Science and Technology for Rio+20

ICSU-UNESCO

Rio+20 Regional Science and Technology Workshops

ICSU

International Council for Science

UNESCO

United Nations
Educational, Scientific and
Cultural Organization

Asia and the Pacific

Africa

Latin America and the Caribbean

Arab States

Europe and North America

www.icsu.org/rio20/regional-workshops

Background

The concept of sustainable development brings together economic, social and environmental challenges, developed and developing countries, governments, businesses and civil society, scientific knowledge and public policy, and present and future generations. It has created the awareness that the environment and social and economic development are facets of the same agenda.

The United Nations Rio+20 Conference will take place 20–22 June 2012, in Rio de Janeiro, Brazil.

Coming 20 years after the original Earth Summit in Rio de Janeiro, and 10 years after the 2002 World Summit on Sustainable Development in Johannesburg, Rio+20 (also known more formally as the United Nations Conference on Sustainable Development 2012) will bring together high-level policy-makers from across the world. The aim is to secure renewed political commitment to sustainable development, to assess the progress to date and the remaining gaps in the implementation of the sustainable development agenda, and to address new and emerging challenges.

The ICSU-UNESCO Regional Workshops

ICSU and UNESCO recognised the need to enhance the input from the science, technology and innovation (STI) community into the Rio+20 process, and to account for region-specific priorities and concerns. ICSU and UNESCO therefore organised five regional science and technology workshops in 2011 (for Asia and the Pacific, Latin America and the Caribbean (LAC), Africa, the Arab States, and Europe and North America).

Participants at the Regional Workshops

Each workshop had between 40–80 participants, primarily coming from countries in the region. Participants were made up of:

- Natural scientists, social scientists and engineers, including young scientists and engineers;
- High-level policy-makers/ government representatives;
- Representatives of civil society ('Major Groups' in UN terminology), including business and industry, farmers and indigenous peoples;
- Co-sponsors.

Results and Recommendations

The workshops were designed to provide input for the five Rio+20 intergovernmental Regional Preparatory Meetings (RPMs) being held in the run up to the Rio+20 Conference by the five regional UN Economic and Social Commissions (ECA, ESCWA, ESCAP, ECE, ECLAC) in their respective regions. The results and recommendations of the workshops have now been presented by our delegations at these meetings, and have informed ICSU and UNESCO's inputs for the Rio+20 Conference.

Aims of the Regional Workshops

- To give natural scientists, social scientist and engineers from the different regions the opportunity to prepare joint positions and concerted input for the Rio+20 RPMs, in collaboration with policy-makers and other key actors.
- To provide a platform for a science-policy dialogue at the regional level.
- To provide a platform for a multi-stakeholder dialogue with other 'Major Groups' (civil society stakeholders), including business and industry.

Overall Objectives of the Regional Workshops

- To ensure that the best available natural and social science is integrated into policy recommendations resulting from the RPMs and Rio+20.
- To incorporate specific regional concerns and priorities into the global agenda of Rio+20.
- To identify where support is needed by the STI community, at national and regional levels.
- To highlight the major contributions from STI to sustainable development.
- To identify the roles of civil society and the private sector in STI activities at regional, national and local scales, and their needs from the STI community.

Duration and Agendas

Each regional workshop lasted three days, with keynote presentations, plenary discussions and break-out group sessions.

The workshops addressed the main themes of Rio+20:

- Green Economy in the context of sustainable development and poverty eradication;
- the institutional framework for sustainable development.

The workshops also assessed new and emerging challenges and priority issues.

Organisers

The regional workshops were jointly organised by ICSU's and UNESCO's regional offices, except the Europe and North America workshop which was organised by the European Group of ICSU National Members. All workshops were held in cooperation with the World Federation of Engineering Organizations (WFEO), the International Social Science Council (ISSC) and regional stakeholders.

