

**UNESCO contribution to the Report of the UN Secretary-General on
“Science, technology and innovation, and the potential of culture, for promoting sustainable
development and achieving the Millennium Development Goals”
for the 2013 ECOSOC Annual Ministerial Review¹**

I. Introduction

The international community has agreed that the development approach followed so far, despite the progress made, has exposed its limits. As noted in the Outcome Document of the United Nations Conference Rio+ 20 on Sustainable Development “The Future We Want for All”, a transformative change is required and “business as usual is no longer an option”².

As part of the on-going efforts to redefine the paradigm of development and human wellbeing, the role and potential of culture in addition to a culture-sensitive approach have drawn increasing attention. This echoes the need for addressing development in ways that go beyond a mere reference to GDP in the pursuit of achieving a more equitable and sustainable world as well as a more fulfilled existence.

Culture³ and science constitute an essential nexus for innovation and peace. A “culture of sustainability”, in our practice and mind, is indeed nurtured by a mutually reinforcing partnership between science and culture. Innovation, brought about by a combined result of a novel idea, necessity and technological opportunity, is an arena where culture, science and technology collaborate in unexpected ways, for instance to design solutions to mitigate development pressures, as demonstrated by the examples featured in the “Design with the other 90%” exhibition from developing countries⁴.

A culture of peace is a prerequisite to an ethical, universal process of the scientific progress as the production, sharing and application of scientific knowledge are reinforced through education, policy and a variety of forms of cooperation at local, national and international levels where there should be no barrier between different races, genders, nationalities, religions and political beliefs. On the other hand, integrated approaches in managing global issues such as climate change, environmental challenges and the mitigation of disaster risks require synergies between socio-culturally relevant approaches notably in taking into account local and indigenous practices, deeply rooted in a given community’s value system, and the state of the art, contemporary scientific knowledge.

¹ This text reflects UNESCO’s contribution to the Report of the UN Secretary-General “*Science, technology and innovation, and the potential of culture, for promoting sustainable development and achieving the Millennium Development Goals*” for the 2013 ECOSOC Annual Ministerial Review. It has been elaborated in conjunction with inputs from other UN contributing agencies and therefore may also reflect views and inputs provided by other contributors to the Report.

² “Realising the Future We Want for All- Report to the Secretary-General”, the Outcome Document of the Rio+20 Conference, June 2012, accessible online at http://www.un.org/millenniumgoals/pdf/Post_2015_UNTTreport.pdf

³ The UNESCO Universal Declaration on Cultural Diversity (2 November 2001) defines the culture: “*Reaffirming* that culture should be regarded as the set of distinctive spiritual, material, intellectual and emotional features of society or a social group, and that it encompasses, in addition to art and literature, lifestyles, ways of living together, value systems, traditions and beliefs”. This definition is in line with the conclusions of the World Conference on Cultural Policies (MONDIACULT, Mexico City, 1982), of the World Commission on Culture and Development (*Our Creative Diversity*, 1995), and of the Intergovernmental Conference on Cultural Policies for Development (Stockholm, 1998).

⁴ Design with the Other 90%: CITIES, led by the Smithsonian Institution, supported by the Rockefeller Foundation, the exhibition showed projects of locally adapted design solutions to many of the fast-growing cities of developing countries.

Despite these significant recognitions in culture's substantive contribution to sustainable development, an agreed and comprehensive policy to inform all development strategies and programmes at global, regional and local levels, which would integrate a culture-sensitive perspective within its goals, indicators and targets, is still missing. Without such a policy, and the related guidance, the potential of culture to contribute to sustainable development is likely to remain largely untapped in many regions of the world.

II. The nexus between science, technology and innovation (STI), and culture, the MDGs and sustainable development

Science, technology and innovation (STI) are important drivers of sustainable development and can provide alternative and more sustainable solutions to development challenges such as *inter alia* access to clean water, clean energy, food and health care. STI is also an engine of social transformation encouraging communication between groups including youth and providing the opportunity for partnerships and the strengthening of the social fabric of society. However, STI coupled with increase in natural resource consumption has contributed to biophysical and societal changes with often negative impacts for human well-being.

The relationship between science and culture has multiple dimensions; science necessitates a culture of enquiry, and culture contextualizes science. Science has the ability change culture by using scientific discoveries to inform and change ways of life. How societies support STI development, address STI development in an integrated manner across regions to address local and global issues, and how STI transforms societies are all anchored in culture. The multiple dimensions of the nexus between STI and culture must be addressed so that society sees the acquisition of knowledge as an important cultural value that scientific and technological advances can help address sustainable development issues across scales, and can fully contribute to the change of behaviour and social transformations required to attain sustainable development.

A. Science, technology, innovation and capacity-building for sustainable development

For STI to assume its pivotal role in sustainable development, policies and programmes must be put in place that promote knowledge production, dissemination and utilization as well as the development and appropriation of technologies that spur innovation both at large production facilities and at grassroots level in small and medium enterprises (SMEs). The promotion of a culture of science, capacity building and education in STI are fundamental to achieving sustainable development as are new forms of governance that promote broader participation in decision making in STI related issues and strengthening the science, society and policy interface. Building a culture of peace through innovative science diplomacy fosters global responses to transnational challenges including nuclear disarmament, spread of diseases, climate change, food, energy and water security, and many other aspects of international peace building efforts.

a) Science-policy-society interface

Strengthening the linkages between science, policy and society ensures that STI responds to the needs of society and that policies are informed by science to address complex sustainable development challenges. The latter are increasingly global and interconnected, such as climate change and biodiversity loss, economic growth and environmental sustainability. There is a need to strengthen the science-policy-society interface both at the national and global level. At the global level, UN Member States, at the UNCSD agreed to establish a High-level political forum on sustainable development under the General Assembly. (§85, *inter alia*, to “*strengthen the science-policy interface*” §85k) to discuss the coherence of the increasing number of scientific

assessments and intergovernmental agreements of relevance to sustainable development including the multilateral environmental agreements on climate change, biodiversity and combating desertification emanating from the Earth Summit in 1992.

Deriving from the recommendation 51 of the Report of the United Nations Secretary-General's High-level Panel on Global Sustainability, *Resilient People, Resilient Planet: A future worth choosing* (January 2012), the creation of the UN Secretary-General's Scientific Advisory Board (SAB) aims to address the need for an improved interface between science, policy and society, by, *inter alia*, ensuring that up-to-date and rigorous science is appropriately reflected in high-level policy discussions. The recently set-up Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES), supported by a partnership between UNEP, UNESCO, FAO and UNDP is an example of efforts to strengthen the science-policy interface in the field of biodiversity. With respect to climate change, the Intergovernmental Panel on Climate Change (IPCC) and the development of the Global Framework for Climate Services is a UN system-wide contribution in this respect. Other examples include the International Resource Panel (IRP), the Programme of Research on Climate Vulnerability, Impacts and Adaptation (PROVIA), the Science and Technology Panel of GEF. Many of the secretariats of multilateral environmental agreements (MEAs) have technical bodies that are at the interface of science and policy, such as the Subsidiary Body on Scientific, Technical and Technological Advice of the Convention on Biological Diversity. Such panels contribute to the science-policy interface in several ways. They bring together the scientific and policy-making communities in order to identify new scientific issues of impending importance to the policy community. They provide a forum for policy-makers to ensure that research is dedicated to critical knowledge gaps for addressing sustainability challenges.

Collaboration and cooperation between scientists and policy-makers as well as between scientific, technical and political developmental organizations need to be expanded for science, technology and innovation to be effective as development tools, for example through a *global science-policy interface* to maximize the extent to which development programmes are science-based.

b) STI education

There is a strong relationship between increasing educational attainment, facilitating social transformation, human development and economic growth. Investment in Science, Technology, Engineering and Mathematics (STEM), in particular at the tertiary level, is critical to developing the skills necessary for integration into today's labour markets and fostering innovation and economic competitiveness. Access to STI education is a powerful lever for young people to become the future advocates and agents of sustainable development, in particular in developing countries. A range of measures can ensure participation by women and girls to science and technology. These include making science curricula relevant to the needs of women and girls, promoting a positive image of careers in science and technology for women and girls, improving the retention and progression of women in science and technology for women and girls, ensuring that science, technology and innovation policies address the constraints faced by women entrepreneurs, achieving equal participation of women and men in decision-making in science and technology institutions, and encouraging the use of gender-based analysis and gender impact assessments in research and development in science and technology.

UNESCO promotes science and engineering education, in particular for girls and women. Through giving access to hands-on Microscience Kits, in over 70 countries where school laboratories are lacking, interest in science is encouraged among students, especially among girls. UNESCO is promoting engineering curriculum reform, and encouraging engineering students to

focus on sustainable development solutions to global and local challenges, for example in collaboration with the aviation industry. UNESCO supports capacity building in STI policy and indicators in particular in Africa.

c) Research, monitoring and observations

Research, monitoring and assessment build the knowledge base to inform decision-making. Research contributes to answering questions relating to sustainable development, monitoring builds systematic multi-year data sets necessary for identifying trends and constructing scenarios. Assessments provide the tools and evaluation criteria for policy-makers to inform their decisions and are necessary at national, regional and international levels to provide multi-scale perspectives and facilitate international cooperation.

The sustainable development research agenda is evolving to embrace sustainability science, by which the full range of the social and human sciences are mobilized to address complex challenges requiring multidisciplinary responses. UNESCO is a co-sponsor of the recently-launched Future Earth, an ambitious research programme aimed at further understanding the multifaceted effects of global change at multiple scales and the transformations that society needs to undergo to minimize its adverse effects.

