



International Workshop on The Comprehensive Review of the S&T Basic Plans in Japan

Comments for Concluding Plenary Session

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Taking stock

- Clear positive message from Basic Plans
 - Steady increase “high level” outputs in period of 1st and 2nd Plans
 - Dramatically expanded R&D investment
 - Continued reform of national S&T systems
- Landmark evaluation study
 - Nothing comparable for a country this size
 - Huge effort – important insights emerging
- In spirit of continuous improvement look for further lessons for policy and evaluation

Methodological Aspects of Input-Output Approach

- Per capita or per unit figures for publications & patents rely on correct denominator
 - May be over-estimate of researchers numbers and university investment
 - In any case “research productivity” is multi-dimensional concept depending upon capital (equipment) intensity of field etc
 - Danger of perverse incentives to overproduce
- Confusion of inputs and outputs
 - Numbers of researchers fostered through R&D investment
 - Acquired amount of competitive research funds
- Time lag – today’s outputs from accumulation of previous inputs

Other measurement issues

- International shares and comparisons need to take account of broadening East Asian capabilities
- Absolute amounts can miss important changes in other systems eg US skewing to defence and homeland security at expense of other fields
- Proper measure of competitive vs external funds

Implications

- Better approach in long run is to measure capacity and capabilities of the S&T system
 - Accumulation and maintenance of human resources, knowledge and infrastructure
- Input-output-outcome/impact relationships need clear understanding of model that links them
 - This model itself being transformed by reforms

S&T Personnel

- Achievement in numbers is positive but ...
- If desire is to achieve flexibility, mobility, openness and diversity, is casualisation of the workforce the right solution?
 - Present policy acts not on the rigid layers but on those underneath them
 - Competition among universities can also drive mobility – natural labour market
 - Presentation made clear that main barriers lie in employment, salary, working conditions and practices
- Matching training to need
 - By scientific specialisation
 - By broader capabilities to manage and apply research
- Mobility is key for
 - Knowledge transfer academia-industry-government
 - Interdisciplinarity
 - Participation in global scientific networks
- Need for whole system approach
 - Primary education to mid/late career retraining in situation of ageing population

Industry-academia-government cooperation

- Tendency for policy to address more formal aspects and to measure the measurable
- In practice linkages have 4 dimensions:
 - Flow of trained graduates (firms say most important)
 - Collaborative and contract research
 - Commercialisation of IPR
 - Informal networking and knowledge transfer
- First and last reach greatest number of companies but need more subtle policies to promote
 - US experience shows capacity building – people and culture/environment friendly to entrepreneurs
- Commercialisation can never be major income source
- Ultimate aim is ecology in which large firms act as base around which start-ups, universities, government labs, intermediaries etc are in well-defined mutually supportive roles

