TFM IATT WS6 Curriculum revision

Group Session 2: Policy instruments definitions and design (part 2a)

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1. What is public policy?

Three mainstream definitions of "public policy," with references to key authors and texts are listed as follows.

1. Public Policy as the Distribution of Resources

- Definition: Public policy is "the authoritative allocation of values and resources in society, involving laws, regulations, and decisions that allocate benefits and costs to different sectors."

  Reference: David Easton, The Political System: An Inquiry into the State of Political Science (1953).

  - Easton defines public policy in the context of political systems theory, where it represents the distribution of societal values and resources through authoritative decisions.

2. Public Policy as a Decision-Making Process

- Definition: Public policy is "a complex process that involves the formulation, adoption, and implementation of government decisions aimed at influencing public issues."

  Reference: Thomas R. Dye, Understanding Public Policy, 15th Edition (2012).

  - Dye highlights the decision-making aspect of public policy and focuses on how policies are made by different actors within the governmental system.

3. Public Policy as Government Action

- Definition: Public policy is "a course of action or inaction chosen by public authorities to address a given problem or set of problems."

  Reference: James E. Anderson, Public Policymaking: An Introduction, 8th Edition (2014).

- Anderson emphasizes public policy as a purposeful governmental course of action to address societal issues.

4. Public Policy as Problem-Solving with Institutional Guidance

- **Definition**: Public policy is "an institutionalized proposal designed to address a central problem, guided by a particular conception, often through a systematic approach like the policy cycle."

  Reference: Antonio Lassance, *2020: Policy as an Institutionalized Proposal* (2020).

  - Lassance highlights the problem-solving nature of public policy, emphasizing its formulation within institutional frameworks and its strategic orientation towards solving societal problems through planned actions and regulations. This recent definition captures the evolving nature of public policy, integrating modern concerns like systematic processes and the role of institutions in guiding and addressing contemporary societal issues.

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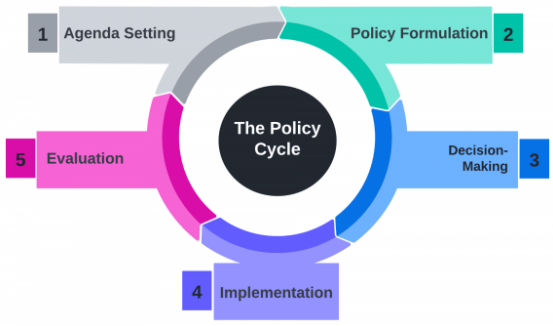
These definitions capture the multifaceted nature of public policy as both a governmental process and a tool for resource allocation. A summary definition of public policy may be:

> ***Public policy is the formulation and implementation of government decisions, laws, and regulations resulting in the allocation of benefits and costs to address a societal problem or change, all within the context of existing institutional frameworks and strategic policy orientations.***

2. The policy cycle



The policy cycle - Involved stakeholders:

Agenda setting: Gov't, academia, firms and industries, civil society

Policy formulation: Gov't, academia

Decision making: Politicians, Representatives, Parliamentarian

Implementation: All-of-gov't, local gov't, civil society

Evaluations: Gov't, academia, experts and educators

Moving away from linear approaches (even if we use the term "cycle" it is still a linear concept), can the policy cycle be seen as a systems interaction among stakeholders?

Stakeholders may be a broader set than policymakers, policy analysts and technocrats and evaluation and related experts, akin to NSI structure that includes firms, academia and civil society, and others.

3. Definitions of policy instruments

A policy instrument is a tool or mechanism used by governments or other organizations to implement their policies and achieve desired outcomes. These instruments are designed to guide or influence the behaviour of individuals, businesses, or other entities in a way that aligns with policy objectives. Often, a combination of different instruments is used to effectively address complex issues.

Well-known academics in the field of public policy and administration define policy instruments as follows.

1. **Lester M. Salamon** suggest a comprehensive definition in his work *The Tools of Government*. Salamon defines policy instruments as "**the means by which governments attempt to achieve their policy objectives**." He categorizes these instruments into a broad array of types, including direct government, government corporations, grants, loans, tax expenditures, regulations, and others, emphasizing the diversity and complexity of the tools at the disposal of public officials.