Several multi-partner international assessments are periodically produced to evaluate critical sustainable development issues relevant to the MDGs such as *inter alia* the state of the world's freshwater, biodiversity and ecosystem resources and climate change. UNESCO leads the multi-agency UN World Water Development Report, bringing together around 30 UN agencies which takes stock of the critical issues related to the world's freshwater resources. UNESCO co-sponsored the Millennium Ecosystem Assessment (2000-2004) and the International Assessment on Agricultural Science & Technology for Development (IAASTD). The Intergovernmental Panel on Climate Change is a key assessment in bringing the scientific basis for understanding climate change to policy-makers.

Global observing systems are essential to understanding global change with respect to the ocean, climate change and terrestrial ecosystems. The Intergovernmental Oceanographic Commission (IOC) of UNESCO coordinates the multi-partner Global Ocean Observing System contributing to the knowledge base for understanding climate change. Other examples of UN-coordinated observing systems include the Global Terrestrial Observing System (WMO, UNESCO, UNEP, FAO and ICSU) and the Global Biodiversity Outlook (CBD – UNEP).

d) Science diplomacy

Science diplomacy refers to the act of using science and scientific collaboration to construct international partnerships as a component of foreign policy whether to support development efforts or to advance science. Science can build partnerships between countries which can be sustained irrespective of the political climate. To address international global sustainable development challenges including climate change, biodiversity loss, sustainable energy, freshwater management or ocean health, STI capacity development or technology transfer, international collaboration is necessary to share knowledge and skills and to collectively manage shared natural resources. Science diplomacy contributes to building the capacity of local scientists by giving them access to international services and facilities. It provides the opportunity for countries to build or improve relationships and to work together on issues that no single country can address alone.

UNESCO through its intergovernmental science programmes including the Intergovernmental Oceanographic Commission (IOC), the International Hydrological Programme (IHP) and the Man and Biosphere (MAB) Programme has been a leader in science diplomacy for over forty years.

e) Access, usage and application of knowledge and technology, including ICTs

ICTs can contribute to universal access to education, equity in education, the delivery of quality learning and teaching, teachers' professional development, access to knowledge and more efficient management, governance and administration of education, scientific programmes among others. This requires a holistic and comprehensive approach to promoting ICT in all spheres of society. Access, inclusion and quality are among the main challenges that need to be addressed.

Technology also plays a major role in the promotion of freedom of information. In fact, the Internet provides an unprecedented volume of resources for information and knowledge and opens up new opportunities for expression and participation. Therefore through the Internet, technology can contribute to development, democracy and dialogue.

Technology plays also an important role in improving governance structures and services, facilitates transparency of government activities and promotes the involvement of citizens in choices affecting society.

Expanding access to broadband infrastructure has a key role to play in sustainable development, particularly developing economies including the sharing of new scientific knowledge and technologies. It allows enterprises and customers to explore new opportunities and services, such as obtaining information on market prices. The economic and social case for developing broadband access is very strong and takes on added significance for rural and remote communities, where improved communications can address a variety of challenges posed by distance⁵.

g) STI policies

STI is a missing pillar in the current MDG agenda. The current post-2015 process provides an opportunity to bring the power of tailored STI policies, including mobilizing local knowledge to steer development towards sustainability in such areas as improving water management to increase access to clean water and sanitation, providing safe food and protection from pandemics such as malaria and HIV, and satisfaction of basic energy needs.

National STI policies with clearly articulated STI plans provide governments with the opportunity to address the gaps and weaknesses of the MDGs by linking them to knowledge systems. STI policies that are strategically linked to education, economic and industrial policies can be used to improve the employability of youth. It can also facilitate knowledge-based innovation and increase productivity.

The development of STI policy requires a continuous dialogue between scientists, policy and decision-makers and society. For the least developed countries as well as for the small island developing states, the application of STI for sustainable development have not achieved their potential. STI policies must serve people and society in their development efforts.

⁵ What role should governments play in broadband development? Tim Kelly, Victor Mulas, Siddhartha Raja, Christine Zhen-Wei Qiang and Mark Williams, World Bank.

UNESCO has been working with more than 20 African countries in reviewing and formulating their national STI policies, as part of its efforts to support the implementation of the AU Africa's Consolidated Plan of Action for Science and Technology. In parallel, UNESCO has facilitated the Pacific science-policy and university networking dialogue. This process has led to the identification of STI-related policy gaps specifically in relation to national and regional development plans and frameworks in the Pacific, with particular reference to the unique context of small island States in the Region. As a result, a Pacific Universities Research Network (PIURN) has been created to further advance the Pacific science-policy framework development.

Women often remain at the margins of STI systems both in terms of participation and reaping the rewards. UNESCO has been a pioneer in the field of promoting gender equality in science. The UNESCO-L'OREAL Partnership "For Women in Science", the UNITWIN/UNESCO Chairs Programme and activities in the basic and engineering sciences place special emphasis on supporting women scientists, in particular young women scientists. Since 1998, the L'Oréal-UNESCO Awards have recognized 64 laureates from 30 countries, exceptional women who have made great advances in scientific research. Two of them have gone on to receive the Nobel Prize. To date, Fellowships have been granted to more than 1,200 women in 103 countries, permitting them to pursue their research in institutions at home or abroad.

B. Culture and the role of the creative sector in supporting sustainable development

a) Culture: an enabler and a driver of sustainable development

While the intrinsic linkages between culture and sustainable development have been recognised since the 1960s, culture, was not included in the MDGs established in 2000. However, the role of culture in achieving more equitable and sustainable development has recently been the focus of renewed interest by the international community. In 2005, the World Summit Outcome Document, adopted by the UN General Assembly⁶ acknowledged the diversity of the world and recognised that all cultures contribute to the enrichment of humankind. The Outcome Document of the Millennium Development Goals Summit (2010)⁷, two Resolutions of the UN General Assembly (65/166 of 2010⁸ and 66/208 of 2011⁹), as well as numerous regional and international recommendations also reflect this recognition, which stemmed from reality at country level and the need to broaden the terms of development in order to ensure effective and sustainable development. These documents strongly called for the mainstreaming of culture into development policies and strategies, both as an enabler and as a driver of development.

The Rio+20 Outcome Document, "The Future We Want", contains a number of important references to the role of culture for sustainable development, including with regard to fostering peace and security¹⁰.

⁶ <http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N05/487/60/PDF/N0548760.pdf?OpenElement>

⁷ <http://www.un.org/en/mdg/summit2010/pdf/mdg%20outcome%20document.pdf>

⁸ http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/65/166

⁹ http://www.un.org/ga/search/view_doc.asp?symbol=%20A/RES/66/208

¹⁰ For instance, the mention concerning the preservation of cultural heritage (para 30), "...the natural and cultural diversity of the world and recognize that all cultures and civilizations can contribute to sustainable development" (para 41), the revitalization of historic districts, and the rehabilitation of city centers" (para 134), intrinsic value of biological diversity, as well as its ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values" (para. 197)

Recognising that development becomes sustainable only when growth and human and societal development are mutually reinforcing - and that “one size does not fit all”¹¹, the cultural aspects of development have been seen as equally important as its economic components. Culture, as an enabler, is an essential component of human development that represents a source of identity, innovation and creativity both for individuals and communities. It is also an important factor of social inclusion and poverty reduction, contributing to economic growth and the ownership of development processes, as a driver. Cultural diversity enriches human and social development, leading to enhanced livelihoods and more diverse capital for the populations of the world in developed and developing worlds alike.

The concrete contribution of culture in the achievement of the internationally agreed development goals for sustainable development is manifold, as shown in the subsequent chapter IV.

To build new development pathways, it is essential to recognise that the power of culture, by virtue of its cross-cutting nature, strongly influences formal and informal institutions relating to the social, economic and political aspects of our lives and that it shapes human approaches towards the concept of ‘development’. The future development agenda should build on globally accepted values such as human rights and equity, while at the same time duly taking into account cultural diversity and local specificities, which is key to any development initiatives that aim at maximising the effectiveness of aid by strengthening participation and ownership. An integral part of human rights, cultural liberty and rights, enhance an individual’s sense of belonging, identity, and rootedness, which is conducive to living a more fulfilled existence¹².

b) The creative sector, its social and economic impacts in sustainable development

The creative sector which is closely connected with our tangible and intangible heritage through a cultural continuum, stands as a driver of inclusive economic and social development by adding value to economic activities relating to culture (e.g. architecture, the arts, crafts, design, fashion, film, music, publishing, R&D). The sector generates and exploits knowledge and information, and it triggers innovation, thus creating social and economic wealth for societies as a whole. It also demonstrates how diversity and creativity, combined with scientific knowledge, notably through sustainable design and eco-arts, can bolster nationally and internationally agreed development goals and contribute to economic growth and technological innovation. This strong linkage between the creative sector and its contribution to sustainable development can also be partly explained by the fact that artists and other creative professionals are also often strong proponents of the ‘culture of sustainability’.

The creative sector fosters human creativity and context-based development approaches that can deliver benefits well beyond the economic dimension. It contributes to an increase in capabilities and well-being, especially in cities, which are of the utmost importance for future development challenges, by means of poverty reduction and the inclusion of women, ethnic minorities, youth and other marginalised groups. In the face of urban growth resulting from exponential migration flows and the development of multicultural societies, a dynamic creative sector is key to building sustainable cities and ensuring social inclusion. The elaboration of youth programmes introducing ideas of cultural diversity and a culture of peace into the urban environment demonstrates successful results. Different forms of creativity deliver cultural and social values, in

¹¹ “Realising the Future We Want for All”, op.cit.

¹² UNDP Human Development Report (2004): Cultural liberty in today’s diverse world, accessible online at http://hdr.undp.org/en/media/hdr04_complete.pdf

addition to economic value, increasing human resilience in financial, social and ecological terms. For instance, apart from its social and economic contribution to sustainable development, innovative architectural and urban development using materials and techniques that respect the environment enables the building of sustainable infrastructures and energy saving.