Additional Information

For additional information on the regional workshops, including:

- reports and recommendations
- agendas
- participants lists

see: **www.icsu.org/rio20/regional-workshops**

Contact:

- Gisbert Glaser (ICSU Senior Advisor): gisbert.glaser@icsu.org
- Alice Abreu (ICSU's Rio+20 Regional Coordinator): alice.abreu@icsu.org
- Peter Bates (ICSU Science Officer): peter.bates@icsu.org

Overarching Recommendations and Key Issues

The participants at the five regional workshops asserted the importance of such regional meetings for the STI community, their commitment to STI for sustainable development, and their aspirations for Rio+20.

The following overarching recommendations and key issues were highlighted during the discussions in all of the regions:

- The Rio+20 outcome must be commensurate with the urgent need to move humanity to a sustainable path of development.

- Human induced global environmental change is occurring at an increasing rate and intensity across all regions. Fundamental changes in the human drivers affecting the Earth system and actions to enhance the resilience and decrease the vulnerability of human communities are essential.

- Current economic patterns are responsible for many of the interlinked and growing social, environmental and economic crises unfolding across all regions. Economic sustainability, human development, poverty eradication and environmental sustainability must be addressed in an integrated fashion.

- The last 20 years have seen at best incremental movements towards sustainable development. Renewed global political commitment to sustainable development is vital.

- Concrete and challenging targets should be set that can be translated into international and national law.

- The natural sciences, social sciences, humanities, engineering and technology communities have a fundamental role to play in developing systems of knowledge, defining targets, implementing solutions and monitoring progress for sustainable development.

- Commitments are needed to large-scale investments in targeted transdisciplinary research that addresses the integrated environmental, social and economic pillars of sustainable development. Social and technological innovations for sustainability should be the goal.

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- Strengthening science-policy links at national, regional and global levels is essential in efforts to improve the institutional framework for sustainable development. Science advisory mechanisms should be built into all levels of decision making, at national, regional and global scales.

- Targeted capacity building is needed within the scientific community, with a focus on developing countries and gender equality issues.

- The scientific and technological community must improve cooperation with other parts of civil society, the private sector, governments and intergovernmental bodies. Research agendas should be defined through broad-based, participatory approaches involving those in need of scientific information.

- It is important to work closely with local communities and indigenous peoples when planning research activities, development interventions or education programmes, to account for their specific cultures and knowledge.

- Formal, informal and non-formal education should be recognised as key mechanisms in addressing sustainable development issues for the medium and long term, and they should have a strong science-base.

- **Rio+20 is a forum at which governments should recognise, enhance and map out the crucial relationship between policy-making and science, technology and innovation.**

- **Rio+20 should be a fundamental milestone in the development of a new contract between science and society.**

Asia and the Pacific

16 – 18 April 2011, Kuala Lumpur, Malaysia

www.icsu.org/rio20/regional-workshops/asia-pacific

Organised by ICSU's Regional Office for Asia and the Pacific, and the UNESCO Regional Science Bureau for Asia and the Pacific in Jakarta.

Alongside the Overarching Recommendations, the following recommendations are among those highlighted by the scientific and technological community from the Asia and the Pacific region during the three-day workshop in Kuala Lumpur, Malaysia:

Sustainable development and Green Economy

The Asia and the Pacific region, with more than half of the world's population and two thirds of the world's poor, has a major stake in sustainable development and poverty alleviation. Its rapid growth in economic output and its rapidly growing share of global scientific research put it in a good position to achieve these goals.

The people of the region, and indeed all people on the Earth, face **two major challenges**:

1. The continued use of the Earth and its ecosystem as if it were an infinite source of resources and a boundless sink for our waste.

2. Resources are used in such a way that many people of the Earth, and especially in Asia and the Pacific, continue to live in extreme poverty.

The connection between the Green Economy and **poverty alleviation** is not automatic. It must be consciously articulated and implemented.

Action to move to sustainable development will require **changes in social values and practices**, as well as technical solutions.

The construction of an appropriate **sustainable development index** that will become the true measure of development is a matter of high priority. This index should take into account environmental, social and economic indicators.

