



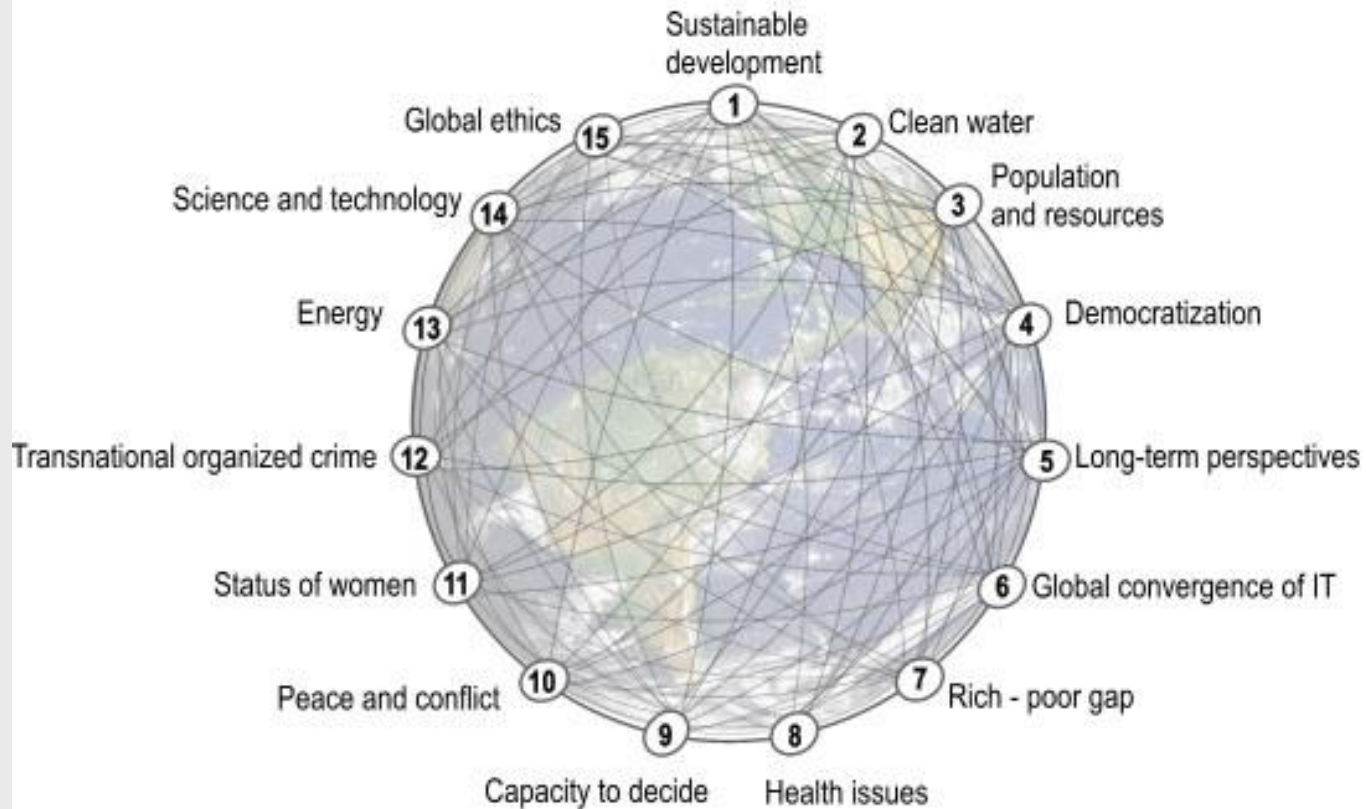
# **Status, challenges and new approaches to multinational science and technology co- operation**

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## 15 Global Challenges facing humanity



by the Millennium Project of WFUNA  
[www.millennium-project.org](http://www.millennium-project.org)



- ▶ A single nation will not be able to successfully address this kind of challenge
- ▶ Even uncoordinated/parallel attempts of a larger number of countries to address global challenges may not be successful or would at least be less successful than coordinated, cooperative efforts
- ▶ Single countries may not be willing to bear the costs of any attempt to address global challenges, if cooperation does not take place (prisoner's dilemma)



**Common need for collective action**



**Identical approaches of collective action to address global challenges**

## *Differences in the ...*

- **distribution of (expected) gains and losses**
- **number/complexity of factors relevant**
- **time horizon**

