

*WBC-INCO NET Meeting  
Skopje, 16-17 June 2009*

**Methodologies and guidelines  
for S&T priority setting  
Task 2.1**

Claire Nauwelaers - René Wintjes  
UNU-MERIT



UNITED NATIONS  
UNIVERSITY

UNU-MERIT

# Priority setting in S&T policy: for which purpose?

- ✓ **Prioritisation in science and technology policy:** the process of selection of thematic areas of research, which are seen as most relevant and important for the socio-economic and sustainable development of the country
- ✓ Why prioritise ? Because of:
  - **budgetary limitation:** need for **synergies** and **critical mass** in public research
  - Need to express **societal relevance** of certain research questions
- ✓ Purpose: **change** in direction and nature of research activity towards those activities with highest impact
- ✓ **Two-steps** process:
  - **national** priorities
  - **joint cross-border** priorities



UNITED NATIONS  
UNIVERSITY

UNU-MERIT

# Priority setting in S&T policy: with what consequences ? (1)

- ✓ Prioritisation in S&T of value if clearly ***linked to policies***
- ✓ ***Barriers***
  - Inertia in public funding systems
  - Lack of real policy commitment towards the priorities
  - Fragmentation in policy-making
  - Prioritisation purely reflecting current research specialisation and not oriented towards change
- ✓ ***Conditions for successful prioritisation exercise***
  - ✓ Presence of political commitment to implement consequences of prioritisation in actual policy-making
  - ✓ Consensus between various Ministries and Agencies in charge of policy implementation, to avoid competing priorities
  - ✓ Long term views on prioritisation



UNITED NATIONS  
UNIVERSITY

UNU-MERIT

# Priority setting in S&T policy: with what consequences ? (2)

- ✓ Thesis: the **quality of prioritisation** exercise will influence the likelihood of its impact on actual policy-making
  
- ✓ **Three types of impacts of prioritisation on policy-making**
  1. Thematic R&D programmes (targeted to public, or private R&D performers, of collaborative ventures), normally with a medium- or long-term perspective, and established on a competitive basis
  2. Structural funding for dedicated Public Research Organisations
  3. Selection of clusters or competitiveness poles



UNITED NATIONS  
UNIVERSITY

UNU-MERIT

# Priority setting in S&T policy: which rationales ?

## **Criteria** for selecting thematic R&D priorities

1. **STRENGTH:** Capitalising on existing research strengths, both in public and private research sectors, and on new developments suggesting possible opportunities;
  - ✓ Acknowledged research excellence
  - ✓ Internationally recognised researchers
  - ✓ Critical masses in research
2. **RELEVANCE:** Ensuring that research results are of highest value for general development of the country (economic, social, sustainable development):
  - ✓ Need for research-based solutions to societal needs;
  - ✓ Expected impact of new technologies on productivity growth;
  - ✓ Expected impact in industrial restructuring towards higher value-added activities.



UNITED NATIONS  
UNIVERSITY

UNU-MERIT

# Priority setting in S&T policy: how to define priorities ? (1)

Two types of methods:

- 1. *Quantitative and empirically-based*** approaches:  
measurement of national S&T strengths and weaknesses
  - 2. *Institutional*** approaches, setting up and use of formal and informal structures to determine priorities
- ✓ In practice, priority setting is often informal and influenced by lobby and individual interests
  - ✓ Thesis: ***the use of formalised methods of priority setting will contribute to a rise in quality of the prioritisation process, and to likelihood of policy implementation.***



UNITED NATIONS  
UNIVERSITY

UNU-MERIT

# Priority setting in S&T policy: how to define priorities?(2)

## 1. *Quantitative and empirically-based* approaches

### Assessing specialisation in **public research**

A *specialisation indicator* measures the relative position of a given research area in a country compared to an average

- ✓ Government Budget Appropriations or Outlays for R&D (GBOARD) by socio-economic objectives
- ✓ Expenditure on R&D in Higher Education by Field of Science

### Assessing strengths in **public research**

*Bibliometric* methods: best proxies for assessing research quality

- ✓ (Peer reviewed) Publications in journals, books: productivity of researchers, Specialisation indexes indicate critical masses in fields of research
- ✓ Co-publications: networking, opening up of domestic research capability
- ✓ Citations and impact factor: originality and value-added of research resulting in publications



UNITED NATIONS  
UNIVERSITY

UNU-MERIT

# Priority setting in S&T policy: how to define priorities ? (3)

## 1. *Quantitative and empirically-based* approaches

### Assessing specialisation in **private research**

A *private research specialisation indicator* measures the relative position of a given research area in a country compared to an average

- ✓ Business Enterprises R&D expenditures by sector (industrial class of principal sector activity)

### Assessing strengths in **private research**

Patent applications to the European Patent Office by technical fields can be used to compute *technological specialisation indexes*

Concordance matrix linking patent production in the various technical fields to industrial sectors where these patents may have economic relevance



UNITED NATIONS  
UNIVERSITY

UNU-MERIT

# Priority setting in S&T policy: how to define priorities ? (4)

## **2. *Institutional methods*** used to support prioritisation

Two most commonly used methods for priority setting  
based on consultative and participatory exercises:

- ✓ Use of existing Research and STI Councils
- ✓ Implementation of Foresight exercises



UNITED NATIONS  
UNIVERSITY

UNU-MERIT

# Priority setting in S&T policy: application for WBC INCO-NET

## **Goals:**

- **priority setting** for formulating promising or potential research themes and corresponding resource allocations
- **vision building** for clarifying shared interests and joint benefits of international collaboration
- **networking** for mobilising R&I communities in different countries

## **Two possible approaches:**

- ✓ **foresight-based approach:** detailed proposals, focus on identifying shared research interests amongst stakeholders, more marked mobilisation effect.
- ✓ **approach combining expert consultations and quantitative data analysis:** broader perspective, more geared towards identification of areas of research strengths



UNITED NATIONS  
UNIVERSITY

UNU-MERIT

# Priority setting in S&T policy: Key success factors

- *Openness, inclusiveness and **transparency** of consultation process: it is not « picking up the strongest voices »*
- *Evidence-based prioritisation (data on quantity and **quality** of research)*
- *Involving the **user-side**: it is not « scientists speaking for scientists » but a question of societal relevance*



UNITED NATIONS  
UNIVERSITY

UNU-MERIT