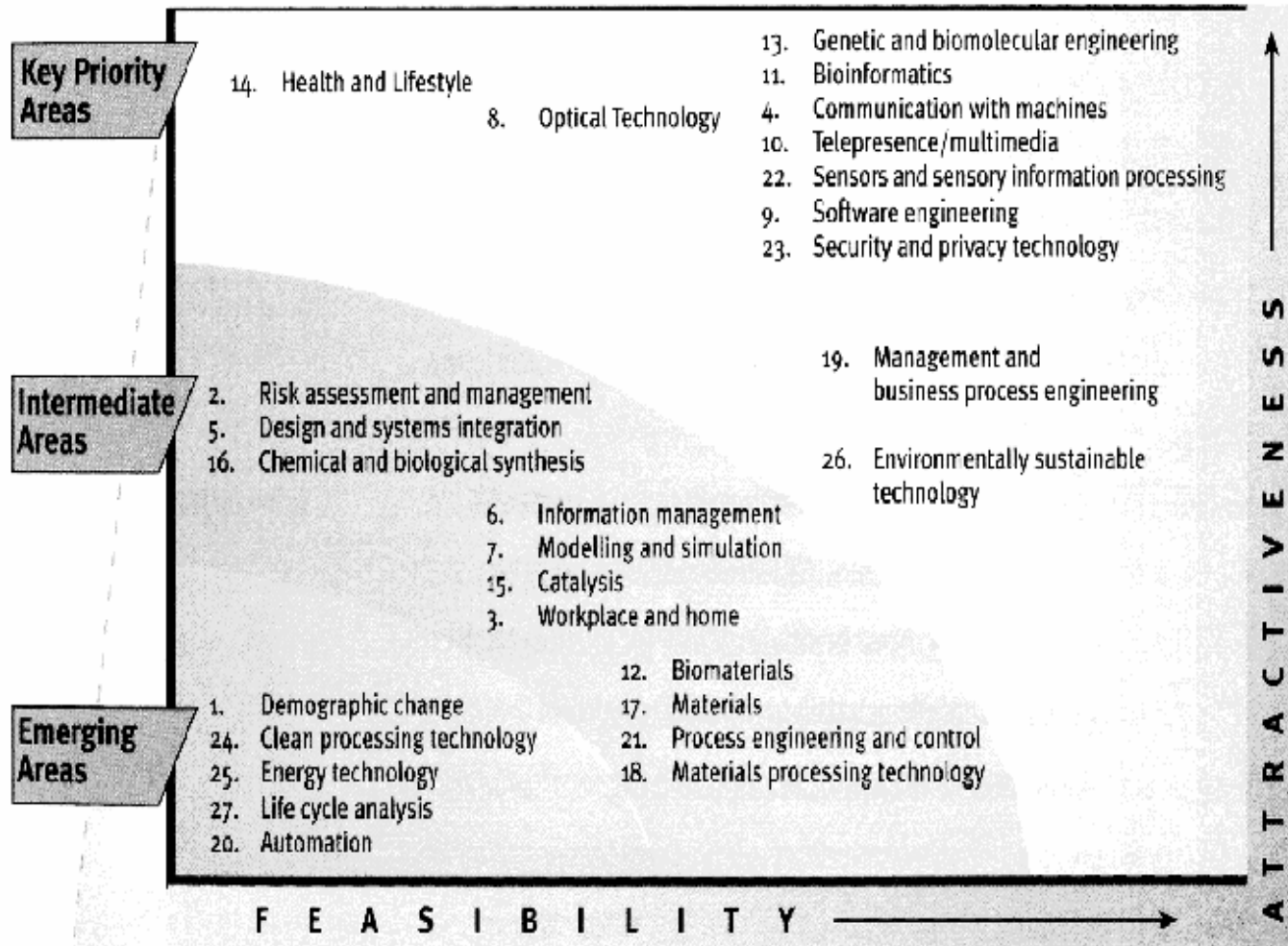
Regional innovation policy

- Substantial international variation in balance of power & resources between national and regional governments (and supra-national)
- Managing multi-level governance now a key aspect of innovation systems
- Regions also engage in international competition and benefit from international benchmarking
- Need for central government impetus
 - How can a region attract/make use of national facilities
 - Role of public and semi-public laboratories as bridges from research to SMEs
- What are success factors in cluster formation?
 - Knowledge versus sectoral or trading clusters
 - Need for clear vision of technology leaders
 - Effective networking functions
 - Supportive infrastructure for entrepreneurs

Prioritisation

- Note shift of resources to 4 priorities and increase in papers but not patents
- However, workshop shown both USA and EU more concentrated in these areas without explicit prioritisation policies
- How to prioritise?
- Vertical/Horizontal intersection proposed in table document
- Could move to explicit matrix approach cf 1st UK Foresight Programme
 - attractiveness/feasibility
 - however does not solve basic problems of prioritisation