Reference: Salamon, L. M. (2002). The Tools of Government: A Guide to the New Governance

2. **Christopher Hood** introduced the concept of "tools of government" in his analytical framework. Hood classifies these tools into several categories: **nodality** (the use of information resources), **authority** (the use of legal or moral authority), **treasure** (the use of financial resources), and **organization** (the use of organizational resources) - **NATO**. This classification highlights the various ways in which public policy instruments can be conceptualized and utilized to implement policy.

Reference: Hood, C. (1983). The Tools of Government

3. **B. Guy Peters** defines policy instruments as "**the techniques or means for implementing public policy objectives**." Peters discusses the importance of choosing the appropriate instrument for a given policy goal and the implications of such choices for policy effectiveness and efficiency. He emphasizes the significance of understanding the characteristics of different instruments and their suitability for specific policy contexts.

Reference: Peters, B. G. (2018). Policy Instruments in Public Management

These definitions and their associated frameworks provide a foundational understanding of public policy instruments, highlighting the diversity of tools available for policy implementation and the critical considerations involved in selecting and deploying these instruments effectively.

4. Types of policy instruments

In theory, policy instruments are designed in response to one or more types of failure and can be categorized as being designed to address these failures.

1. **Market failure**. First recognized by Bator (1958), a market failure is a situation where, on their own, competitive markets fail at generating sufficient investment in science and technology. There are three sources of market failures:

   1.1 **Externalities**: the difficulty to exclusively own the outcome of one's own investment in R&D,
   1.2 **Uncertainty**: the difficulty in developing a common view, primarily between entrepreneurs and financiers, about the commercial result of an innovative business opportunity, and
   1.3 **Indivisibility**: doubts that sales volumes will be sufficient to justify the upfront R&D expenses for developing a new product.

2. **Systems failures**. Systems failures describes an underperformance of STI impacting growth and development due to insufficient interactions among key stakeholders (government, academia, firms and industries, civil society, etc.)

3. Transformative failure. The terms usually refers to two proximate but specific failures:

3.1 Directionality failure happens when an economy fails to develop a direction for transformative change, in terms of addressing imperative societal needs and goals. It is often a result of an inability to develop a shared local or national – or even global – vision and coordinating mechanisms aimed at the main socio-economic challenges at hand.

3.2 Reflexivity failure refers to a lack of continuous monitoring on the progress of transformative change which fails to provide inputs for adjusting policy and energizing policy learning.

In practice, policy instruments can vary widely and can be categorized by their form and function, including but not limited to the following.

1. Regulatory Instruments (Command and Control): These involve setting rules or standards that must be followed, often enforced through penalties for non-compliance. Examples include environmental regulations that limit pollution emissions or speed limits in traffic laws.

2. Economic Instruments (Market-Based Instruments): These use market mechanisms to encourage desired behaviours, such as taxes, subsidies, tradable permits, or fees, as well as fiscal, monetary, trade, and other policies. For example, a carbon tax is imposed to reduce greenhouse gas emissions by making it more costly to emit carbon dioxide.

3. Informational Instruments: These aim to change behaviour through the dissemination of information and persuasion, without the use of force or financial incentives. This would include education, training and capacity-building, as well as cultural instruments Examples include public health campaigns, energy efficiency labels on appliances, vocational training for technology, and training for STI policy experts.

4. Voluntary or Agreement-Based Instruments, PPP: These involve agreements between the government and private parties to achieve certain goals without the need for formal regulation. An example could be voluntary industry standards for reducing waste.

5. Direct Government Provision or Investment: This involves the direct provision of goods or services by the government or significant investment in infrastructure, research, or technology development. Examples include the construction of public hospitals, schools, or the funding of scientific research.

6. National Policies and Strategies: While these may be broad statements of development aspirations, they are – in themselves – critical instruments that link specific policy instruments to overall National Development Policy, ensuring coherence and improving chances for successful implementation.

7. International and Regional Strategies and Networks: Given the size and available resources in many developing countries, the necessary scale for policy intervention using specific policy instruments may only be reached through collaboration and cooperation on targeted issues of common concern.