Scientific data and information are central to understanding environmental change and for monitoring societal progress towards sustainable development. Natural science, social science and technology therefore have a vital role to play in the success of the Rio+20 process. Achieving this requires **financial and political support**.

More public **funding support for Green Economy research and development (R&D)** is vital, but it needs to be applied strategically.

Members of the scientific community need to have **freedom in the conduct of science**, need to carry out and disseminate their research responsibly, and need to be accountable for their work. This is especially important in respect to science relating to sustainable development. Responsible and ethical conduct of research is an important requirement of scientists in their contract with society.

The lack of public and political awareness of dealing with risk and uncertainty is one of the features behind a **lack of trust of science**. Outreach and educational campaigns must address risk and uncertainty and improve community understanding of them.

Public communication, raising awareness and the education of all stakeholders about the Green Economy and new and emerging challenges are an important responsibility of the scientific and technological community.

Industry must work in partnership with the natural sciences, social sciences and the technological community to make progress in the transition to sustainable development.

Women are key actors for delivering the concept and products of Green Economy and green technology into the family and society. A greater participation of women in the scientific and technological workforce should be encouraged. The views of women on population growth need to be heard and supported.

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Institutional framework for sustainable development

An **improved position of science and technology** in the hierarchy of international institutions and national governments is a necessary first step in giving science and technology a stronger focus in international discussions, dialogues and negotiations.

There is a great need to **improve inter-ministerial linkages and collaboration** in the national government, and between equivalent organisations in the international sphere. Institutions established to encourage and oversee the move to sustainable development need to cooperate and not compete.

The **collection and sharing of data**, information and knowledge is a major need of the STI community, and of governments at all levels. The many international institutions involved with sustainable development need to coordinate their data systems and make them compatible.

New and emerging challenges for Asia and the Pacific

Climate change, ecosystem change and over-utilisation of resources

- Previously recognised challenges, including climate change, ecosystem change and over utilisation of resources, have a heightened urgency because they have not been addressed.

Urbanisation

- Urbanisation is a particularly relevant challenge in the Asia and the Pacific region, as here the urban population is growing at more than twice the rate of the total population. In many cases urbanisation is leading to health problems and decreasing wellbeing.
- The STI community can help reduce urban ecological footprints by introducing ecologically sound technologies such as integrated water and waste management, by assisting in urban planning to reduce energy consumption, and studying and inf uencing social practices.

Sustainable energy

- Sustainable energy is key to sustainable development, and a sustainable and adequate energy supply is a major priority for the Asia and the Pacific region. Achieving this will require innovations in science and technology and changes in social practices. Natural science, social science, humanities, engineering and technology all therefore have a vital role to play in the delivery of sustainable energy.

Africa

The African scientific and technological community met over 3 days in Pretoria, South Africa. Alongside the Overarching Recommendations, other recommendations and priority issues from their discussions include:

Sustainable development and Green Economy

The design and provision of **market incentives and financing** will be important for promoting entrepreneurship and green projects, to levels that are needed to accelerate transition from 'brown' to 'green' economy.

The **STI base** should be improved at appropriate levels (artisans, mid-level and advanced levels) to support novel industrial operations that the targeted Green Economy requires in African countries.

Infrastructure to support STI and humanities research, such as research parks, technology incubation centres, library systems, data storage and transfer centres, internet systems and laboratory support systems, need to be established in greater numbers in Africa.

Financial support/lending institutions should be strengthened to **support local entrepreneurship and economy-of-scale projects** in key economic sectors in Africa such as agriculture, energy, transportation and municipal services.

Initiatives must have regional context and relevance to succeed, and should be designed to account for **indigenous knowledge systems** (IKS) of the African continent.

Specific systems should be implemented to ensure that **vulnerable groups** such as women, youth and the disabled are protected through their **socio-economic empowerment in Africa**.

Institutional framework for sustainable development

Considering that well-designed programmes can fail if not properly coordinated and monitored, efficient mechanisms should be established to ensure **good governance and accountability** in both the public and private sectors.

