

Panel Inputs

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1. Technological frontiers span the smallest scale to largest scale.

- Nanomaterials bridge bulk materials with atomic or molecular structures (1-100 nm)
- Gene-level manipulation of plants and animals, including the human genome
- Space travel, mining and colonization

Information technologies enable and amplify all other technologies.

- “Literacy” now includes ability to manipulate computers as well as language and numbers.
- Increasing computer literacy should be linked to sustainable development objectives.

3. Impacts of automation for development, sustainability, SDG goals

- Development: water, food, energy, goods and services; jobs & income; health & education
- Sustainability: life support from water, soils, atmosphere, resources
- SDGs as system-level objectives
 - Need system-level conceptions
 - Roles of automation will vary by project

Ambitious demonstration projects with multiple objectives for SDGs

- Material outcomes
- Educational and training purposes
- Entrepreneurial empowerment
- Influence provided by institutional base
- Explicitly promote the public interest.

4. Scenarios for achieving sustainable development

- Supplement monitoring the present by analyzing scenarios about the future.
- **Sustainability** matters.
- Scenarios require specific, concrete objectives and identifying alternative ways to achieve them.

Promising alternatives need....

- Engagement of community
- Technical skills, entrepreneurs
- Institutional base to facilitate collaborations, confer legitimacy
- Deal with property rights, corruption
- Funding strategy.

9. Action: SDG demonstration projects with multiple strategic objectives

- Identify projects generalizable to categories of communities
- Build on existing strengths, community priorities
- New formats for funding and for public/private collaborations in the public interest
- Role for decentralized control, local entrepreneurship

Concrete goals, examples

- Integrated water systems: access, use, recovery and treatment for reuse
 - E.g., 3D printing of nano-membranes: nanotechnology, automation, water sciences
- Electrification
 - Great appeal (vs. latrines)
 - Choice of system geared to community

Global institutional challenges

- Counterbalance turning inward in Europe, US
- Include systematic study of safety of demonstration projects (e.g., nano-membranes)
- Innovative curriculum development
 - Technology, economics, sustainability, entrepreneurship, finance
 - Learning by doing.