The creative and cultural industries¹³ are one of the most dynamic and rapidly expanding sectors in the global economy, with a growth rate of 17.6% in the Middle East, 13.9 % in Africa, 11.9% in South America, 9.7% in Asia, 6.9% in Oceania, and 4.3 % in North and Central America. In 2007, the cultural industries accounted for more than 3.4% of global GDP, with a global market share of approximately 1.6 trillion USD¹⁴. In Tunisia, 300,000 craft workers produce 3.8% of the country's annual GDP¹⁵. In Ecuador in 2010, private and formal cultural activities represented 4.76% of GDP¹⁶, only the tip of the iceberg of what could be a much larger contribution of the culture sector to the national economy if all informal and non-commercial activities related to culture were accounted for. In Indonesia, 54.72 billion USD, the equivalent of 7.08% of GDP and 10% of export were represented by the creative industries in 2010, and also in Thailand 36.4 billion USD, the equivalent of 10.33% of GDP, through the creative industries.¹⁷

Cultural tourism, relying on tangible and intangible cultural assets, accounts for 40% of global tourism-related revenues and is one of the fastest-growing economic sectors, especially in developing countries. Cultural tourism both accelerates investment in culture and creativity, thus revitalising the economy of cities, and contributes to the preservation of diverse forms of heritage. It also promotes intercultural dialogue. Equitable cultural tourism can provide further opportunities for government and local stakeholders, notably civil society and marginalised groups to create, produce, and disseminate local creative works. In this way, rather than merely relying on a precarious form of foreign investment which cannot ensure the fair distribution of wealth, cultural tourism has the potential to increase the access of citizens to a diversity of locally produced cultural goods and services.

C. The changing geography and models of innovation

According to the *UNESCO Science Report 2010*¹⁸, China is on the verge of overtaking both the USA and the EU in terms of sheer numbers of researchers. These three giants each represent about 20% of the world's stock of researchers. If we add Japan's share (10%) and that of Russia (7%), this highlights the extreme concentration of researchers: the 'Big Five' account for about 35% of the world population but three-quarters of all researchers. By contrast, a populous country like India still represents only 2.2% of the world total and the entire continents of Latin America and Africa just 3.5% and 2.2% respectively. The new geography of global science will call for a challenging role of higher education in terms of knowledge creation and sharing as well as in terms of reshaping the world's human resources in S&T.

a) New players in STI (BRICs, etc.)

¹³ The major fields of the cultural and creative economy relate to the diversity of cultural expressions and heritage preservation, the development of creative cities, citizenships and cultural rights, as well as all related capacity-building activities.

¹⁴ PricewaterhouseCoopers, 2008.

¹⁵ UNESCO World Report: Investing in Cultural Diversity and Intercultural Dialogue, 2009.

¹⁶ Censo Económico de Ecuador de 2010, INEC, following the methodology of the UNESCO Culture for Development Indicator Suite.

¹⁷ WIPO, 2012.

¹⁸ UNESCO Science Report, UNESCO, 2010, <http://www.unesco.org/new/en/natural-sciences/science-technology/prospective-studies/unesco-science-report/>

In his report A/67/348 of 4 Sept. 2012, the Secretary-General outlined recent trends in the models and geography of innovation. In the past twenty years, patterns of technology flows and transfer have changed significantly. A number of technology-intensive developing countries have gained a much greater role, but poorer and smaller economies have become increasingly marginalized. South-South clean technology transfer has become increasingly important, despite the persistence of barriers.

Not only the overall magnitude, but also the nature of cross-border technology flows has changed. Technology flows are increasingly embedded in global trade and foreign direct investment flows, thus forming part of international production systems, even though there are significant regional differences. In terms of manufacturing and export of clean technology, several large developing countries have become world leaders, and some are also emerging as the most important users. Brazil, Russia, India, China and South Africa (BRICS) are experiencing major structural, economic and political changes. They are expected to change the international socio-political landscape because they offer numerous investment possibilities in production and prospects through their consumer markets¹⁹. The 'BRICS account for more than 40 per cent of the global population and a share in world GDP that has increased from 16 per cent in 2000 to around 25 per cent in 2010'²⁰. Before South Africa joined the BRICs' share of the global GDP was 18.48 trillion (World Bank 2011). Therefore, the fall in their contribution to world GDP last year was a worrying sign though GDP performances overall for most countries were low²¹. Nevertheless, they are still widely considered as the driving force behind global growth. STI has played a major role in repositioning the economies of these countries and their best practices in this area may serve as new models of innovation and reveal development alternatives that might support the efforts of developed and less developed countries addressing their challenges.

The innovation systems of BRICS are a reflection of their historical and cultural contexts with the exception of Russia and China colonization played an important role in explaining their approach to science and technology and reforms in general²². At a glance, it appears that the BRICS have been implementing similar STI policies that targeted innovation and infrastructure reform however; the ways in which these policies were implemented are different²³. This difference in approach and their geopolitical position contributed to varied results in production output in various sectors and technological structures. For Example India's structural changes benefited domestic capital production (in areas such as pharmaceuticals, chemicals and the auto industry) and only in the later stages allowed for penetration of foreign capital. It also enabled the country to have a strong defence related technology and infrastructure²⁴. This allowed for consolidation of private groups and the government took a strategic decision to maintain telecommunications under its control. China's transformation on the other hand was more profound and followed significant increase in scientific and technological structures. The government focused on stimulating locally controlled firms and linking its industrial policies to internal markets. Some of these firms created were spin offs from research conducted by universities while most of them were controlled by government but eventually became privately owned. China also succeeded in

¹⁹ Science, Technology and Innovation Policies in the BRICS Countries: an introduction José Eduardo Cassiolato, Helena Maria and Martins Lastres Anthem Press, ©2009.

²⁰ THE BRICS REPORT by Ministries of Finance, Central Banks and Economic Institutions of BRICS Nations, <http://www.brics.utoronto.ca/docs/120329-brics-report-summary.pdf>

²¹ World GDP, June 26th 2012, 18:27 by The Economist online, <http://www.economist.com/blogs/graphicdetail/2012/06/focus-3>

²² Science, Technology and Innovation Policies in the BRICS Countries: an introduction José Eduardo Cassiolato, Helena Maria and Martins Lastres Anthem Press, ©2009

²³Ibid pg. 29.

²⁴ Ibid pg. 29.

mobilizing education systems in accumulating production capabilities at high rates and has envisioned areas in the future for technology opportunities and is redirecting policy towards innovation for the domestic economy.²⁵ ²⁶ South-South and triangular cooperation should be further utilized for assisting the developing countries to develop similar examples of best practices and adapt the experiences and policies developed by the BRICS but also by the OECD countries.

b) Internationalization of R&D and innovation

Mirroring the changing patterns of technology flows, research, development and demonstration stocks and flows have changed, illustrating a much more important role for technology-intensive developing countries. Research and innovation have not escaped the forces of globalization and the internet and as such, it has influenced the way in which research is conducted, shared and the rate of innovation and collaboration in innovation. There is another belief that the evolution of research and development is natural and results from demands of the international economy. Despite the differences in opinion on how it occurred, it's still not clear if the internationalization of R&D means improved access and increased dispersion of knowledge or if it attaches a price tag to knowledge and methodologies and creates a type of a hegemonic governance of intellectual work? Addressing this concern is probably the major research related challenge of this generation.

Both public and private sectors are internationalizing their efforts in order to access and make use of globally dispersed knowledge and connect with important innovation hubs in new markets²⁷. For instance, this may involve universities and other research institutions making every effort to attract and retain the best talent in order to secure stable research financing while private companies search for the most suitable innovation environment in which to locate or secure skilled personnel, supportive business conditions and access to strategic customers and markets²⁸. In this kind of environment, governments tend to build a stable environment in which R& D can drive economic growth and policy makers tend to be expected to encourage to enable domestic actors to connect to global leading knowledge and innovation hubs that are expected to benefit local and regional innovation systems. Though this approach may benefit national systems by connecting it to external markets and research systems, and facilitate international cooperation, it may also provide the opportunity for international efforts to monopolize national research agendas and stifle endogenous thinking and approaches.

There are a number of other factors involved in the internationalization of research that are of major concerns. Strengthening research and development, and innovation has the potential to ensure economic growth, competitiveness. The challenge is ensuring that R&D infrastructure is able to create knowledge used by commercial entities and solutions for global challenges. Another challenge involves establishing institutes that succeed at providing these solutions as centres of excellence in various disciplines, linking them to national and regional sectors and allowing them to participate in technology transfer with a focus on medium and innovative firms. However, in some developing countries the major concern is establishing an innovation cycle

²⁵ Science, Technology and Innovation Policies in the BRICS Countries: an introduction José Eduardo Cassiolato, Helena Maria and Martins Lastres Anthem Press, ©2009.

²⁶ Science, Technology and Innovation Policies in the BRICS Countries: an introduction José Eduardo Cassiolato, Helena Maria and Martins Lastres Anthem Press, ©2009.

²⁷Internationalization of Research and Innovation –new policy developments Sylvia Schwaag -Sergey and Emily Wise http://iri.jrc.ec.europa.eu/concord-2010/papers/schwaag_serger_wise.pdf

²⁸ ibid

suitable to the cultural context and perhaps shortening it to facilitate the smooth transition of knowledge to enterprise and access to the research efforts of commercial entities.

Another issue is resolving efforts of research organisations that push for the commercialization of R&D activity, including the application of appropriate intellectual property rights to support new technology-oriented firms versus allowing open access to information and methodologies. The positive side is that internationalization of R&D is associated with increased investment in high quality infrastructure for research and development at higher education institutions which benefits students and also attracts professional workers in research and development and contributes to building human capital in the future for research, development and innovation activities.