Africa has been the object of numerous **development policies and action plans** at all levels. These need to be analysed and harmonised, including: regulations/conventions, policies, market incentives, educational and research support systems, performance monitoring systems, and enforcement systems.

STI intellectual resources and facilities that are available within the African Continent should be identified, through the development and integration of databases and directories of African researchers and research-related organisations.

STI should be included as the primary engine of Green Economy development through the development and integration of **National Science and Technology Policies** (with adequate funding), and creation of **science advisory boards** to provide input into developments in every socio-economic sector.

Priority issues and emerging challenges for Africa:

Food security

- Land redistribution, transfer and acquisition have to be addressed if Africa is to benefit from the green (agricultural) revolution.
- Indigenous seed and crop varieties that are best-suited to African conditions need to be identified, and their production increased to meet food security needs.

Biodiversity and ecosystem loss

- Deforestation, including clearing of forests for other competing needs, is a key issue.

Climate change and security

- Africa should prepare itself for adaptation to, and mitigation of, the impacts of climate change, especially sea level rise along the coast of Africa, which could generate massive human migrations.

Water scarcity and use

- Africa should explore possibilities for alternative water resources such as groundwater, and application of STI in water harvesting methodologies in the face of climate change and increase in its population.

Energy crisis

- Africa's clean and renewable energy resources are enormous but there is a need for enhanced STI to effectively tap this resource.

Health security

- Africa bears the bulk of the global disease burden with the double tragedy imposed by emerging (e.g. hemorrhagic fevers) and re-emerging (e.g. TB, malaria) diseases. STI should be deployed to find solutions to these health challenges.

Natural and human-induced hazards and disasters

- Africa is prone to a wide variety of escalating natural and human-induced disasters such as droughts, flooding, tropical cyclones, pests and diseases. It is therefore important that Africa adopt cost-effective policies to lower associated risks and allocate appropriate resources to hazards and disaster mitigation and preparedness.

Desertification

- The advance of the Sahara southwards and spread of aridity in most parts of Africa calls for STI and IKS interventions to address desertification.

Human migration

- Due to slow economic growth and development in rural areas, there has been increased migration from rural to urban or coastal regions, thus over-stretching basic infrastructure in those areas, and increasing poverty and pollution.

The Africa regional workshop report is available in English, Portuguese and French

Latin America and the Caribbean

Representatives of the scientific and technological community from the Latin America and the Caribbean (LAC) region met in Mexico City, Mexico. Alongside the Overarching Recommendations, specific recommendations emerging from their discussions included:

Sustainable development and Green Economy

New or existing **institutions, research and training programmes, and funding mechanisms** should be created or modified to support multi and trans-disciplinary research in all fields of the natural, engineering and social sciences and humanities, recognising the full range of issues that need to be addressed for sustainable development and poverty eradication.

Policy and research on Green Economy should account for the full implications of a **transformation to a Green Economy** at all scales, including:

cultural, social, political and economic change; personal, institutional-governmental, systemic and structural change; and impacts on vulnerable communities.

Sustainable development indicators should be developed, including social, technical, engineering, exact science and natural science dimensions.

Investment is needed in higher education and especially in graduate studies to enhance research and development (R&D) capacities in LAC.

Institutional framework for sustainable development

Specific **mechanisms for providing STI advice** should be developed in countries region-wide. These should be integral to government departments, parliaments and their corresponding commissions, and the justice system.

More policy and advocacy-oriented research should be encouraged, with greater leadership from the scientific community in the implementation of solutions, and in communicating, advocating and awareness-raising.

Research on the science-policy interface should be increased, analysing the different cultures of decision-makers, media and science communication, among other issues related to social studies of science and technology, and

analysing successful and unsuccessful practices in the LAC region.

Multistakeholder consultation and decision-making fora could be established at the local, national and regional level for the definition of 'relevant' research programmes for sustainable development. This would include participation of groups from the scientific community, social movements, other civil society organisations and the government (including science advisors).

