Technology Evaluation:
A Critical Gap in Global Sustainable Development Architecture
A Submission to the NGLS Consultation
for the High-Level Panel on Global Sustainability
by ETC Group
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This paper responds to question 3(a) on the NGLS GSP civil society questionnaire.

What better policies and measures are required at national and international levels to put into practice the goals of the new development paradigm? These can be discussed generically, or in relation to particular sectors such as agriculture, forestry, extractives, services (including social/environmental services), manufacturing, water, energy, housing, etc..

A Deeper and Broader Consideration of Technology

The High-Level Panel on Global Sustainability has identified technology as one of four means by which a new vision for sustainability will be realized.[1] But the Panel must do more than assert that technology offers solutions or focus narrowly on facilitating the transfer of technologies. Some technologies will create new problems as they attempt to solve old ones. History is replete with examples of technologies gone wrong: lead added to gasoline, ozone-destroying chlorofluorocarbons, asbestos as fire-repellent, corn ethanol as a fossil fuel replacement, or thalidomide to alleviate morning sickness associated with pregnancy. The strict application of the precautionary principle (taking action to avoid likely harm) could have prevented these catastrophic failures. In some cases, technological solutions are being proposed for problems that are not technical in nature, but are fundamentally grounded in social and political injustice. Technologies intended to boost food production, for example, are frequently invoked as a response to global hunger, even in the face of food surpluses. Authentic public participation is crucial, especially the participation of those potentially most affected by technological "solutions."

A re-invigorated form of precautionary technology evaluation is garnering international support and was called for in, for example, the report of the 2008 *International Assessment of Agricultural Science and Technology for Development*:

> "Emerging technologies, including nanoscale technologies, require scientific, socioeconomic and societal evaluation in order for governments to make informed decisions about their risks and benefits. Rather than approaching technology assessment in a piecemeal, technology-by-technology fashion, governments and the international community could consider longer term strategies to address technology introduction on an ongoing basis. One option for the international community is to consider an independent body that is dedicated to assessing major new technologies and providing an early warning and early listening system. Another policy option could be the establishment of a legally-binding multilateral agreement on comparative technology assessment, potentially negotiated through a specialized agency such as UNCTAD, the ILO or ECOSOC's Commission on Sustainable Development…."[2]

In the area of agriculture, corporate control of key inputs via proprietary technologies has had negative impacts on peasants and small-scale producers who, still today, produce most of the world's food and feed most of the world's people – in addition to living relatively sustainably and nurturing biodiversity.[3] They do this in a policy environment that continues to favour big agribusiness – despite the well-known failures of the industrial agricultural system and a broad-based consensus that the direction agriculture has taken in the last 30 years must be radically altered in order to help resolve the food and climate crises. Consider the following:[4]

- 10 companies control 73% of the global commercial seed market
- 10 firms control 90% of the world market in pesticides
- A single firm (Walmart, the world's largest corporation) accounts for more than 10% of the global retail grocery sales of the top 100 firms
- More than 260 different "inventions" related to crops engineered to withstand climate-related stresses have been submitted to patent offices around the world for monopoly protection, mostly by six companies

The emergence and convergence of new technologies, including nanotechnology, synthetic biology, genomics and geoengineering, have made a deeper and broader consideration of technology more urgent.

Consider, for example:

- **Nanotechnology**, touted as a key technology for efficient solar cells, water cleanup and carbon sequestration, may also disrupt Southern economies and introduce new environmental threats. Nanotechnology has amassed more than $50 billion of public investment in the past decade and introduced at least 1600 product lines to the commercial market, even though some manufactured nanomaterials are now known to be toxic. There is uncertainty about the persistence of nanomaterials in the environment and about the impacts on workers' and consumers' health and safety. New nanomaterials that

could replace or compete with cotton, platinum, copper and other commodities could negatively affect some of the world's poorest and most resource-dependent economies.[5]

- **Synthetic biology,** which reengineers microbes as "living factories" to produce strategic commodities in vats or in crops, is being advanced as a source of next generation biofuels, 'green' plastics, pharmaceuticals and even food, as well as useful for water cleanup and nitrogen fixation. However, the commercial use of synthetic biology depends upon appropriating nature's biodiversity as "biomass" that can serve as feedstocks for the engineered microorganisms to convert cellulose into high-value products. Synthetic biology poses threats to the right to food, water and land and to the ecological integrity of ecosystems in tropical and subtropical countries where 86% of the world's biomass is located. Synthetic biology is also facilitating the proprietary production of natural compounds such as rubber, vanilla, liquorice and medicinal substances – a move that could drastically reduce or eliminate incomes for farmers and workers in the global South.