UNESCO and its partners are playing a major role in redefining the international research landscape by encouraging international research processes that are integrated, solutions-oriented and policy relevant, interdisciplinary and incorporating local knowledge systems and involving multiple players. To this end the Future Earth initiative was launched in 2012 to help establish co-designed research, technology and policy agendas. This 10-year initiative on global environmental change research for sustainability will coordinate scientific research which is designed and produced in partnership with governments, business and, more broadly, society.

UNESCO fosters the development, management and governance of science and technology parks, managed by specialized professionals bringing together scientific research, business and governmental organizations in a single physical location to promote and showcase technology, innovation, incubation, exchanges, training, and market development. UNESCO's works in close cooperation with the international professional organizations in this field, including the World Technopolis Association (WTA).

D. Addressing the issues of inclusion and equity in the application of STI and culture

Social impacts of STI – or its absence – on reducing inequality and facilitating social inclusion

The notion that the issues of environmental degradation and human development must be resolved simultaneously and in a reciprocally supporting manner have been widely recognized at least since the publication of the Brundtland Report (1987).

Sustainability is fundamentally a political act. There are multiple and conflicting views of sustainability that cannot be reconciled and no particular approach should be seen as the right one. This is not a matter that could be solved only through the application of expert understanding since the existence of multiple and conflicting values, moral judgments and belief systems crucially shape notions and practices of sustainability. The relevance of philosophical and moral judgments is decisive when defining the desirable relationship between humanity and nature.²⁹

Thus, scientific and technical solutions are necessary but not sufficient for achieving sustainability. Any attempt to contribute, through STI, to promote sustainable development must incorporate a recognition of the social construction of sustainability.

²⁹ Robinson, John. *Squaring the circle? Some thoughts on the idea of sustainable development*. Ecological Economics. 48 (2004) 369- 384. Elsevier. London.

Achieving STI- based reductions in the negative impacts of economic activity does not automatically result in improving the life of all people. Sustainability requires addressing social inclusion, patterns of production and consumption, exploitation, and many other social problems.

Moreover, the application of STI to the reduction of inequality and to achieving social inclusion must include mechanisms for engaging civil society in debates and decisions concerning sustainability. UNESCO is committed to address the challenge of how to combine scientific and non- scientific knowledge, how to differentiate between research and advocacy, how to foster innovative partnerships between scientific networks and the different social communities in which science exists, in order to advance the MDGs and sustainable development.

Among the multiple challenges to sustainability are structural changes in the economy, leading to new patterns of social inequality and exclusion as well as the rapid growth of the middle cases in the developing world; changing conceptions of political legitimacy and authority, connected both to social and to technological change; demographic mutations, in a fast ageing world with a high proportion of young people; the rapid development of science and technology, including in ethically challenging areas; environmental pressures, which will in particular threaten food security, freshwater availability, biodiversity and the climate; and shifting ideas and beliefs that, in some cases, will sharpen tensions and conflicts between countries and social groups

Furthermore, some key transformations have the potential to destabilize already fragile social and environmental systems, leading to the risk of denial of or failure to realize basic human rights, along with exacerbation of extreme poverty.

Societies that are insufficiently inclusive are not simply open to criticism in normative terms. Insufficiently inclusive societies are also likely to be unstable and to deal inadequately with the specific challenges that they face. Alongside mobilization of the scientific evidence base for appropriate policies, more participatory approaches to policy design and implementation is an essential dimension of inclusion. Opening the playing field to neglected actors – especially women and girls – and to their perspectives, knowledge and life experiences sow the seeds of just, effective and sustainable responses. To this extent, upholding the right to freedom of expression is inextricably linked to social inclusion. In the end the challenge consists in incorporating STI into the larger social process of “negotiating” sustainability with a variety of social actors and also involving STI mechanisms in the discussion of the ethical and moral issues around which sustainability revolves.

The UNESCO Management of Social Transformations (MOST) Programme aims at strengthening regional and national capacities to assess, compare and reform national policy and regulatory frameworks with a view to increasing their inclusiveness. The focus will be on upstream assessment of policy and regulatory frameworks, which are essential factors affecting social inclusion in any given jurisdiction: limitations and loopholes in policy and regulatory framework trickle down from the upstream policy level to national and sub-national government planning, budgeting and programming resulting in systemic barriers that impact the welfare of the general population and push those excluded from the social mainstream even closer to the edge. Assessing the policy and regulatory frameworks in terms of their social inclusiveness, identifying existing barriers and loopholes, and formulating policy options and recommendations for revision or reform of these frameworks is, therefore, a crucial step in building an inclusive environment in any given jurisdiction. MOST work in this area to make social inclusion an over-arching goal and a core component of all government policy and planning processes will thus support harmonized rights-based national and/or sub-national policies and regulations that are conducive to inclusive societies and guarantee equal access to opportunities for all.

III. Shaping the course of development: the role of STI

STI impacts upon the process of inclusive and sustainable development in multiple ways. STI will therefore be an important dimension of any future global partnership for development if it is to deliver global public goods, such as greater food security, access to health and water, climate mitigation and adaptation, and access to energy for all. STI also have a critical developmental dimension: they are important prerequisites to ensure an on-going process of structural change that leads to peace, social inclusion, reduction of inequalities, green economies, inclusive growth and rising living standards. This is not a one-way process: around the world, citizens and laypeople, including women, youth, local communities and indigenous peoples are becoming engaged in the multiple processes that give rise to STI, including its governance. In this context, all citizens, including women, youth and local communities, are not only considered beneficiaries of STI but also agents of change. Ultimately, such sustainable development alone holds the key to poverty reduction, employment creation and prosperity for all.

Recent work on the post-2015 agenda has taken a step in the right direction by recognizing the importance of knowledge and STI capacity in the new developmental agenda. However, we need to better understand and build STI capabilities and orientate STI policies to respond to development needs, identify the various channels for knowledge creation and diffusion and the possible obstacles that can hinder that flow to developing countries and to set out the ways and means to stop the technological divide from growing wider and to promote, instead, sustainable development for all. Furthermore, the development of STI should be thought in a systemic way giving particular focus on the nexus between STI, culture and development.

A. Filling the MDGs Gap

Mainstreaming STI to support achievement of the MDGs

The MDGs are a reflection of the hopes and time in which they were designed. The Nations of the world stood united against its major shared challenges and together committed to addressing them within an agreed time frame. These include halving extreme poverty and hunger, achieving universal primary education and gender equity, reducing under-five mortality and maternal mortality by two-thirds and three-quarters respectively, reversing the spread of HIV/AIDS, halving the proportion of people without access to safe drinking water and ensuring environmental sustainability³⁰. To date, though major progress has been made towards achieving these goals there is still room for improvement. It is not completely clear why, because the experience of each country is different and member states employed the most appropriate mechanisms suited for their countries. Additionally, it is argued that some regions were more affected by these global challenges than others and found themselves at a greater disadvantage from the onset, while others encountered more challenges (mostly unforeseen ones) than others while trying to meet the targets.

Although not much information is available to delineate the precise impact of the multiple global crises on MDG achievement, many African countries were sharply affected by these shocks and were making steady progress toward attainment of the MDGs prior to the global crises³¹. In 2000 no one had foreseen the fuel, food, and economic crises that would stand in the way of achieving these goals and so, in 2015 a more effective way of achieving these goals taking into

³⁰ Engineering the Millennium Development Goals, Dato Iee Yee-Cheong, Russel C. Jones.

³¹ Assessing Progress in Africa towards the Millennium Development Goals MDG Report 2010.

consideration the lessons of the past 15 years will have to be found. The answer rests in the power of Science, Technology and Innovation. MDGs targets concerning issues such as poverty, education, gender equality, child and maternal mortality, HIV/AIDS, malaria, and other major diseases will require access to essential medicines and technology in order to address them. Additionally, other goals that focus safe water, the environment trading systems will require appropriate technology transfer.³² New knowledge and creativity is what is needed to effectively address each goal and the challenges faced in achieving them. Science Technology and Innovation provides the knowledge, and creativity to address these challenges. For example technology can be used in schools through ICT applications and improve the delivery of education particularly in remote areas. In the health sector it can facilitate knowledge transfer and efficiency through telemedicine.

B. Integrating STI and sustainable development

Integrating STI to support the Sustainable Development Goals (SDGs)

The shaping of the post 2015 development agenda provides a great opportunity to illustrate how STI are important prerequisites for structural and social transformation that enables economic growth and human development, which are the keys to poverty reduction and economic growth. STI hold the knowledge and expertise that can together and sustainably address issues concerning equality, the environment and the economy encouraging sustainable societies.

Science and technology, and innovation derived from their applications, will revolutionize the post-2015 development. Critical to this new approach is the forging of Partnerships to strengthen the scientific and engineering capabilities of developing countries. This will need to be complimented by together with global and regional coordination to foster research, product development, and technology access, transfer and adaptation, will be crucial for enabling transformative development. As outlined in the report of the UN system Task Team on post-2015 UN development Agenda, there are many ways in which may advance the post-2015 development agenda these include; technology, information networks and people-led innovation that will help drive progress towards food and nutrition security; affordable health services; sustainable energy use and natural resource management; greater resilience to shocks; effective responses to climate change and more equitable and sustainable patterns of consumption and production³³

While development of these goals is still in the pre-negotiation the Rio+20 Outcome document includes several “Thematic areas and cross-sectoral issues.. In order to connect STI to the priorities of the post 2015 Agenda clear linkages must be made between research and innovation systems and institutions and actors focused on those goals. For this, creative ways can be found to engage Universities, innovative spaces, science parks and higher education institutes in monitoring and designing solutions that will address local targets and activities; for example, engendering problem solving scientists that are geared toward resolving major societal issues.

