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
Meridian Institute
Nanotechnology Projects

2. Rockefeller Foundation Meetings (2003 and 2004)

Descriptions at:
http://www.meridian-nano.org/gdnp.php

Total worldwide R&D spending in 2005

<table>
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<tr>
<th>Category</th>
<th>Spending</th>
<th>Change from 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>government</td>
<td>USD4.6 billion</td>
<td>up 3%</td>
</tr>
<tr>
<td>corporate R&amp;D</td>
<td>USD4.5 billion</td>
<td>up 18%</td>
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<tr>
<td>venture capital</td>
<td>USD497 million</td>
<td>up 17%</td>
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**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**

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

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.
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.

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)
  – A **paper** on nanotechnology, water, and development (May 2006)
GDNP – 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

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 workforce 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.
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