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The United Nations and other international organizations and agencies will have their own, often similar, taxonomies of public policy and policy instruments.

5. Policy instruments for STI

Focusing on the STI policy domain, governments and other entities use a variety of policy instruments to promote science, research and development (R&D), innovation, enhance technology diffusion and transfer, and build a skilled workforce to enable technology and knowledge-led development. These instruments are crucial for addressing societal challenges, driving economic growth, and enhancing competitiveness and achieving sustainability (SDGs). Some of the key policy instruments in this domain may include:

1. Funding and Grants: Direct financial support to research institutions, universities, and companies for R&D activities. This can include grants for basic research, applied research, and development projects.

2. Tax Incentives: Offering tax credits or deductions to businesses that invest in R&D or adopt innovative technologies. This reduces the cost of investment in innovation and encourages companies to engage in research activities.

3. Public-Private Partnerships (PPPs): Collaborations between government entities and private sector partners to co-fund and co-develop new technologies or infrastructure. These partnerships can leverage the strengths of both sectors to achieve goals that might be out of reach for each acting alone.

4. Regulation and Standards: Developing and implementing regulations and standards that encourage innovation or ensure the safe and effective use of new technologies. For example, regulations can set performance targets that drive the development of more efficient or cleaner technologies.

5. Innovation Clusters and Hubs: Supporting the development of geographic concentrations of interconnected companies, specialized suppliers, service providers, and associated institutions in a particular field. These clusters can enhance knowledge sharing, drive regional innovation, and attract investment.

6. Intellectual Property Rights: Establishing and enforcing laws that protect intellectual property, such as patents, copyrights, and trademarks. This encourages innovation by giving inventors and creators exclusive rights to their discoveries and works for a certain period.

7. Education and Skills Development: Investing in STEM education and vocational training to build a skilled workforce capable of supporting innovation and technological advancement.

8. Research Infrastructure: Funding the development and maintenance of research infrastructure, such as laboratories, research centres, and digital infrastructure, to provide the necessary facilities for cutting-edge research.

9. Technology Transfer and Commercialization Support: Facilitating the transfer of technology from research institutions to the market and supporting the commercialization of research outcomes. This can include support for spin-offs, licensing agreements, and entrepreneurship training.

10. International Cooperation: Engaging in international collaborations and agreements to share knowledge, participate in joint research projects, and access global markets. This can also include participation in international standards-setting bodies.

11. Public procurement: Public procurement policy refers to the rules, regulations, and procedures that govern the acquisition of goods, services, and works by government entities or publicly funded organizations. Its purpose is to ensure that public funds are spent efficiently, transparently, and in a way that promotes economic and social goals. Public procurement for innovation may include pre-commercial procurement, challenge-based Procurement, innovation and technology partnerships, supporting SMEs and startups. It may also include sustainability criteria or social goals in its procurement policies.

12. National STI Policies and Strategies: These will link specific STI policy instruments to National Development Policy, establishing the case for funding and resources for development and implementation of STI policy instruments and thus ensuring coherence and improving chances for successful implementation.

13. International and Regional Strategies and Networks: Examples may include the establishment of formal Regional STI Policies (e.g. STISA 2024) as well as collaboration on marine and blue economy research, sharing technological infrastructure for prototype development and product testing, programmes on entrepreneurship development, or cooperation in IP development and support.

6. STI policy instruments in support of the SDGs

Addressing complex societal challenges requires the capacity to design and deploy many parallel interventions to address various aspects of the problem. STI policy for sustainable development can draw from a wide range of policy instruments providing direct support to innovators and improving the enabling environment for innovation activities that contribute to sustainable development. The table that follows presents selected STI policy instruments and their potential role in fostering innovation for sustainable development. (UNCTAD. 2019)