A global fund for STI for sustainable development could be established, with each nation contributing the equivalent of at least 1% of its national defence spending.

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Priority issues and emerging challenges for Latin America and the Caribbean

Biodiversity loss
- LAC offers rich terrestrial, marine, coastal and fresh water ecosystem functions and services, including highly diverse agro-ecosystems that contribute to global food security and abundant sources of fresh water.
- Reversing the rate of terrestrial, fresh water and marine biodiversity loss is crucial.
- Indigenous peoples should be recognised as key partners in biodiversity conservation, as they live in and protect many of the remaining biologically rich lands in LAC.

Managing hazardous wastes
- Managing hazardous wastes in all habitats (e.g. urban, industrial and agriculture areas located in temperate, subtropical and tropical areas) is essential, through the development of complete eco-toxicological approaches.

Climate change
- Climate change mitigation and adaptation capacities should be developed, recognising that richer nations have greater responsibility in mitigation while developing nations will require greater efforts in adaptation.

Natural disasters
- Due to its geological and meteorological characteristics and high rates of urbanisation the LAC region is susceptible to human life loss, population displacement and infrastructure damage due to natural disasters, such as earthquakes, tsunamis, landslides, volcanoes, hurricanes, storm surges and f oods.

- Building resilience to these natural risks (in the framework of climate change) and related human displacements is essential.

Urbanisation
- Rates of urbanisation in LAC are some of the highest in the world, constituting a major environmental and social challenge.
- A systemic approach to urbanisation should be developed, such as land use and territorial planning, including urban and peri-urban planning, based on continuous dialogue among all the stakeholders of society. This involves organising interdisciplinary teams for the development of social and biophysical indicators (of materials and energy f uxes).

Poverty eradication and cultural diversity
- The eradication of poverty is a major goal for the LAC region, especially for the poorest countries.
- The LAC region has high levels of cultural diversity, including large urban centres, indigenous communities, women farmers and diverse language groups – giving a challenge and an opportunity to develop an intercultural approach towards a more inclusive society.

Other challenges
- Developing clean energy sources and sustainable agriculture.

Arab States

Representatives of the STI community from the Arab States region met in Cairo, Egypt. Over 3 days of discussions, they developed recommendations for Rio+20. Alongside the Overarching Recommendations, specific recommendations included:

Sustainable development and Green Economy

The STI community within the Arab States strongly recommends a paradigm shift to coordinate and enhance the region's efforts towards a **knowledge-based economy** and sustainable development.

A coherent and long-term research agenda needs to be developed for sustainable development in the Arab States, containing a portfolio of projects. Decision-makers should support this and make full use of the results.

Elements of this research agenda include:

- Holistic, trans-disciplinary scientific approaches, which address the interconnections between environmental, social and economic issues.
- Solution-orientated scientific programmes that expressly serve community needs.
- Strategies to incentivise scientists to serve the public through applied, practical, market-based, pro-poor and relevant research.
- Participatory processes through which science agendas and projects are developed, implemented and communicated including all stakeholders in any particular society or region.

- Inclusion of indigenous, accumulated and implicit community knowledge and practices, through dialogue and research with local communities.

In order to carry out a comprehensive research agenda, **capacity building** is needed by the scientific community and different stakeholders, with a focus on women and vulnerable groups.

More **integration and communication** between research efforts is needed in the region, to connect individual projects and generate an accumulation of experience.

In addition to North-South knowledge and technology transfer, there is a need for enhanced **technology and knowledge transfer between Arab States**.

Solutions and technologies from outside of the region need to be **adapted to the environment and cultures** of the Arab States. This process can be an opportunity for capacity building in the region's scientific and technological communities, and for local end-users.

Institutional framework for sustainable development

A more inclusive **participatory approach to governance** is mandatory for an effective implementation of sustainable development policies in the Arab States, by **formally integrating civil society into decision-making**, and using new **communication technologies** to generate dialogue, inclusion and democracy.