Similar to 1st UK Foresight Programme Framework

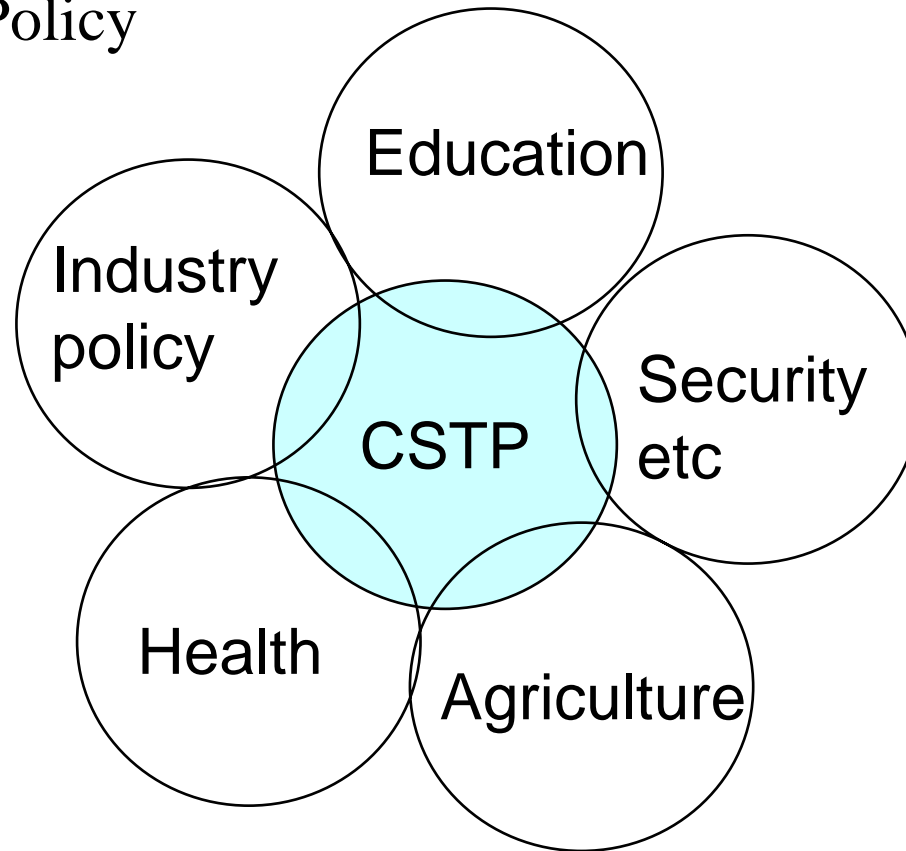


Risks of prioritisation

- Mis-identification
 - Which science falls under priority and which does not
 - Relabelling a possibility
- Inter-connection
 - Priority field may be heavily dependent upon field not explicitly prioritised eg mathematics
- Excessive or too general priorities
 - Stakeholder pressures mean resources dissipated
- Duplication
 - Tendency to follow international fashion rather than to consider in depth specific national needs leads to same list in all countries and regions