Policy Instrument	How It Supports Innovation for Sustainable Development
Regulatory Framework	
Environmental and health protection regulations	Provides incentives to innovate to comply with regulatory framework (e.g., substitution of harmful chemicals). Provides disincentives by introducing penalties.
Product and industrial process standardization	Provides incentives to innovate to comply with environmental and social performance standards for products and processes.
Consumer protection, labels, and certification	Promotes innovative products and processes by providing information on environmental and social performance of products and services to customers.
Intellectual property rights	Encourages firms to engage in innovation by protecting their knowledge and opens access to knowledge contributing to sustainable development.
Competition Law	Prevents monopolies or cartels that stifle innovation and hold back its benefits for consumers or the environment.
Bankruptcy Law	Encourages a risk-taking, entrepreneurial culture by protecting investors, firms, and consumers against negative effects of failure.
Economic Instruments	
R&D funding	Provides direct support for R&D underpinning sustainable innovation.
Innovation funding for companies	Supports innovation activities in areas relevant to sustainable development.
Equity support to venture & seed capital	Provides equity dedicated to innovation and de-risks innovation investments.
Feed-in-tariffs and similar subsidy schemes	Offers financial incentives to adopt and diffuse innovative technologies in areas like renewable energy.
Tradable permit systems (e.g., emissions trading)	Allocates or sells emission rights to polluters, encouraging innovation through the price and reduction of emission rights.
Removal of subsidies for unsustainable activities	Removes market distortions (e.g., subsidies for fossil fuels) that inhibit sustainable innovation.
Fiscal Instruments	
Tax incentives for R&D for companies	Provides tax reductions for companies undertaking R&D that supports innovation.
Tax incentives for technology adopters	Offers tax reductions for companies adopting innovations with environmental and social benefits.
Environmental taxation	Provides tax reductions for companies undertaking R&D that supports innovation.
Removal of tax reliefs for unsustainable activities	Removes market distortions (e.g., subsidies for fossil fuels) that inhibit sustainable innovation.
Demand Support	
Sustainable public procurement	Creates markets for goods and services with positive local impacts related to sustainable development, such as Green Public Procurement.
Pre-commercial procurement (R&D and innovation procurement)	Stimulates markets for innovative goods and services, promoting experimentation with new technologies.
Support to private demand	Provides incentives (e.g., vouchers) for consumers to purchase innovative goods and services with positive social and environmental impacts.

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Education & Training	
Adaptation of formal education curricula to address the SDGs	Adapts higher education and vocational training curricula to address sustainable development challenges. Develops skilled workforce with industry collaboration.
Placement schemes and staff mobility	Encourages learning, knowledge exchange, and connections between actors promoting sustainable innovation.
Regional Innovation Strategy & Networks	
Clusters, industrial zones, and science and technology parks	Encourages specialization in innovation areas relevant to societal challenges in regions needing goods and services with environmental and social benefits.
Technology platforms and networks	Promotes information and knowledge sharing on innovation.
Roadmaps and technology foresight	Creates shared vision, roadmaps, and commitments for eco-innovation development, connecting the innovation system.
Trade Policy	
Trade tariffs	Removes barriers to trade in innovative goods and services that contribute to the SDGs and opens access to knowledge important for the adoption and diffusion of technology. Imposes barriers on environmentally and socially harmful goods and services.
Capacity Building and Information Provision	
Business advisory services	Promotes skills and knowledge relevant for innovation.
Local entrepreneurship and business incubation	Promotes local entrepreneurship and local innovation.
Technology transfer and matching	Promotes identification and acquisition of innovative technologies relevant for tackling specific challenges.
Capacity building for governments	Enhances government capacity to design, implement, coordinate, and evaluate STI policy supporting sustainable development.
Market intelligence services	Promotes information, data, and knowledge sharing on innovation trends related to sustainable development, reducing information asymmetry.
Information and Cultural Instruments	
Education and awareness raising	Campaigns or programs that can popularize science, technology, and innovation, while enhancing democratic input into innovation policy.
Network facilitation and enhancement	Facilitates learning and sharing through events like Failure Nights, Start-up Weekends, etc.
Virtual and material infrastructure/events for innovation network-building	Organizes events like hackathons, maker spaces, and transformation labs to encourage innovation network-building.

Source: https://unctad.org/system/files/official-document/dtlstict2019d4_en.pdf

7. Policy instrument design process

Designing a policy instrument involves a systematic process that aims to ensure the selected tool effectively:

- addresses the policy problem, and
- achieves the desired outcomes.