- **Genomics and metagenomics** are seen as key to the future development of environmental sciences and so-called "personalized medicine." It took 13 years and $3 billion to map the human genome, but it is now possible to map a complex genome in 8 days for less than $10,000 and – within a few years – to map any genome in 15 minutes for a few hundred dollars based on a single molecule. Meanwhile, the field of metagenomics is moving to access the genomes of entire communities or ecosystems in one fell swoop and preserve them in "libraries," a threat to indigenous peoples and to national sovereignty and opening a new area for financial speculation. The implications for biodiversity, "biopiracy" and the right to privacy are potentially devastating.

- **Geoengineering** – the intentional large-scale manipulation of the Earth's systems, including climate – is increasingly being touted as a viable "Plan B" in the face of inadequate action on climate change. The possibility of shooting sulphates into the stratosphere, whitening clouds to make them more reflective and changing the chemistry of our oceans is getting the attention of policymakers in Northern capitals. The Convention on Biological Diversity adopted a moratorium on such practices in 2010, but a more binding international mechanism to prohibit any non UN-sanctioned geoengineeirng is urgent.[6]

Nanotechnology, synthetic biology, genomics and geoengineering are not discreet inventions but technology platforms that demand whole production and/or processing systems. They are also untested and their applicability to national needs is speculative, and yet, the industrial and financial interests backing them will posit them as fundamental components of the Green Economy, attracting state subsidies and pushing for "enabling environments" (i.e., little or no regulation). The global South – which is bearing the brunt of environmental deterioration and climate change – will be the guinea pig for testing these powerful technological packages and the effects on indigenous, rural and marginalized peoples in the South will be submerged by the proverbial (and fictional) boat-raising tide. A fundamental component of technology transfer is the creation, by the United Nations, of a technology evaluation and information mechanism that strengthens national sovereignty and choice.

The absence of a multilateral institutional mechanism for technology evaluation and assessment – one that considers not only whether a technology functions, but also its human rights, social, environmental and unintended impacts, as well as the structures of ownership, control and diffusion – is a serious gap in our existing international sustainable development architecture. If such a body existed, it could assist national policymakers, strengthen sovereignty of countries to make their own technological decisions and play a critical information-sharing role. A more holistic and forward-looking approach would necessarily imply challenging existing intellectual monopolies on technologies that could contribute to diminishing the impacts of the climate or food crises. Even more importantly, it would provide an opportunity to scrutinize carefully, with foresight and with proper international and civil society oversight, high-risk, emerging technologies. Decisions about technologies should not be left to a narrow group of scientific experts or to technology boosters who may have a vested interest, but should involve the full participation of communities and peoples who could be affected. Traditional and indigenous technologies that are already time-tested, people-centered and resilient can serve as exemplars.

ETC Group is an international civil society organization. We address global socioeconomic and ecological issues surrounding new technologies with special concern for their impact on indigenous peoples, rural communities and biodiversity. We investigate ecological and cultural erosion, the violation of human rights, and we monitor the development of new technologies, including governance, corporate concentration and trade and investment. We operate at the global political level and have consultative status with several UN agencies and treaties. We work closely with civil society organizations and social movements, especially in Asia, Latin America and Africa. We have offices in Canada, Mexico, the Philippines and the USA. More information at www.etcgroup.org or etc@etcgroup.org

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ENDNOTES

[1] The others are markets, governance and gender equality. Presentation of President Harja Halonen of Finland to the UN General Assembly, New York, 16 March 2011.
[2] Beverly D. McIntyre et al., *Agriculture at the Crossroads: International assessment of agricultural knowledge, science and technology for development (IAASTD): global report*, Washington D.C., Island Press, 2009, p. 467 available at http://www.agassessment.org/reports/IAASTD/EN/Agriculture%20at%20a%20Crossroads_Global%20Report%20(English).pdf.
[3] See ETC Group, *Who will feed us? Questions for the food and climate crises,* 2009: http://www.etcgroup.org/en/node/4921.
[4] See ETC Group, *Capturing 'Climate Genes': Gene Giants Stockpile 'Climate-Ready' Patents*, 2010: http://www.etcgroup.org/upload/publication/pdf_file/FINAL_climate-readyComm_106_2010.pdf and *From Gene Giants to Biomassters: Hijacking the Green Economy and Consolidating Corporate Power,* forthcoming, April 2011.
[5] See ETC Group, *The Big Downturn? Nanogeopolitics* 2009 and *The potential impacts of nano-scale technologies on commodities*, a report prepared for the South Centre, Geneva, 2005: http://www.etcgroup.org/en/node/45.
[6] See ETC Group, *Geopiracy: The Case Against Geoengineering* (2nd edition), 2010: http://www.etcgroup.org/en/node/5217 and *What Does the UN Moratorium on Geoengineering Mean?* 11 November 2010: http://www.etcgroup.org/en/node/5236.