and utility models protect inventions with industrial application, industrial designs protect novel designs, trade secrets protect confidential business information and trademarks protect the source of a good of one party from those of other parties.

87. The extent of protection and enforcement of intellectual property rights varied widely among countries around the world. The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) in the WTO attempts to narrow the gaps in the way these rights are protected within countries, and to bring them under common international rules. It establishes minimum standards for many forms of domestic intellectual property protection, such as copyright, patents, trademarks. Importantly, the Agreement includes several “flexibilities” that can be used by developing countries in designing their own IPR system. In turn, the Agreement on Trade Related Investment Measures (TRIMs) are rules that restrict preference of domestic firms and thereby enable international firms to operate more easily within foreign markets, by prohibiting practices such as local content requirements, manufacturing requirements, and technology transfer requirements. Both agreements have considerable implications for permissible STI policies at the national level. There have been calls for a dialogue on IPRs and the possible evolution of their focus from protection of innovation to one that fosters its dissemination.

88. In the WTO, within the Council for TRIPS and the Working Group on Transfer of Technology, there is also an on going debate over technology transfer and the patent system. It relates to implementation of article 66.2 of the Agreement, which requires developed countries to provide incentives to entities located in their territories in order to promote and encourage the transfer of technology to the least developed countries. Current debates about technology transfer and the environment therefore raise the question of whether this amounts to another intellectual property and technology transfer debate, or whether environmentally sound technologies present distinctive challenges.

3.

94. **Developing countries should be supported in their efforts to strengthen trade policy and national capacity development in order to expand the growing contribution of creative industries to international trade.** This support could take the form of improved linkages with global and regional value chains, given the payoffs likely to occur for economic diversification and poverty alleviation and for participation in global innovation. Aid-for-Trade regimes should recognise this need and act upon it, paying particular attention to women entrepreneurs and small and medium enterprises.

95. Moreover, **Governments should implement national development strategies aimed at harnessing the potential of cultural industries for sustainable development through adequate regulation, facilitation of access to global and regional value chains and capacity-building,** placing a particular emphasis on women entrepreneurs, marginalised groups and small and medium-size enterprises.

C. International levels

96. Governments are increasingly pursuing regional STI policies, which simultaneously support national and global actions. In particular, there are a number of regional agreements that specifically encourage scientific collaboration and the development and transfer of technology. These often include general provisions stressing cooperation in areas relevant to the development, transfer and adaptation of technology within a region, and specialized provisions establishing regional multinational enterprises. There are STI centres of excellences throughout the world, even in those regions that lag behind others on STI capacities.

2. STI ecosystems

104. Technology progresses along a life cycle from research to development; from demonstration to market formation and diffusion. Science is a necessary input for each of these stages. In the long run, there cannot be progress in technology without progress in science, and vice versa. Similarly, science and technology a

or codified in blueprints, designs technical documents and the contents of training programmes. It encourages learning and innovation through design and engineering knowledge. Benefitting from this, however, is not straightforward; it is part of a learning process involving continuous exchanges between suppliers and receivers of technology and other stakeholders. Mastering a technology requires significant effort and time. **Technologies need to be adapted to local conditions and necessitate the**

areas for further work, and conduct analysis to inform high-level policy discussions.

126. In “The Future We Want” world leaders recognized that inter- and intra-disciplinary sharing of knowledge is essential to create the individual and organizational capacity necessary for achieving an integrated approach to sustainable development. **The Council could consider developing further its system of**

10. **Supporting the elaboration of relevant goals, targets and monitoring systems to mainstream STI in development**, in the context of the post-2015 framework.
11. **Strengthening international cooperation to promote the role of cultural heritage, equitable cultural tourism, as well as cultural and creative industries, as key resources to address the three dimensions of sustainable development.**
12. **Facilitating the exchange of knowledge and assessing the impact of culture on development, particularly regarding social inclusion, human rights and sustainability.**