Specific steps can vary depending on the policy area, the scale of intervention, and the stakeholders involved. An ideal process would include several of the key steps described below.

The process is iterative to ensure policy learning. The design of a policy instruments should be evidence-based, inclusive and sustainable, and open to adaptation reflecting changing circumstances.

1. Define the Policy Problem: Clearly identify and understand the problem that needs to be addressed. This involves gathering data, consulting stakeholders, and analysing the root causes and effects of the issue. A well-defined *problem statement* is crucial for the subsequent steps.

2. Set Clear Objectives: Establish specific, measurable, achievable, relevant, and time-bound (SMART) objectives for what the policy instrument is supposed to achieve. These objectives should address the root causes of the policy problem identified in the first step.

3. Analise context: Develop a clear picture of the national system of innovation including what are the capacities of involved stakeholders and how developed their linkages are among themselves. Consider cultural, social and political factors.

4. Identify Options: Generate a list of potential policy instruments that could be used to achieve the policy objectives. This could include regulatory measures, economic incentives, informational campaigns, or direct government intervention, among others (see above 2. and 3.).

5. Assess Feasibility and Impact: Evaluate the potential effectiveness, efficiency, and feasibility of each option. This involves considering the economic, environmental, social, and political implications of each instrument. Cost-benefit analysis, risk assessment, and stakeholder analysis are useful tools at this stage.

6. Select the Instrument: Based on the assessment and consultations, choose the most appropriate policy instrument or combination of instruments. The selection should be justified by its ability to effectively achieve the policy objectives, its cost-effectiveness, and its feasibility within the current context.

7. Design the Implementation Plan: Develop a detailed plan for implementing the chosen policy instrument, including timelines, responsible parties, resources required, and mechanisms for monitoring and evaluation. This plan should also consider the need for capacity building and any legal or regulatory changes required.

8. Pitfalls and risks in policy instrument design

Designing a policy instrument involves a complex process that requires careful consideration of various factors to ensure the effectiveness and efficiency of policy implementation.

However, despite careful planning, several pitfalls and risks can arise during the policy instrument design process. Understanding these challenges is crucial for policymakers to mitigate potential problems and enhance the success of policy interventions. To navigate these pitfalls and risks, policymakers should engage in thorough problem analysis, stakeholder consultation, and pilot testing of policy instruments. Additionally, building adaptability into policy designs and establishing robust evaluation frameworks can help in adjusting policies as needed and improving outcomes over time.

Here are some main pitfalls and risks in the policy instrument design process:

1. Mismatch Between Instruments and Objectives: One of the primary pitfalls is the selection of policy instruments that do not align well with the policy objectives. This mismatch can occur due to inadequate understanding of the problem, overly optimistic assumptions about the behaviour of target groups, or a lack of clarity about the policy goals themselves.

2. Underestimating Implementation Complexity: Designing a policy instrument without fully considering the complexity of its implementation can lead to significant challenges. This includes underestimating the resources required, the time frame for seeing results, or the complexity of coordinating actions among various stakeholders.

3. Neglecting Stakeholder Interests and Responses: Failing to account for the interests, incentives, and potential responses of various stakeholders can lead to resistance, non-compliance, or unintended consequences. Stakeholders might have the power to obstruct or undermine the policy, especially if they perceive it as harmful to their interests.

4. Overlooking Contextual Factors: Policies designed without an understanding of the socio-economic, cultural, and political context can fail to achieve their objectives.

5. Insufficient Flexibility: Designing policy instruments that are too rigid can make it difficult to adapt to changing circumstances or new information. Policies need some level of flexibility to adjust to unforeseen challenges or shifts in the policy environment.

6. Inadequate Evaluation and Feedback and Learning Mechanisms: Without built-in mechanisms for monitoring, evaluation, feedback, and policy learning, it is difficult to assess the effectiveness of policy instruments or make necessary adjustments. This can lead to the continued implementation of ineffective or inefficient policies.

7. Political and Economic Constraints: Political realities, such as changes in government, policy priorities, or budgetary constraints, can impact the design and implementation of policy instruments. Economic conditions can also affect the feasibility and sustainability of policy measures.

