



Roundtable on Science and
Technology for Sustainability
Annual Meeting

June 15, 2004



1. Roundtable's Charge to the Task Force

Roundtable emphasized S&T's central role in sustainable development (2003 Annual Meeting)

Task Force created to explore linkage between knowledge and action for sustainability

- Connect research to needs of policymakers and information users
- Provide specific suggestions to the Roundtable
- Collaborate with and build on other related activities, both within or outside the National Academies



Task Force on Linking Knowledge to Action for Sustainable Development

William Clark, *Co-Chair*, Kennedy School of Government,
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2. Task Force Strategy

2.1 International perspectives on what sustainable development wants – and gets – from S&T *[Mexico City]*

2.2 Scholarship on international research systems (agriculture, health, energy, manufacturing) *[Harvard]*

2.3 User-producer interactions in decision support systems: experience with climate forecasts around world *[Irvine]*

2.4 Managing the linkage – learning from innovative cases in the federal agencies and private sector *[Washington]*

2.5 University approaches to sustainability science *[Temazón]*



3. Common Themes That Emerged From Task Force Activities

Task Force workshops entrained more than 60 scholars, managers, users from government, academic, and private sector positions around the world

Revealed great wealth of experience and insight, much of which specific to individual cases, countries, or sectors (see briefing book; full reports on the workshops will follow over coming months)

Nonetheless, several common themes emerged...



3.1 A persistent gap between knowledge and action

Gap between what decision makers want from S&T and what S&T is offering

Available knowledge is often not put to use and political support falters

⇒ Need to understand why this gap persists and what changes in institutions, procedures, and program design can help to bridge it

Examples: Engineers Without Borders, "saving the world one community at a time"



3.2 A great but untapped potential for learning from experience

Substantial word experience with knowledge systems

Lessons learned rarely developed as input into contemporary systems

⇒ Need to systematically and critically compare experience with knowledge systems across a wide range of sectors and regions

Example: NetTel@ Africa, alliances to build telecommunications capabilities in Africa



3.3 A need to foster user-producer interactions

In effective knowledge systems, the problem to be solved is defined in a collaborative but ultimately user-driven manner.

The collaborative dialogue of knowledge co-production must continue throughout the project, with both users' goals and scientists' R&D agendas changing in the process.

⇒ Need to foster institutions and procedures for initiating and sustaining user-producer dialogues

Example: International Research Institute for Climate Prediction (IRI) linking users, producers of ENSO forecasts



3.4 The importance of end-to-end systems linking knowledge to action

Successful programs involve end-to-end, integrated systems that connect basic scientific predictions or observations through several steps to outputs directly relevant for decision making.

→ Need “supply chain” perspectives on the design of decision support systems that assure no missing or mismatched links

Example: Houston Galveston Area clean air policy development, multiple stakeholder evaluation and conflict resolution



3.5 The value – and vulnerability – of bridging or boundary-spanning organizations

User-producer dialogues can be strained along the supply chain from basic research to decision making

Dialogues within science-based organizations often do not mesh with dialogues within operations or policy contexts

⇒ Need for boundary-spanning organizations and individuals to promote effective dialogues, with recognition of their value and vulnerability

Example: Community-Based Land Management (USGS, BLM, local and regional agencies), Tomales Bay (CA) Watershed Council



3.6 The importance of creating “safe spaces” for innovative risk taking

Efforts to link knowledge to action in support of sustainable development often involve radical institutional innovations.

⇒ Need “safe spaces” in which experimental innovations can be carried out and that protect innovators from hostile takeovers, encourage experimentation, and embrace errors as a learning device

Example: CDC Genotyping Network, exploring advanced analytic techniques for infectious disease management



3.7 The need for appropriate targets and metrics

Successfully targeting and sustaining programs linking knowledge to action for sustainability generally require a clear and readily understood statement of the beneficial outcomes that successful completion of the project would deliver.

⇒ Need a methodology that specifies goals, outcomes, deliverables and metrics, while encouraging the sort of innovative, experimental, high risk work that is central to mobilizing S&T for sustainability.

Example: Federal Government GRPA and PART Evaluations, need to develop interagency metrics



4. Possible Follow-up Tasks for the Roundtable

- 4.1 "S&T Peace Corps" for scientists, engineers
- 4.2 Awards/recognition program for innovative S&T "boundary spanners" in public and private sectors
- 4.3 Training (case-based short courses?) in design of effective S&T based decision-support systems
- 4.4 Fellows program for gov-univ-private exchanges
- 4.5 Incentive and measurement systems to support innovation programs linking knowledge to action
- 4.6 Empirical research on what works and why