National STI strategies linked to Action Plans for Sustainable Development play a major role in linking STI to sustainable development processes. These actions should be complimented by efforts to increase innovation capacities for sustainable development, green technology transfer and scientific capacity-building in developing countries.

³² Engineering the Millennium Development Goals, Dato lee Yee-Cheong, Russel C. Jones

³³ http://www.un.org/millenniumgoals/pdf/Post_2015_UNTTreport.pdf

STI can contribute to areas such as water, oceans, biodiversity, disaster risk reduction which are of priority to UNESCO. Freshwater is a vital resource for human health, prosperity and security. Around 80% of the world's population is exposed to high levels of threat to water security, in terms of water availability, demand and hazards among other factors. We need to move beyond the MDG on water and mobilize international co-operation, strengthen the science-policy interface and develop institutional and human capacity to ensure water security. The ocean shapes our climate and influences the distribution of ecosystems, biodiversity, and thus food availability across the globe. Moving towards sustainable development of the ocean requires strengthening global scientific efforts to fully comprehend and protect coastal and marine environmental health, as well as to conserve biological diversity, and mitigate the impact of ocean threats, such as ocean acidification. Policy making and implementation related to sustainable development must begin, and end, with collecting and analyzing data and information on the status and trends in natural systems, and on relevant related human systems. Biodiversity is crucial for reducing poverty in view of the basic goods and ecosystem services it provides. The world is losing its biodiversity at an unprecedented rate. Each year we are losing ecosystem services worth an estimated US\$ 68 billion from land-based ecosystems alone. International scientific collaboration is key to conserving biodiversity. Building inclusive community resilience from disasters such as floods, droughts, earthquakes and tsunamis must be urgently addressed. Efficient national and regional plans to enhance community resilience for human security threats can be designed by developing science-based options for building community resilience in high risk areas.

Additionally, greater efforts must be made to continue encouraging high-level political support to build sustained international partnerships for integrating STI into sustainable development mechanism. One example of this is the Forum on Science, Technology and Innovation for Sustainable Development that was organised by UNESCO and ICSU before the Rio+20 in Rio was used to show the science policy linkages to sustainable development to participants of the summit. During the summit, a discussion was held on the increasing collaborative engagement of indigenous and scientific knowledge holders in the equitable co-production of new knowledge to inform innovative solutions to complex sustainable development challenges. These efforts culminated with announcement of the creation of an international scientific advisory board to provide the secretary general with guidance on science-related issues, and to provide advice to UN member states on such issues.

C. Strengthening multi-stakeholder collaboration and building partnerships

a) Private sector

The United Nations provides an inclusive and comprehensive global platform for objectively discussing the views of all governments and a range of stakeholders. This makes the UN fertile ground for the forging of multi-stakeholder partnerships. It is therefore a safe and accountable mechanism for private sector investment and also provides a window through which multinational corporations can actively address global challenges in line with Internally Agreed Development Goals. The increasing interconnectedness of today's world demands national actors with global outlook and current efforts to relook the MDGS, the development agenda and define SDGs provides a good opportunity to engage private sector entities as innovators, knowledge holders and resourceful leaders of constituencies. Strengthening the actions of the UN in STI allows for the engaging of new actors and strengthening relationships with existing actors interested in using science for development. A good example of this kind of partnership is the *UNESCO-I'Oréal For women in Science* programme that recognizes outstanding women scientists and supports their research efforts.

There is a similar need to strengthen the linkage and networking among the ministries of public service, management development institutes, universities and other key stakeholders so that technology is applied to the benefit of the full spectrum of society.

b) Public-private partnerships

The forging of Public Private Partnerships (PPP) is a key policy tool for addressing global challenges. They are fundamental to encouraging university-industry linkages, which are critical in encouraging innovation and translating knowledge into enterprise. PPPs allow all stakeholders across the Government and private sectors to use their expertise and resources to participate in various STI sectors to address the MDGs. One clear area for technology transfer is in the application of ICTs. Reliable information and communications infrastructure is essential for collaboration within and between countries, it supports research, health services, connect universities with higher education institutes.

An example of a programme which encourages technology transfer is the UNESCO's University-Industry-Science Partnership (UNISPAR) programme that aims to improve the quality of universities in developing countries and encourage them to become more involved in industrialization processes in their country. It assists universities in developing countries in forging partnerships with industry, in order to strengthen their capacity for innovation, so that they can embrace the knowledge economy and sustainable development.

Partnerships with local and vulnerable communities including SIDS, indigenous peoples, and women should also be enhanced in order to make STI more inclusive and accessible to all citizens, which should be considered not only as the final beneficiaries of innovation and technologies but as the main actors of change. Measures for strengthening their capacities to access and to absorb the technological changes should be developed.

IV. Shaping the course of development: the potential of culture

A. Filling the MDGs Gap

a) Mainstreaming culture to support the achievement of the MDGs

One of the identified gaps of the MDGs is the focus on outputs, that is, the 'what'; with less concern for processes, that is, the 'how'. The failure of some well-intended projects and initiatives aimed at achieving the MDGs has been attributed to a certain lack of consideration of the specific setting in which the projects were being conceived and implemented, in other words of how things would be received and carried out within the specific context for which they were designed. Arguably, a stronger concern for the local cultural perspectives would have made those projects more effective and increased local ownership.

Three years before the end of the MDG cycle, and while the international community is taking stock of achievements in order to agree on a way forward with a post-2015 development agenda, mainstreaming culture within development efforts is crucial in order to address the large number of global challenges set out in the current MDG objectives and targets.

The direct impact of culture-related field operations in achieving the goals of the MDGs more effectively, on the other hand, has been clearly demonstrated by numerous projects and those

which were jointly implemented by various UN agencies and funded under the Thematic Window on Culture and Development of the MDG Achievement Fund (MDG-F)³⁴. For example:

- a. Cultural projects and culturally-sensitive approaches in general drive and enable the alleviation of poverty (MDG1), by addressing its human, social and economic dimensions. Creative sector activities, notably creative industries, heritage related programmes and the development of equitable cultural tourism, not only have yielded jobs and an increase in local livelihoods, but also created and broadened human capabilities with the strong involvement of women, indigenous groups and youth at a local scale. Through capacity-building in both technical and managerial competencies, culture-related projects have not only fostered human capabilities, but have also contributed to the development, production, distribution and consumption of cultural products and services, thus increasing incomes and creating employment and market opportunities in related sectors.
- b. Culturally adapted educational programmes support and improve universal primary education (MDG2) through the promotion of intercultural understanding and the integration of disadvantaged and minority groups into the education system. The way people learn and transmit knowledge varies according to their different geographical, historical and linguistic backgrounds. Therefore, education strategies that are most responsive to local cultures, contexts and needs are the most likely to be effective in fostering more cohesive societies.
- c. Culture-related projects are contributing to the empowerment of women and directly or indirectly contribute to the achievement of gender equality (MDG3), by contributing to innovative attitudes and fostering a culture of gender equality. The creative sector provides great opportunities for women to increase their capabilities and opportunities in social, economic and institutional contexts, through employment and entrepreneurship. For instance, the participation of women in the crafts sector has been shown not only to strengthen women's economic opportunities, but also to improve their role in the household and community alike, leading to a reduction in gender-based violence and an increase in the ability to manage household budgets.
- d. Culturally sensitive approaches to health can enhance the effectiveness of the related programmes (MDGs 4, 5 and 6). A number of successful public health policies are culturally and ethically adapted and are context-specific in their biomedical, behavioural and structural interventions. The cultural adaptation of health techniques, information dissemination through cultural institutions and culturally adapted communication strategies, and the promotion of dialogue between formal and traditional health practitioners can all increase the impacts of health programmes and lead to the inception of new governance and policy framework.
- e. Many cultures regard nature as an extension of society, making culture-sensitive stewardship of environment an integral part of sustainable development (MDG7), through the safeguarding of ecological and cultural uniqueness of the world. The national, regional and international policies for the preservation and revitalisation of cultural and natural heritage, have greatly contributed to preventing the loss of outstanding cultural and natural sites, cultural landscapes, and historic urban and rural environments³⁵. The conservation of historic cities and districts as opposed to their replacement by new buildings has long been recognised as an important strategy to reduce environmental footprints by reducing CO₂ emissions. Resilience to natural disasters is enhanced through the use of locally specific techniques and construction materials, in addition to community-based preparedness actions. The reappraisal

³⁴ With a budget of 95 million dollars USD and UNESCO acting as convener, 18 joint programmes were supported worldwide under an inter-agency initiative. See the dedicated site at <http://www.unesco.org/new/en/culture/achieving-the-millennium-development-goals/mdg-f-culture-and-development/>

³⁵ The 1972 UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage, with 190 Member States.

of local and indigenous knowledge systems and environmental management practices in preserving and managing natural resources³⁶, prevent the loss of biodiversity, reducing land degradation and mitigating the effects of climate change³⁷. Culinary traditions and the use of native ingredients also contribute to reinforcing more sustainable consumption patterns and to the preservation of biodiversity. Some creative projects and educational programmes successfully use arts and culture-related activities to enhance effective communication about environmental issues by blending creativity with environmental-preservation projects.