8. Risk of Unintended Consequences: Even well-designed policy instruments can have unintended consequences, including negative impacts on certain groups, distortions in markets, or environmental side effects. Failing to anticipate and mitigate these risks can undermine the policy's overall effectiveness.

9. Examples of successful policy instruments for STI

Designing and implementing successful policy instruments in the science, technology, and innovation (STI) domain can significantly contribute to a country's economic development and competitiveness. The examples below illustrate how targeted interventions can foster innovation, support research and development, and encourage the adoption of new technologies. The success of these policies underscores the importance of strategic planning, targeted investment, and collaborative efforts between the government, academia, and industry.

1. South Korea's Innovation Policy - Technology Development Program

South Korea's focused approach to STI policy, particularly through its Technology Development Program, has been pivotal in transforming its economy into one of the world's leading innovation hubs. This program, initiated by the government, provides targeted funding for R&D in key technology sectors, fostering public-private partnerships and supporting the commercialization of research findings. South Korea's strategic investment in education and infrastructure, alongside these direct support measures, has contributed to significant advancements in sectors like electronics, automotive, and information technology.

Reference: Lee, K., & Lim, C. (2001). Technological regimes, catching-up and leapfrogging: findings from the Korean industries

2. Brazil's Sector Funds for Science and Technology - Investments in science and technology

Brazil implemented the Sector Funds in the late 1990s as a policy instrument to increase investments in science and technology across various sectors of the economy, including agriculture, health, energy, and information technology. These funds are sourced from specific industries and are dedicated to supporting R&D activities within those sectors. This approach has enabled targeted support for innovation, fostering collaboration between universities, research institutions, and industry. The Sector Funds have contributed to enhancing Brazil's research capabilities and innovation output in strategic areas.

Reference: Albuquerque, E. M. (2007). Innovation and technological capability in developing countries: A study of the Brazilian experience.

3. Singapore's Research, Innovation, and Enterprise (RIE) Plan - Development of technological capabilities

Singapore's RIE Plan is a comprehensive policy framework aimed at driving the country's development through science, technology, and innovation. The plan involves significant investment in R&D, the development of technological capabilities, and the enhancement of the entrepreneurial ecosystem. Through the RIE Plan, Singapore has successfully attracted global talent, increased public and private R&D expenditure, and established itself as a leading innovation hub in Asia and globally.

Reference: Wong, P. K., Ho, Y. P., & Singh, A. (2007). Towards an 'Entrepreneurial University' model to support knowledge-based economic development: The case of the National University of Singapore

4. Finland's Tekes (now Business Finland) - Funding and Support for R&D and Innovation

Finland's national funding agency for research and innovation, originally known as Tekes and now part of Business Finland, has played a pivotal role in driving the country's innovation ecosystem. Tekes provided funding, advice, and networking opportunities for research organizations and companies to undertake innovative projects. Its focus on high-risk projects and the ability to foster public-private partnerships significantly contributed to Finland's reputation as an innovation leader, particularly in ICT and clean technology. Tekes' success can be attributed to its flexible funding schemes, which cater to both SMEs and large companies, and its role in facilitating international collaboration. Its approach to funding projects that are considered too risky for private investors has helped fill a critical gap in the innovation ecosystem.

Reference: Lemola, T. (2002). Convergence of national science and technology policies: The case of Finland

5. India's National Innovation Foundation (NIF) - Grassroots Innovation and Traditional Knowledge

The National Innovation Foundation (NIF), established in 2000, aims to support grassroots innovators and traditional knowledge systems in India, particularly those from economically disadvantaged backgrounds. NIF helps in scouting, documenting, and scaling up grassroots innovations, providing both financial support and intellectual property rights protection to the innovators. NIF's success is rooted in its inclusive approach to innovation, recognizing and nurturing ideas from the grassroots level. By providing a platform for these innovations to be recognized, patented, and commercialized, NIF has facilitated the integration of traditional knowledge and local innovations into the broader economy.

Reference: Gupta, A. K. (2006). From sink to source: The Honey Bee Network documents indigenous knowledge and innovations in India.