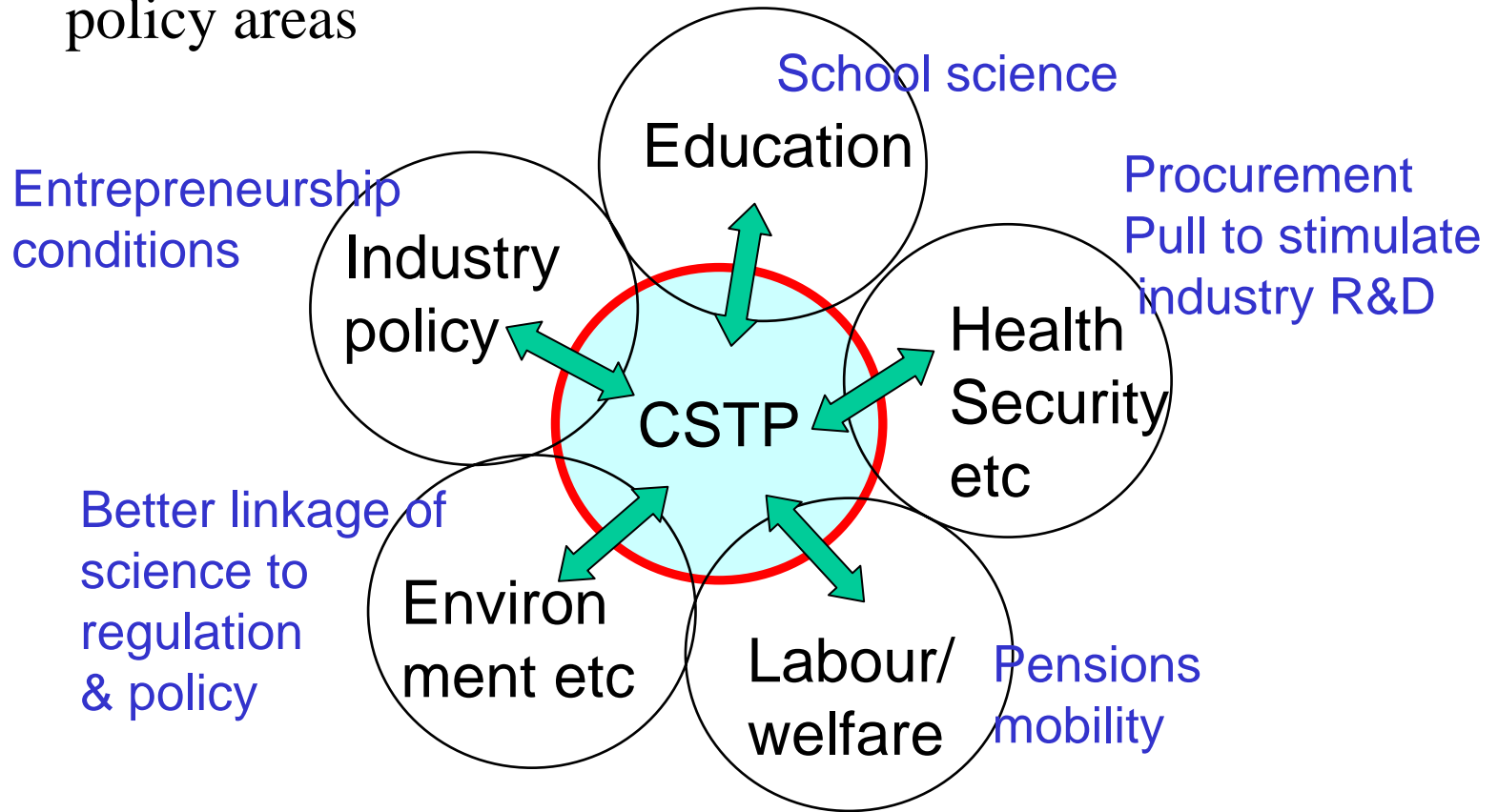
Conclusions – Policy coordination

Restructuring and Basic Plan Created Coordinated Science Policy



Conclusions – Policy coordination

Challenge for 3rd Plan to manage interface with other policy areas



University strategy

- Major barriers to continued progress now appear to lie inside institutions
- Approaching limit of reform possible through legislation
- Next phase will involve changes in organisational culture that can only come from within stimulated by changes to operating environment
- Create environment in which entrepreneurial universities have clear advantages so no moral hazard to be first to reform
- University strategic plan formation to be participative process with staff buy-in at all levels
- Build budgets and incentives around plan and reward against performance

Shifting emphasis

- Current policy emphasises resources and opportunities
- Need to shift emphasis to incentives and capabilities
- Incentives
 - Need to cascade from university and programme management to individual researchers at all levels
 - Eg success in research or commercialisation reflected in promotion, salary etc
 - Must be balanced incentives to ensure variety in system
- Capabilities
 - Management of S&T an integral part of scientific training
 - Professionalisation of interfaces (TLOs etc)

Conclusions

- Policy transfer is difficult because of embedded cultural and systemic features which may not be obvious
- S&T Policy needs to be set in framework of innovation policy and with clear interface to all other policy domains
- Research institutions must develop strategic capabilities and operate in cascaded incentive framework
- Second qualitative stage of Basic Plan evaluation very important to understand indicators
- International benchmarking provides one useful framework for evaluation but also a need for counterfactual
 - Exploration of effect of “no basic plan” hypothetical on Japan
 - Alternative approaches
- Ex ante evaluation of 3rd Basic Plan could revisit issues of rationale with emphasis on systemic approach