The **benefits of sustainable development and science at all scales need to be better recognised** by the public and governments, and communicated more effectively by the STI community.

There is need for an emphasis on **citizenship rights to being scientifically informed**, so that the public can make informed decisions and participate in discussions on issues pertaining to new sciences and technologies.

Working more effectively with education ministries to **integrate the concept of sustainable development into curricula in schools and universities**, and attention to informal education programmes, will be crucial.

Priority issues and emerging challenges for the Arab States

Water security

- Water scarcity, quality and management are key issues.

- Innovative water management solutions should be generated and disseminated to address resource efficiency and conservation.

- Community-based water management agreements should be initiated to share quotas for water, including trans-boundary agreements, and community-based monitoring should be implemented.

- Water management policies should be improved, especially in the area of agriculture. Better and more efficient use should be made of irrigation, efficient drip irrigation should replace f ood, and drainage water should be reused.

- Regulation and enforcement of pollution prevention should be improved.

Food security, nutrition and safety

- Crop varieties that need less pesticides, less fertiliser and less water, and can adapt to climate change, should be developed or better utilised.

- Efficient and incentive-based sustainable agriculture should be promoted.

- Capacity building, education, training and extension services should be provided for farmers.

- Agro-food losses and waste need to be reduced throughout the Arab States, through improved post-harvest techniques, reuse of 'waste' products, and better storage and transport. There is a need to engage with agro-industry on this subject.

Energy security and improved access

- Investment and R&D should be increased in renewable and alternative sources of energy, noting the great potential of solar, wind and wave energy in the Arab States.

- International energy management standards should be adapted for the region, management strategies developed for energy efficiency and feed-in tariffs introduced to incentivise investment in renewable energy.

Natural disasters, climate change and conflicts over resources

- STI-based climate change and disaster adaptation and mitigation strategies should be integrated into countries' economic, social and governance systems and firmly embedded into domestic policy planning across the board.

Biodiversity

- Efforts towards the valuation of ecosystem services should be developed, enhanced and supported. Sustainable markets for natural resources (e.g. biodiversity and ecotourism) should be further enhanced.

- The management of protected areas should be improved.

- Education and awareness-raising programmes should be implemented for linking biodiversity to society.

- Recognising and working with community-based traditional knowledge of biodiversity is essential for more effective and inclusive conservation management.

Balanced rural-urban planning

- There should be a focus on urban planning and sustainable land use.

- Green building codes should be adapted to the region (e.g. lighting, cooling).

- Inclusive, small scale infrastructure solutions and services should be developed in rural areas to reduce rural-urban migration.

Europe and North America

12 – 14 October 2011, Helsinki, Finland

www.icsu.org/rio20/regional-workshops/europe

Organised by the Group of the European Members of ICSU, in cooperation with ICSU and UNESCO

Alongside the Overarching Recommendations, the following recommendations are among those highlighted by the STI community representatives from Europe and North America, during their workshop in Helsinki, Finland:

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Sustainable development and Green Economy

The principle of **common and differentiated global responsibility** of regions and countries should be applied in the search for fair and effective solutions to global challenges.

The '**Green Economy**' concept should provide a useful starting point for helping to achieve sustainable development, in particular through decarbonising consumption, reducing the other environmental impacts of consumption, and reducing consumption inequalities.

Sustainable market structures, supported by appropriate institutions and regulations, need to be created to better reflect the status and **value of natural capital** and ensure correct signals to socio-economic systems including information on scarcity, critical tipping points and tradeoffs.

Processes initiating social self-evolution and transformation should be encouraged by making the

consequences of **consumption patterns** visible and sustainability part of our shared culture.

A Green Economy needs effective **monitoring systems**, including the monitoring of societal change and the integration of social development objectives into the Green Economy agenda.

Goals, targets and indicators agreed at Rio+20 should sensitively account for the needs of **indigenous people**, and the special conditions characterising sensitive and vulnerable areas, such as the **Arctic and the Mediterranean**. Specific studies should be devoted to the analysis of conditions of local communities and their adaptation to global change.