- f. Culture-related actions can also strongly promote the development of a global partnership for development (MDG8). Culture-related projects increase community participation through new networks, partnerships and participatory processes that involve a variety of governmental and non-governmental actors, as well as the private sector and civil society. Networks and communities of practitioners are formed through greater access to new technologies, especially information and communication technologies.
- g. Intercultural dialogue is a prerequisite for all development endeavours as it is essential for nurturing a culture of peace³⁸, thus preventing conflicts and securing the rights of marginalised groups. Globalisation and technical advances should be guided by the principle of human security, which relies on understanding, reconciliation, and the respect of identity. We live in an increasingly interconnected world, where societies are exposed to growing pressure from economic crises, climate change, migration and demographic trends. In order to meet such challenges, there is a need for efficient educational strategies and cultural initiatives for intercultural dialogue and respect for human rights and cultural diversity that can reinforce equality, justice and political inclusion in multicultural communities.

B. Integrating culture and sustainable development

a) Integrating culture to support the Sustainable Development Goals

1. As demonstrated above, culture provides an entry point, as an enabler and a driver, in virtually all sectors of sustainable development, encompassing the social dimension, inclusive economic development, environmental sustainability³⁹ and peace and security.
2. Greater emphasis on context- – notably in cultural terms – within development policies and programmes, would enable a more effective, inclusive and human-centred approach to development.
3. At the same time, the great potential of culture – intended as a sector of activities - to deliver sustainable development benefits should be harnessed by conserving, promoting and making accessible cultural resources, ranging from tangible and intangible heritage, the arts and the wider creative sector and industries. Of particular significance, in this regard, is the role of culture within an inclusive social development, particularly in enlarging people’s capability to “lead the lives they have reason to value”, through full

³⁶ “Traditional Knowledge in Policy and Practice: Approaches to Development and Human Well-Being” (UNU Press 2010), supported by UNEP, deals with different issues concerning traditional knowledge and resource management, including the role of traditional knowledge in water management.

³⁷ UNEP implemented the Nomadic Herders project (www.nomadicherders.org) or UNDP-GRID/Arendal partnership project ‘Many Strong Voices’ (www.manystrongvoices.com) or a UNEP Green Economy Initiative in partnership with African Indigenous leaders (http://www.unep.org/civil-society/Portals/59/Documents/publications/UNEP_GEI.pdf) to tackle challenges of climate change and livelihoods.

³⁸ Projects aimed at promoting intercultural education, led in Bosnia and Herzegovina, or Ethiopia within the framework of MDG-F, among others, effectively contributed to joint learning of students and children from diverse communities.

³⁹ UNEP’s various initiatives such as “Cultural and spiritual values of biodiversity”, an addendum to the Global Biodiversity Assessment highlights the central importance of cultural and spiritual values in the appreciation and preservation of all life and argues that these values give us a true reflection.

- participation in cultural life and access to cultural assets and resources in all their diversity.
4. In advocating for the integration of culture within development policies and programmes, it should be clearly understood that “no one may invoke cultural diversity to infringe upon human rights guaranteed by international law, nor to limit their scope”, as stated in the Universal Declaration on Cultural Diversity⁴⁰, adopted by UNESCO in 2001 . Notably concerning gender equality, the dynamic and transformative nature of culture, constantly evolving in relation to the environment and societal needs, acts as an enabler to allow women “to find paths through which we may view tradition with new eyes, in such a way that it will not violate our rights and restore dignity to ... women... [and] change those traditions which diminish our dignity”⁴¹. The inclusion of a gender perspective in analyses of the intersections of culture, conflict, communication and technology will help to accelerate the achievement of sustainable development.
 5. Acknowledging diversity, thus, should not be understood to imply raising barriers between communities and genders, but on the contrary it should mean promoting the capabilities of individuals, both women and men, in addressing the issues of poverty, not just in terms of material conditions and incomes, but also in terms of capabilities and opportunities, notably in respect to access to culture.
 6. For all the preceding reasons, it is critical that the Post-2015 Agenda integrates culture as a key element within its goals, targets and indicators. These can be based on a growing wealth of data and statistics resulting from research as well as operational activities, notably through the implementation of UNESCO’s cultural Conventions as well as the application of culture-specific indicators⁴² and other facts and documentation which provide tangible evidence of the qualitative and quantitative contribution of culture to the various dimensions of sustainable development. This has crucial importance to support evidence-based policy making in the field of culture, and to inform government policies on trade, industry practices, systems of incentives and the rights of creators.
 7. United Nations common policies, practices and vision should be shaped in relation to culture and its importance for sustainable development, through joint programming and a continued exchange of experiences.
 8. In the development of Sustainable Development Goals (SDGs), therefore, culture should be placed as the fourth pillar of sustainable development. This would assist in securing the implementation of a human rights-based approach to development that is inclusive of cultural rights.

C. Incorporating culture into the post-2015 development agenda

1. Different opportunities exist for incorporating culture into the post-2015 development agenda, as a recognised enabler for sustainable development.
2. At a fundamental level, because culture is inherently a cross-cutting issue, a culture-sensitive approach should be an overarching concern for all development initiatives, on a par with human rights, equity and sustainability. A reference to culture, thus, should be included in the appropriate place within the future architecture of the sustainable

⁴⁰ Accessible online at: <http://www2.ohchr.org/english/law/diversity.htm>

⁴¹ The Report of the Special Rapporteur, Farida Shaheed, in the Note by the Secretary-General on Cultural Right (A/67/287), August 2012.

⁴² The UNESCO Culture for Development Indicator Suite is a pioneering research and advocacy initiative that aims to establish a set of indicators highlighting how culture contributes to development at national level fostering economic growth, and helping individuals and communities to expand their life choices and adapt to change.

- development framework and clear guidance and monitoring mechanisms should be established to ensure the implementation of the related principles.
3. Within individual goals related to the various dimensions of sustainable development, moreover, it will be important to identify every opportunity to reflect the contribution of culture as a sector of activity. These should find their way as appropriate at the level of targets and indicators.
 4. Such targets and indicators may refer, by way of example, to green jobs generated within the culture sector, benefitting in particular women and the youth in poor urban communities; to the reduction in CO₂ emissions associated to urban conservation programmes; to the securing of water, food and livelihood and the protection of biodiversity through the safeguarding of and synergy between traditional knowledge and skills in managing natural resources and the state-of-the-art scientific knowledge; or to the strengthening of the resilience of communities and mitigation of climate change thanks to investments in cultural initiatives and the maintenance of their natural and historic built environment according to traditional and sustainable practices.
 5. Many more opportunities exist, including in areas such as human rights, peace and security and education, which should be articulated explicitly through dialogue and consultations, with particular attention paid to those which may be associated to clear indicators and accessible data. In this regard, particular consideration should be given to the UNESCO cultural Conventions and their processes.
 6. It is also conceivable to reflect on the possibility of a self-standing sustainable development goal focussed on culture, to further highlight one of the specific contributions of culture to sustainable development, particularly in regard to “inclusive social development”. This is the area where the intrinsic value of culture is more often acknowledged, as already recognized in the text of the report “Realizing the Future We Want for All”⁴³, prepared in 2012 for the Secretary-General by the UN Task Team on the Post-2015 Development Agenda.
 7. This proposed sustainable development goal would aim at enlarging people’s capability to “lead the lives they have reason to value” through full participation in cultural life and access to cultures in all their diversity.
 8. Culture’s contributions to an inclusive social development and human wellbeing include:
 - a. Fostering the right and freedom of people “to be and to live what they choose”, i.e. to define themselves in society and more fully realize their aspirations;
 - b. A sense of belonging, to be part of a community and maintain close links to one’s roots and lands, with which many people identify, especially indigenous peoples⁴⁴, in advocating for ‘development with culture and identity’;
 - c. An environment conducive to tolerance and mutual understanding where diversities are acknowledged and respected;
 - d. The pleasure of living in a beautiful place and an environment at the human scale;
 - e. The deep connection with a major source of inspiration and spring for creativity;
 - f. The opportunity that cultural heritage offers, as a common good to be shared and protected, to build a cohesive society where people contribute their time and resources to the general interest. Culture, in this respect, would be an “entry point” for social cooperation which could bring people together around shared interests, strengthen their bonds and increase the “social capital” of a community.
 9. Achieving this proposed goal would require respect for cultural diversity, safeguarding heritage (tangible, intangible, cultural and natural), fostering cultural institutions,

⁴³ Op. cit., p. 24, para. 71.

⁴⁴ The objectives of the Second International Decade of the World’s Indigenous People (A/RES/59/174) point to development frameworks to be more culturally sensitive and relevant for indigenous peoples.

- building dynamic creative sector and strengthening cultural and creative industries on the basis of intellectual property protection, and promoting equitable cultural tourism.
10. In its implementation, the above goal would incorporate the fundamental principles referred to in the report “Realizing the Future We Want for All”, that is, human rights (notably cultural rights), reducing inequalities and promoting sustainability, while addressing human security (by fostering dialogue and mutual understanding) and reinforcing the commitment to international cooperation.