*... may ease or hinder collective action*



## Central hypothesis:

***Enhanced governance structures could increase the problem-solving-capacity of STI related to global challenges***

# Some characteristics of Science, Technology, Innovation (STI) related to Global Challenges



- ▶ Knowledge produced by STI may have the characteristics of a public good or public commons, but this is not always the case
- ▶ The complexity of global challenges necessitates interdisciplinary approaches of STI
- ▶ The global character of the challenges demands for international cooperation
- ▶ Cooperation between natural sciences and socio-economic research is necessary for adapting STI solutions to regional conditions

# Categories of knowledge related goods (global perspective)



	degree of rivalry = 0	degree of rivalry = 1
degree of excludability = 0	<p><b>public goods</b></p> <p>knowledge spill-over, published knowledge (also patented), basic research, data bases (open access)</p>	<p><b>knowledge commons</b></p> <p>human resources (university graduates etc.)</p>
degree of excludability = 1	<p><b>club goods</b></p> <p>data bases (restricted access), trade secrets, tacit knowledge</p>	<p><b>private goods</b></p> <p>patent protected technologies, R&amp;D staff of private enterprises, encryption</p>



## National policies

- ▶ *Science policies* aim at providing infrastructure for research and higher education with the main purpose of generating scientific knowledge.
- ▶ *Technology policies* are designed as technological missions in partnership with the private sector.
- ▶ *Innovation policies* focus on setting beneficial national infrastructure for private firms to generate technological innovation.

## Trends towards Globalization

- ▶ Transnational companies organize their STI activities globally and transmit innovations to other countries
- ▶ Innovation processes become more open
- ▶ Students, researchers and engineers are recruited on international/global markets
- ▶ International competition has increased within the research community, globalized standards for evaluating research evolve.
- ▶ Changing geography of STI relevant countries

# Global governance architecture for STI



Actors	
<b>International Organizations</b>	<p>United Nations (UN) General Assembly (GA) UN Commission of Science and Technology for Development (UNSTD) United Nations Educational, Scientific and Cultural Organization (UNESCO) United Nations Industrial Development Organization (UNIDO) United Nations Conference on Trade and Development (UNCTAD) United Nations Development Program (UNDP) World Intellectual Property Organization (WIPO) UN Economic and Social Council (ECOSOC) World Health Organization (WHO) Organisation of Economic Cooperation and Development (OECD) (multinational) International Energy Agency (IEA) (multinational) Intergovernmental Panel on Climate Change (IPCC)</p>
<b>International Regimes</b>	<p>World Trade Organization (WTO) Trade Related Aspects of International Property Rights (TRIPS) UN Convention on Biological Diversity (UNCBD) UN Framework Convention on Climate Change (UNFCCC) UN Convention to Combat of Desertification (UNCCD)</p>
<b>Global Funds</b>	<p>Global Environmental Facility (GEF) Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) UN Fund for Science and Technology for Development (UNFSCTD)</p>

# Global governance architecture for STI



<b>Global research networks</b>	UN Millennium Project Task Force on Science, Technology and Innovation, United Nations University (UNU) International Council for Science (ICSU) Inter Academy Council (IAC) Consultative Group on International Agricultural Research (CGIAR) Human Frontier Science Program (HFSP) Global Research Alliance (GRA)
<b>Club Governance</b>	G8 (e.g. Carnegie Group; Gleneagles-Dialog) G8-Outreach Processes
<b>Interregional Mechanisms of cooperation</b>	India, Brazil South Africa (IBSA) Trilateral Commission for Science and Technology G77 Consortium on Science, Technology and Innovation Technical Centre for Agricultural and Rural Cooperation, EU-AKP-Dialog on IPR
<b>Regional Integration</b>	EU-Framework Programs African Ministerial Council on Science and Technology (AMCOST) Association of Southeast Asian Nations (ASEAN) Science and Technology Network Multinational Cooperation Program of the Organization of American States (OAS) The Arab League Educational, Cultural and Scientific Organization (ALECSO)

# Common challenges for international STI cooperation to address Global Challenges



- Overcome political market failure
- Coping with transdisciplinary character of global challenge as well as systemic and non-linear ideas of innovation processes
- Lack of coordination efforts
- Lack of coherence between policies in different areas
- Uneven distribution of real or perceived gains of STI
- Access to data and technologies as well as their transfer particularly to developing countries

# Criteria to grasp the differences of existing Global Governance of STI



## Criteria to evaluate the global character:

- Number, regional scope and development stage of countries involved
- Historical process of integrating countries into the governance structure