Universal access to education is a necessary precondition for achieving sustainable development.

Institutional framework for sustainable development

All international institutions should have a **scientific advisory body** tasked with providing advice on sustainable development matters; all national governments should include scientists and science advisors in their delegations to international meetings relevant to sustainable development; and scientists and science advisors should be included in the early phases of the development of policies for sustainable development, so that they are based on the best, up-to-date scientific evidence.

Institutions and mechanisms that ensure comprehensive and independent **assessments and evaluations of policies**, based on the best available scientific knowledge, must be deployed. These should be available at all levels of governance, from the global to the local. The focus should be on participatory evaluations and assessments.

Participatory sustainability assessments should be carried out in order to contribute to timely and rational debate on emerging scientific questions and on new or emerging technologies such as nanotechnology, carbon capture and storage, and geo-engineering.

A research-based analysis of ways to **strengthen the role of global organisations for sustainable development** and the role of sustainable development in existing global organisations such as the WTO, World Bank and IMF should be carried out.

The Aarhus Convention of the United Nations Economic Commission for Europe (UN ECE) on **access to information, public participation in decision-making and access to justice in environmental matters** could be used as a model for the development of a global convention or regional conventions.

Priority issues and emerging challenges for Europe and North America

Consumption and population

- The most important emerging challenges for sustainable development are related to the unsustainable consumption of natural capital and the economic, social and environmental consequences of population growth and demographic change.

Interconnected issues

- Problems of waste, food, water and energy security, climate change and ocean acidification, greenhouse gas emissions, biodiversity loss, ecosystem degradation and loss of ecosystem services are symptoms of population issues and unsustainable consumption.

- These interconnected challenges must be tackled at the international, regional, national and local scale if progress in sustainable development is to be achieved.

- Research, technology and engineering focusing on recycling, efficient use of energy and natural resources, limits on agricultural land and the consequences of resource degradation should be increased.

Natural hazards

- Vulnerability to natural hazards is increased as a direct consequence of population migration and growth, and unsustainable consumption.

- More effort must be devoted to increasing resilience, with infrastructures, systems and technologies adapted to natural and anthropogenic hazards and climate change.

Food policy

- Food policy needs to be better addressed within the research community using transdisciplinary approaches. These issues will not be solved merely by technical solutions or by markets, but require innovative research and stakeholder dialogues.

- In particular the links between food security, climate change, energy production, conservation of biodiversity and water security have to be addressed in order to identify threats, trade-offs and solutions. Ethical aspects should also be explicitly recognised.

Urbanisation

- In the context of urbanisation and cities, planning for sustainable development has to be developed, recognising issues of population and lifestyle. The potential for lower carbon footprints, sustainable transportation and improved human wellbeing should be actively exploited.