D. Strengthening multi-stakeholder collaboration and building partnerships

1. The culture sector in general has been an important field for the development of public-private partnerships (PPPs) over recent years, with PPPs being implemented successfully in the areas of cultural infrastructures, museums, and urban development along with the transfer of technology, management capacity, and the exchange of experience. Fruitful PPP initiatives have contributed to the optimisation of resources and local development, have attracted private investors and incubated ventures, given the added value and opportunities that culture as an economic sector offers for financial and social corporate responsibility. The need to create enabling administrative and legal environments for such PPPs in the culture sector that will be respectful of local specificities, environmental sustainability, and ethical principles should be more widely recognised by policy-makers, stakeholders and actors in sustainable development.
2. Long-lasting commitment from the private sector, through their corporate social responsibility actions in the field of culture, could also stimulate economic development and social welfare of their workforce, local communities and society at large.
3. Strong public-private partnerships are needed to facilitate growth in the creative sector. In terms of intellectual property assets, while the public sector puts in place systems that would support their management and exploitation, the private sector contributes necessary resources needed to make cultural activities/products profitable. The International Music Registry (IMR) is an example of a collaborative process involving the worldwide music sector with WIPO as a facilitator. It aims to facilitate licensing in the digital environment by providing faster, easier and simpler access to reliable information about musical works and sound recordings throughout the world.⁴⁵

V. An enabling environment for transformative change in society towards sustainable development through STI and culture

Transformative change towards sustainable development is impossible without an adequate enabling environment at local, national, regional and global levels. Such environment and associated incentive structures need to be framed in a sustainability context with ecological, economic and social considerations. As sustainable development entails pursuing a multitude of objectives and country situations differ greatly, in practice policy makers are faced with resolving trade-offs and building on synergies. Furthermore, their decisions are not independent from each other, but form part of a global system. Bottlenecks, disincentives and inconsistencies abound and are difficult to remove, as they are often a result of addressing other important problems. In addition, some argue that the policy space of decision-makers especially in poorer countries has

⁴⁵ <http://www.internationalmusicregistry.org/portal/en/index.html>

become increasingly limited. Against this background, this section highlights a number of salient elements of the enabling environment at global, regional and national levels.

A. National level

a) Improved coordination among multiple actors providing technical advice and assistance

In the late 1990s, culture was included in only 30% of United Nations Development Assistance Frameworks (UNDAFs), but since then the place of culture in national and international aid programming has steadily increased, reaching 70% inclusion by January 2012. This positive trend has been visible across regions between 2006 and 2008 thus demonstrating a strong demand from Member States for culturally-sensitive approaches and culture-related programmes conducive to sustainable development. Culture entries linked to social and economic development themes together account for 55% of the total, 12% relate to gender equality and 10% relate to human rights and rule of law. Overall, Culture is also now strongly associated with all thematic areas of the UNDAFs, which clearly anchors culture in the main development areas identified to date in view of the Post-2015 Agenda.

The contribution of the culture sector and culture-related projects to sustainable development needs to be further recognised by policy-makers, especially when it comes to resource allocations in national budgets to culture-related institutions and ministries, notably in developing countries. The integration of culture into National Development Plans, thus increasing the opportunities for capacity-building and training at national level and through efforts led by UN country teams in a cross-sectoral and interdisciplinary manner, would lead to more dynamic cultural sectors, generating multiple benefits for societies and diverse constituencies.

The development of culture-related indicators and statistics will help evaluate its contribution to a number of development dimensions, thus strengthening advocacy for the integration of culture into broader economic and social strategies in future National Development Plans. It will also help analyse the potential of culture in national and international markets and address inequalities through structural study and analysis.

Developing countries should be supported in their efforts to strengthen trade policy and national capacity development further to expand the growing contribution of creative industries to international trade through linkage 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 should recognise this need and act upon it, paying particular attention to women entrepreneurs and small- and medium-enterprises.

b) Good governance of STI: accountability, transparency, and open access

In order for science and technology to truly interface with society and policy and yield the intended results of economic and sustainable development, it is important to have the appropriate mechanisms in place to facilitate an enabling national environment. To this end, accountable and transparent governance structures with clearly articulated national sustainable development goals in line with international sustainable development goals must be in place.

National strategies for STI systems, must not only describe roles, institutions, mechanisms and processes for national STI development but must be cross-sectoral and interdisciplinary in nature

linking knowledge systems to main industries and to sectors such as health, agriculture, energy, industry and technology. Based on STI national strategies, action plans with defined goals, activities and timelines must be articulated so that governments and citizens clearly understand how STI can contribute to the advancement of knowledge, inform decisions both at a professional and private level, encourage sustainable lifestyles, drive economic growth and provide opportunities for youth employment and social inclusion.

Open access to scientific information, through the use of ICTs is an important factor in developing scientific capacity in countries in transition and in both developing and developed countries.

With the rapid transformation of human societies, the complex, multi-scale and interconnected economic, environmental and social challenges, and the increasing access to internet and mobile communication technologies, the strengthening of linkages between science, policy and society is becoming increasingly important. Decision and policy makers must understand better how science can contribute to sound decision and policy making and scientists must understand the societal issues and challenges which the decision and policy makers face. Scientific advisory systems to governments and parliaments are essential in this area as well as the availability of national scientific assessments. Increasing the number of politicians with scientific backgrounds has been cited as a crucial factor in paving the way for STI to become more central to the preoccupations of governments.

Effective STI systems are strengthened by good public understanding of, and engagement with science. Through the development of e-science, citizens are becoming more important as agents in the scientific endeavour, not only participating in the collect of scientific information but also in defining the research agenda. Public and private investment in science museums and centres, and print and electronic media popularizing science all contribute to a culture of science in society. It is increasingly being recognized that there is a need to bring scientists and journalists together in the emerging movement of establishing science media centres and to train journalist on reporting on specific STI topics. Science is also a universal language and powerful tool for social inclusion.

c) Quality science and engineering education

Education is one of the most important factors for improving the absorptive capacity and enabling environment. The development of effective STI systems is underpinned by national policies encouraging investment in quality science education at all academic levels, and specialized education, training and capacity-building in areas of emerging technologies and their applications, such as in the life sciences. Sustained human and institutional capacity-building is a key building block to the development of powerful STI national systems whether through home-grown measures or through international scientific cooperation.

Education policies need to comprehensively address the wide range of challenges from providing universal quality education for all, to entrepreneurial competences in curricula of secondary and vocational schools, to encouraging careers in natural sciences and engineering, to high quality doctoral and post-doctoral programmes, and to supporting life-long learning.

d) Valuing traditional and local knowledge

An enabling environment for STI system to promote social transformation includes recognizing and valuing traditional and local knowledge. Traditional knowledge is closely interconnected with and inter-dependent on bio-resources, landscapes, cultural and spiritual values and customary laws and can contribute in a significant way to developing sound STI policies and to

the development of culturally-sensitive social transformation and sustainable development. The traditional knowledge possessed by indigenous women should be even further protected and valued, especially with reference to sustainable development, environmental protection, food production and health.

e) Improving measurement of STI

Metrics are required to assess innovation and related policy performance, in order to support the global debate, guide policies and highlight good practices. Yet, measuring innovation is a moving target. The definition of innovation is no longer restricted to R&D laboratories and to scientific papers, but includes social innovations and business model innovations.

It is becoming therefore increasingly important to be able to effectively measure the development of STI and its impact on industry and society. Policy- and decision-makers as well as international organizations have responded by designing varied instruments and indicators through which the impact of STI can be monitored and analysed. UNESCO has responded to the need to better measure and monitor STI through its Science, Technology and Innovation Global Assessment Programme (STIGAP). Through STIGAP, UNESCO will work to enrich conventional STI monitoring systems by adding a bottom-up approach designed to fill in the gaps in the global assessment of STI. STIGAP will strive to broaden the scope and dialogue on STI data collection to come up with more relevant and country-specific data that will not only better enable countries to make more informed decisions on the development of STI, but will also facilitate a finer assessment of STI at the international, regional and national levels and expand STI monitoring and its relevancy by including countries that have less developed STI policies and monitoring systems. The STI studies and information generated by STIGAP and by other sources will, in turn, be made available on the Global Observatory of Science, Technology and Innovation Policy (GO→SPIN) platform. (GO→SPIN) is a revolutionary cluster of databases equipped with powerful graphic and analytical tools which has the potential to be the first global observatory on STI policies that could provide end-users with structural information on STI national systems, descriptions of STI national priorities and goals, STI legal frameworks texts, STI operational policy instruments, international cooperation strategies, long-term temporal series of indicators on STI, innovation surveys, gender, economy, energy, environment, governance and social issues.

UNESCO Institute for Statistics (UIS) is the primary source for cross-nationally comparable statistics on education, science and technology, culture, and communication for more than 200 countries and territories. Moreover, *UNESCO's Science Report* provides an overview of the status of investment in STI around the world and contribute to a common understanding and benchmarking, which is very useful for national governments in informing their strategies for STI development.

B. Regional Level

Cultural cooperation fosters the integration of regions through knowledge transfer and mutually beneficial economic and policy agreements. Some regional entities have successfully integrated culture into regional economic and policy debates and key policy/cooperation framework documents and recommendations⁴⁶. Such intraregional collaboration is beneficial not only for facilitating the circulation of cultural goods, the networking of professionals (artisans and artists),

⁴⁶ The Economic Community of Central Africa adopted a policy of integrating culture into their common strategic direction at the occasion of a regional meeting in November in Yaoundé, Cameroon.

and the development of market chains and opportunities for mutual learning, but it can also nurture a culture of peace and cohabitation, through grass-root ties and networking.

South-South cooperation, especially on technology transfer

South- South cooperation is based on the premise that countries with similar socio-economic conditions are able to share their experiences and support each other in their development efforts. It allows developing countries to share knowledge, skills, expertise and resources through joint efforts. South-South cooperation provides a platform through which countries can share local knowledge and innovation and exchange ideas about ways in which they can address common challenges.

These efforts can result in the development of collaborative programmes in capacity building for scientific education and research, and to establish new regional alliances among academia, governments and industries to address real-life problems. Human resources development and joint research and training partnerships in STEM subjects could be one of the priority areas that would facilitate technology and knowledge transfer through south-south cooperation. This can be done by co-sponsoring the studies and research of young scientists or encouraging joint programmes through partnerships with Universities. An example of this is the UNITWIN/UNESCO Chairs Programme consists of the establishment of UNESCO Chairs and UNITWIN Networks in higher education institutions. This UNESCO programme is an example of building the capacity of higher education and research institutions through the exchange of knowledge, in a spirit of international solidarity

C. International level

International cooperation is another critical factor for the latecomer to expand learning and catch-up possibilities. For many least developed countries (LDCs) and Small Island Developing States (SIDS) that do not possess a minimal technological base to start or advance in the catch-up process, external assistance may be required to enable them to establish a minimum technological platform from which the process is initiated. The initial success of the catch-up would make it possible for a country – LDCs, SIDS and otherwise -- to climb up the ladder in the global technological hierarchy and eventually to participate in the generation of new technology. But international cooperation is also required in relation enhancing the governance of the global intellectual property regime.