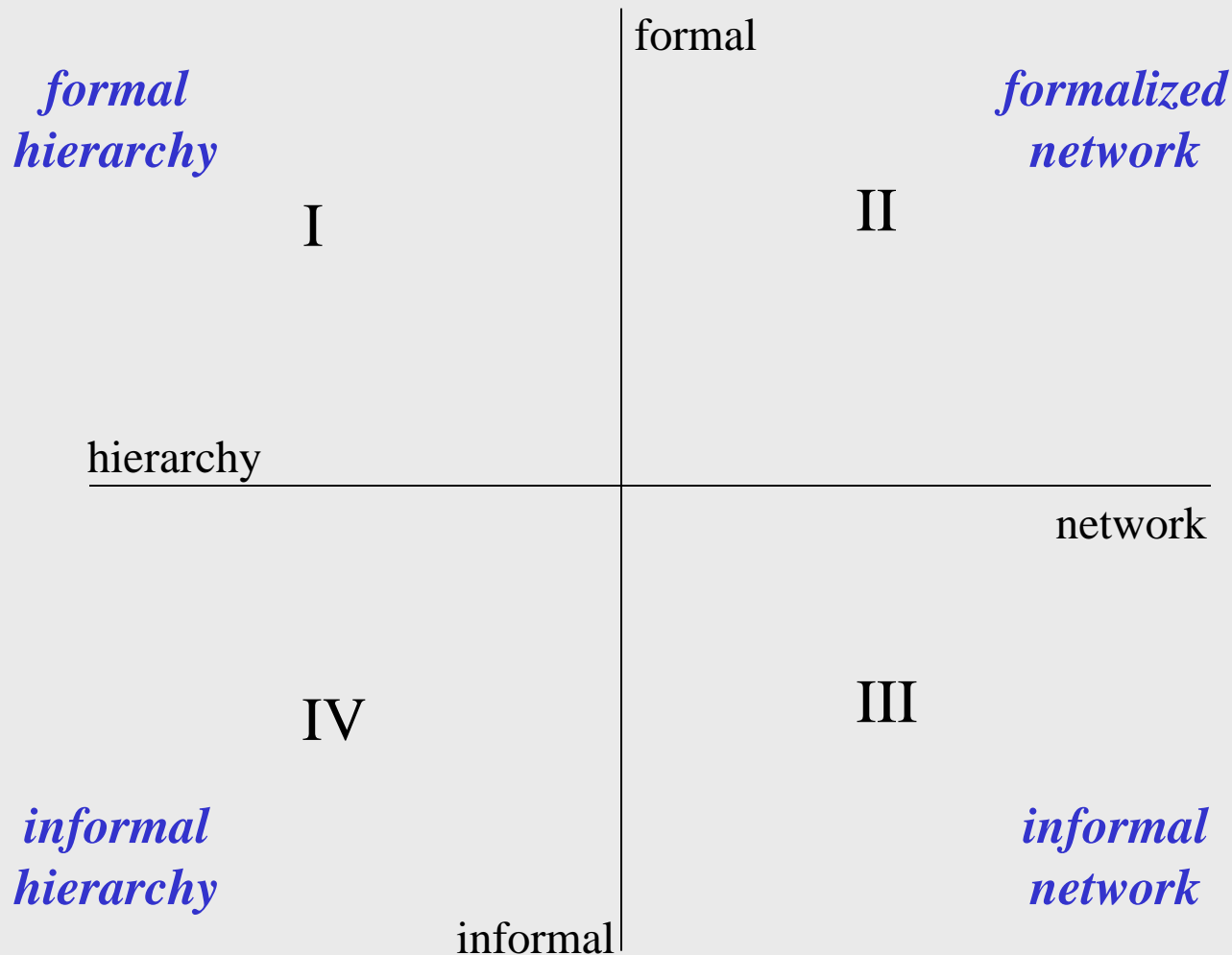
## Criteria to evaluate the institutional setup of global governance

- Decision making procedures and binding character of decisions
- Formalisation of global governance
- Institutionalization of global governance

## Criteria related to resource input and STI output

- Rules of financing of STI
- Type of STI activities supported
- Rules on IPR of STI results

# Institutional characteristics of existing Global Governance of STI





- ▶ Creating effective, inclusive and legitimate structures for research demand and agenda setting for STI policies at the global level
- ▶ Dividing the financial burden for provision of global public goods
- ▶ Encouraging STI policies for development
- ▶ Creating global funds for STI
- ▶ Providing access to knowledge and technology



**Thank you for your attention!**