



Global Dialogue on Nanotechnology and the Poor: Opportunities and Risks

Environmental Law Institute
Symposium on

"Nanotechnology Governance: Environmental
Management from a Global Perspective"

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Meridian Institute helps people solve problems and make informed decisions about complex and controversial societal problems

Services

Multi-Party Problem Solving
Strategy Assessment and Planning
Leadership in the Theory and Practice of Collaboration

Issues

Science and Technology; Environment, Forestry, Natural Resources; Agriculture, Food Security, Biotechnology; Security; and Health

Scale

Local, national and international levels

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Meridian Institute Nanotechnology Projects

1. Nanotechnology and U.S. Federal Regulation (2003 – 2004)
2. Rockefeller Foundation Meetings (2003 and 2004)
3. International Dialogue on Responsible Research and Development of Nanotechnology (2004)
4. International Council on Nanotechnology (ICON), Inaugural Workshop (2004)
5. U.S. Environmental Protection Agency, Interim Ad Hoc Work Group on Nanoscale Materials (National Pollution Prevention and Toxics Advisory Committee) (2005)
6. International Risk Governance Council's (IRGC), Nanotechnology Project Workshop (2006)
7. Project on Emerging Nanotechnologies, NanoFrontiers Workshop (2006)
8. Global Dialogue on Nanotechnology and the Poor: Opportunities and Risks (2004 – Ongoing)

Descriptions at:

<http://www.meridian-nano.org/gdnp.php>

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Total worldwide R&D spending in 2005

Total worldwide R&D spending in 2005, USD9.6 billion up 10% from 2004	
government	USD4.6 billion, up 3% from 2004
corporate R&D	USD4.5 billion, up 18% from 2004
venture capital	USD497 million, up 17% from 2004

Products in the market: Nano incorporated into \$32 billion worth of manufactured goods in 2005.

Rush to patent: 500 nanotechnology patent applications in 1998; 1,300 in 2000; 3,966 U.S. patents issued since 1985.

Significant Developing Country Investments

China	USD230m 2000-2004
Brazil	USD25m 2004-2007
India	USD22.8m 2002-2007
South Africa	USD28m 2006-2008
Other developing countries investing in nano include: Mexico, Iran, Argentina, Chile, Costa Rica, South Korea, Malaysia, Philippines, Thailand.	

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Nanotechnology Could Benefit the Poor and Excluded

- The UN Millennium Development Goals (MDGs) are the world's time-bound and quantified targets for addressing extreme poverty in its many dimensions (income poverty, hunger, disease, lack of adequate shelter, and exclusion), while promoting gender equality, education, and environmental sustainability.
- Millennium Project Task Force on Science, Technology and Innovation identified nanotechnology as an enabling technology that can help meet MDGs. Examples of relevant applications of nanotechnology include:
 - **Water:** Effective water purification
 - **Energy:** Sustainable and cheap energy through advances in photovoltaic cells and energy storage
 - **Health:** New drugs, drug delivery methods and disease diagnostic test kits
 - **Agriculture:** Particle design to improve soil fertility and water retention; “smart” treatment delivery systems; etc.

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However, Concerns about Potential Risks and Other Issues

- **SwissRe** recommended that due to the absence of definitive knowledge the approach to the opportunities and risks must be worked out, the sooner and more comprehensive, the better.
- **Royal Society and Royal Academy of Engineering** suggested examination of the health, safety, environmental, social, ethical, and regulatory issues; and use of early warning programs.
- **ETC Group** recently renewed its call for a moratorium on nanoscience and technology, in the absence of agreed-upon safety standards and regulatory oversight.
- Concerns about nanotechnology and developing countries include:
 - **Public Health:** Toxicity for researchers, workers, general public.
 - **Environment:** Persistence, toxicity, bioaccumulation.
 - **Socio-Economic:** Social displacement? A “nanodivide” between rich and poor countries?
 - **Control:** Who owns the technology? What would be result of corporate control?
 - **Ethics:** Ethical implications of human enhancement and potential military and surveillance uses.
 - **Governance:** Lack of institutional capacity and resources to conduct risk assessments and set up regulatory regimes.

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Global Dialogue on Nanotechnology and the Poor: Opportunities and Risks

Meridian Institute and the Rockefeller Foundation identified the need for a global dialogue to:

1. make connections between nanotechnology and human development needs explicit; and
2. catalyze actions to ensure implications (pro and con) for the poor are addressed early.

Meridian established the GDNP with the following goals:

- **Raise awareness** about the implications of nanotechnology for the poor.
- **Close the gaps** within and between sectors of society to develop an action plan that addresses opportunities and risks, and
- Identify ways that science and technology can **play an appropriate role** in the development process.

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GDNP – A Range of Ongoing Activities (1)

- Generating **information**, raising awareness, and informing decisions:
 - A **paper** about the implications of nanotechnology for developing countries (January 2005)
 - An **online consultation** for people to share their own views and questions (January – March 2005)
 - **In-depth consultations** with experts in a range of disciplines ranging from nanoscience to rural development (October 2004 – Ongoing)
 - **Workshop facilitation and presentations** to meetings and conferences (October 2004 – Ongoing)
 - **Nanotechnology and Development News**. A free daily news service, available at: <http://www.merid.org/NDN> (December 2005 - Ongoing)
 - A **paper** on nanotechnology, water, and development (May 2006)

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GDP – A Range of Ongoing Activities (2)

- Organizing **multi-stakeholder discussions** to identify specific opportunities and risks, and catalyze action:
 - A multi-stakeholder **Steering Group meeting** to advise Meridian about the specific future activities (June 2005)
 - Multi-stakeholder **workshop on nanotechnology, water, and development** (late summer/fall 2006)
 - Multi-stakeholder **workshop on nanotechnology, commodities, and development** (winter 2006)
 - Global-level advisory group focused on “**Critical Connections**” (May 2006 – Ongoing)
 - Dialogue on issues of **global significance** (e.g., IP, governance) (TBD)
- Building **linkages** with national and regional activities, including:
 - **India**: The Energy and Resources Institute (TERI) project on Nanotechnology Governance in India
 - **Andean region**: Catholic University of Bolivia

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Nanotechnology Governance and Developing Countries

Given the rapid developments in nanotechnology in developed and developing countries, key governance issues include:

- Mechanisms to **identify nanotechnologies** that can help meet human development needs, and inform decision-making by R&D funders, including international development donors.
- The need to build **risk assessment** capacity, generate risk assessment information, and ensure access to global risk assessment information.
- The need for **risk management** policies and practices, in particular practices to prevent work force exposure to nanomaterials.
- The need to **engage non-traditional players** in international governance discussions (e.g., China and India).
- The need for **early warning and early listening** systems to assess the potential disruptiveness of nanotechnology for developing economies, including potential social displacement.

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Nanotechnology Governance and Developing Countries – Key Points

- Developing countries are **investing significant resources** in developing nanotechnology, and are already applying nanotechnologies to meet domestic human development needs (e.g., nano water filtration in South Africa).
- Developing and applying nanotechnologies relevant to human development needs is **not a “technology transfer” issue**.
- Future generations of nanotechnology are expected to be **more complex and powerful**, and raise new EH&S, social, and ethical questions.
- **New governance approaches are needed** to ensure responsible development of nanotechnology worldwide.

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Additional Resources

<http://www.meridian-nano.org>

- Information on all Meridian Institute nanotechnology projects, including GDNP papers, online consultation results, meeting summaries, and other background materials

<http://www.merid.org/NDN>

- Nanotechnology and Development News

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