The international community also contributes to creating an enabling environment for transformative change by supporting knowledge-sharing among countries on innovations in, or resulting from, the evolution of science and technology.

Recent interagency cooperation and programming in culture and development projects has contributed to the development of living laboratories that can ‘Deliver as One’, building on the comparative advantage of each agency, while at the same time promoting the integration of culture-related consideration and actions into the different UN agencies’ programmes. In order to optimise the contribution of culture to sustainable development and in response to the General Assembly’s request in Resolution 65/166, 17 United Nations organisations have responded by reporting their actions in terms that are in line with the Resolution⁴⁷.

⁴⁷ Culture and Development: note by the Secretary-General (A/66/187), 2011. The participating bodies were UNDP, the Development Operations Coordination Office, UNIDO, WTO, WB, IFAD, WIPO, FAO, UNEP, UNCTAD, UNITAR, UNOPS, UNAIDS, UNHCR, UN-Habitat, UNFPA, UNV.

The measurement of development that does not rely simply on economic GDP should be promoted internationally in order to integrate human and social dimensions of development, as well as quality of life into the evaluation of sustainable development goals.

The ratification of culture-related conventions is also an important benchmark as this can accelerate global cooperation in the field of culture by promoting technical assistance, collaboration and standard-setting, in the safeguarding of cultural and natural heritage, intangible aspects of culture, the flourishing of creativity and the protection of cultural property worldwide. Furthermore, such ratification contributes to sustainable economic development of the country or region from a cultural point of view, and strengthens both national identity, open-mindedness and respect for cultural diversity, which constitutes a precious equilibrium in the face of contemporary globalization. Ratification also ensures social and cultural continuity between past, present, and future generations.

Knowledge-sharing and awareness at all levels of actions concerning culture and sustainable development should be promoted, in order to accelerate cross-border learning and embrace a broader range of stakeholders.

VI. Recommendations

A. National level

Member States should:

- Design and implement comprehensive national STI development strategies, plans and policies, reflecting their cross-cutting nature, and encompassing sectors such as health, agriculture, energy, education and industry.
- Promote the up-to-date and rigorous science-based decision-making and application of scientific advancements for the benefits of society by inter alia, enhancing the interface between science, policy and society and establishing scientific advisory systems to support evidence-based decision-making processes.
- Promote policies and programmes that strengthen science education in particular by encouraging STEM education of girls, career development of scientists and researchers and STI driven entrepreneurial activities for young women and men.
- Build capacities in science education and the popularization of science that engages citizens and lay people in science and scientific research and reinforces the interrelation between science and society.
- Build resilient societies by educating at-risk communities concerning risk prevention, preparedness and mitigation.
- Consider creating incentives for R&D and innovation through tax policies, subsidies, or more innovative models such as competitions and prizes.
- Strengthen multi-stakeholder collaborative approaches and build partnerships for the creation of knowledge, technology and innovation for sustainable development, involving scientific entities, the private sector, NGOs, philanthropies and local communities
- Considering the life-cycle of technologies, implement policies and programmes promoting knowledge production, dissemination and utilization, as well as the development and appropriation of technologies within productive sectors.

- Promote creativity and an enabling environment for science and innovation that raise awareness and emphasize the crucial role of STI in addressing sustainable development challenges.
- Develop national infrastructure, governing structures, and legal frameworks to harness the important potential of ICTs for sustainable development and ensure its inclusiveness.
- Implement adequate policies for opening innovation ecosystems to marginalized social groups, including indigenous peoples, while accounting for local ownership and a fair sharing of benefits.
- Ensure enhanced access at all levels of government to scientific information and data, critical for advancing research and innovation.
- Promote at all levels a culture-sensitive and inclusive approach to the development of public social policies and provision of social services, especially in the areas of education and health.
- Monitor and counter risks associated with STI policies, such as uneven access to technology, environmental non-sustainability, security and privacy issues;

(Culture-related recommendations)

- Consider establishing the mapping of national cultural assets, and assess their potential to contributing to sustainable development;
- Promote the development of culture-related indicators and statistics at national level, based on agreed frameworks such as the UNESCO Culture and Development Indicators Suite⁴⁸, which will help evaluate culture's qualitative and quantitative contribution to a number of development dimensions;
- Implement national development strategies aimed at harnessing the potential of cultural industries for inclusive social and economic development through adequate regulation, facilitation of access to global value chains, and capacity building by placing particular emphasis on women entrepreneurs, marginalised groups and small- and medium- size enterprises;
- Integrate principles of context-based and culture-aware approaches in all domains of national policy relating to development, such as economy, education, gender and social inclusion, health, and environment;
- Promote the integration of culture in United Nations Development Assistance Frameworks (UNDAFs), in order to prioritise culturally-sensitive approaches, culture-related programmes, as well as legal and governance frameworks to harness the potential of culture for sustainable development;
- Increase opportunities for capacity-building and training at national level in the culture sector, notably through efforts led by UN country teams in a cross-sectoral and interdisciplinary manner, and targeting diverse constituencies;
- Sensitise various ministries, public and private sectors and policy-makers about the contribution of the culture sector and culture-related projects to sustainable development, and ensure appropriate budget allocation to culture-related institutions and ministries, notably in developing countries.

B. Regional level

Member States should:

⁴⁸ <http://www.unesco.org/new/en/culture/themes/cultural-diversity/diversity-of-cultural-expressions/programmes/culture-for-development-indicators/>

- Harness the benefits of South-South and triangular cooperation for sharing best practices of STI-policies, transferring technology and knowledge, as well as establish innovation ecosystems.
- Support data collection, monitoring and assessment initiatives at regional level to facilitate regional cooperation mechanisms and frameworks for evidence-based and peaceful management of transboundary waters, as well as for other transboundary environmental assets.
- Scale up or develop STI centers of excellence and R&D capacity-building hubs.
- Promote access by developing countries to existing and new technologies and the development of their own technological capabilities.
- Foster regional initiatives for improving access to modern infrastructure, especially in the areas of transportation, water, ICT and sustainable energy.
- Use science diplomacy as a tool for the addressing sustainable development challenges promoting of peace.

(Culture-related recommendations)

- Foster cultural cooperation frameworks at regional level for knowledge transfer and mutually beneficial economic and policy agreements, which will facilitate not only the intraregional economic growth in the field of culture and exchange of experiences, but also intercultural dialogue.

C. Global level

Governments should:

- Establish a universal mechanism for assessing and monitoring the contribution of STI to sustainable development.
- Develop a global mechanism for STI for sustainable development that encompasses the following:
 - Strengthen international scientific collaboration to address global challenges and inform policy-makers accordingly.
 - Promote world-wide mobility of researchers, STI professionals and graduate students by reducing regulatory barriers and creating an enabling environment for collaboration among higher education institutions and business.
 - The definition of STI related goals and their inclusion in the post-2015 development agenda (i.e. water, sanitation, health, food security, agriculture, social inclusion, good governance, oceans, education, disaster risk reduction and energy).
 - Such goals could include STI education and capacity-building, quadrupling global technology performance, universal access to sustainable technology, and the establishment of a global green innovation system for sustainable development.
 - Developing a global mechanism to enable technological advances and their dissemination on a global scale, in particular in developing countries.
 - Supporting the development of a web based platform on up-to-date scientific knowledge relevant to sustainable development, to inform decision-making and to strengthen the science-policy interface.
 - Supporting science diplomacy related efforts to promote peace and sustainable development, as well as a tool for the prevention of conflicts.
- Promote ethical principles to guide STI.
- Expand open access to scientific knowledge and ensure the free flow of information as a

- fundamental principle for bridging the knowledge gaps.
- Promote the development of relevant, international comparable STI indicators aligned with peace, inclusiveness and sustainability and the building up of a global database of green STI policy instruments.
 - Develop tools for guidance on policy assessment methodologies for climate change adaptation, emphasizing its social dimensions and taking due account of the potential contribution of environmental ethics to project evaluation.
 - Tailor the IP system so as to promote technology dissemination and the protection of knowledge of indigenous communities.
 - Further promote the transfer of technologies through a range of policies, regulations and international treaties. In this regard, the technology-related benefits of FDI must be taken into consideration.

(Culture-related recommendations)

- Include sensitivity to cultural context as one of the fundamental principles which will guide the post-2015 development agenda, together with human rights, equality and sustainability;
- While building upon universal values, reflect culture and cultural diversity in the post - 2015 development agenda;
- Incorporate consideration of culture both as an enabler and driver of sustainable development into all sustainable development goals as appropriate, notably at the level of their targets and indicators;
- Give due consideration to the possible inclusion, within the post-2015 development agenda, of a specific sustainable development goal focused on culture, concentrating in particular on the specific contribution of culture to an inclusive social development;
- Develop appropriate governance at global level for the effective integration of culture in sustainable development policies and programmes, including appropriate coordination, guidance and a monitoring system;
- Further promote knowledge sharing and awareness at all levels of actors concerning culture and sustainable development in order to accelerate cross-border learning and capacity-building, and enhance a broader range of stakeholders through the ratification of culture-related global conventions and international cooperation.
- ECOSOC should better guide programme development and policy direction on STI and culture as parts of the post-2015 development framework using its expertise, knowledge resources and convening power.
- Clearly include the role of STI policies and systems in the Sustainable Development Goals and the post-2015 Development Agenda.