About ICSU
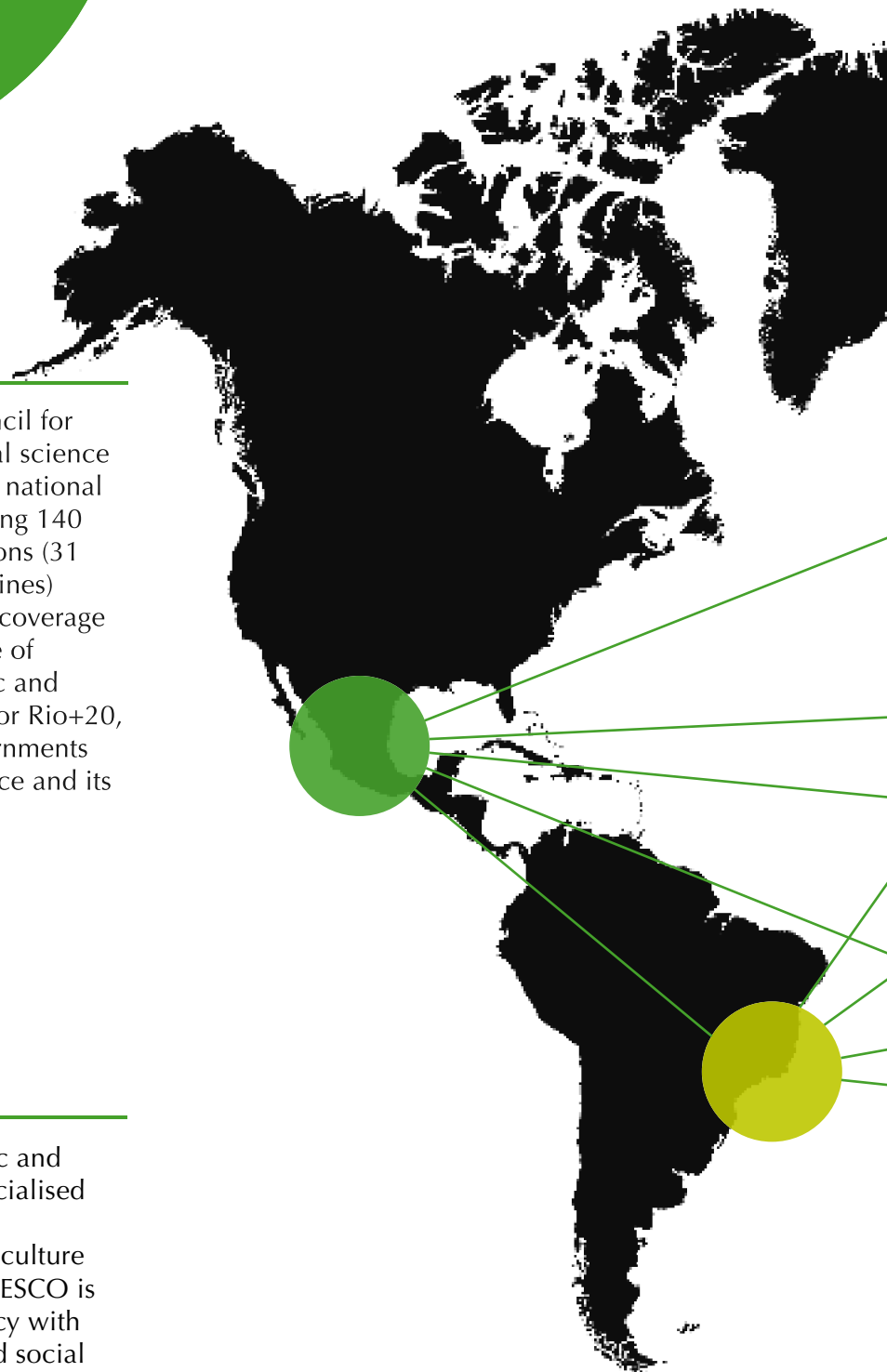# and UNESCO

ICSU
International Council for Science

The non-governmental International Council for Science (ICSU) represents the international science community. With a global membership of national scientific bodies (120 members representing 140 countries) and international scientific unions (31 members representing 31 different disciplines) ICSU is uniquely placed due to its global coverage and interdisciplinary breadth. ICSU is one of the co-organising partners of the Scientific and Technological Community Major Group for Rio+20, and therefore participates alongside governments and UN agencies in the Rio+20 Conference and its preparations.

www.icsu.org

UNESCO
United Nations
Educational, Scientific and
Cultural Organization

The United Nations Educational, Scientific and Cultural Organization (UNESCO) is a specialised UN agency with unique transdisciplinary competencies in education, the sciences, culture and communication and information. UNESCO is the only United Nations specialised agency with a specific mandate to promote natural and social sciences. It does this in close cooperation with its Member States and other partners throughout the world, in the interests of peace, human rights and development. Since its foundation in 1945 UNESCO has acted as a catalyst for the establishment of many, now leading, scientific unions and bodies; initiatives with far-reaching implications for sustainable human security and wellbeing.

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RIO+20
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