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Steps to analyse NSI and establishing NSI

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Report: Good practices and lessons learned on setup and implementation of National Systems of Innovation (NSI)

- Identified lessons for preparation, design and implementation, as well as evaluation, monitoring and review phases
- Based on 6 case studies:
 - The Indian Bureau of Energy Efficiency (BEE);
 - The Kenya Climate Innovation Center (KCIC);
 - Haiti’s Disaster Risk Reduction Strategy (DRR);
 - Brazil’s bioethanol transport fuel activities;
 - Jakarta, Indonesia’s urban flood management activities;
 - Denmark’s wind energy sector
- Both mitigation and adaptation



Overall recommendation on how to analyse and establish National Systems of Innovation (NSIs)

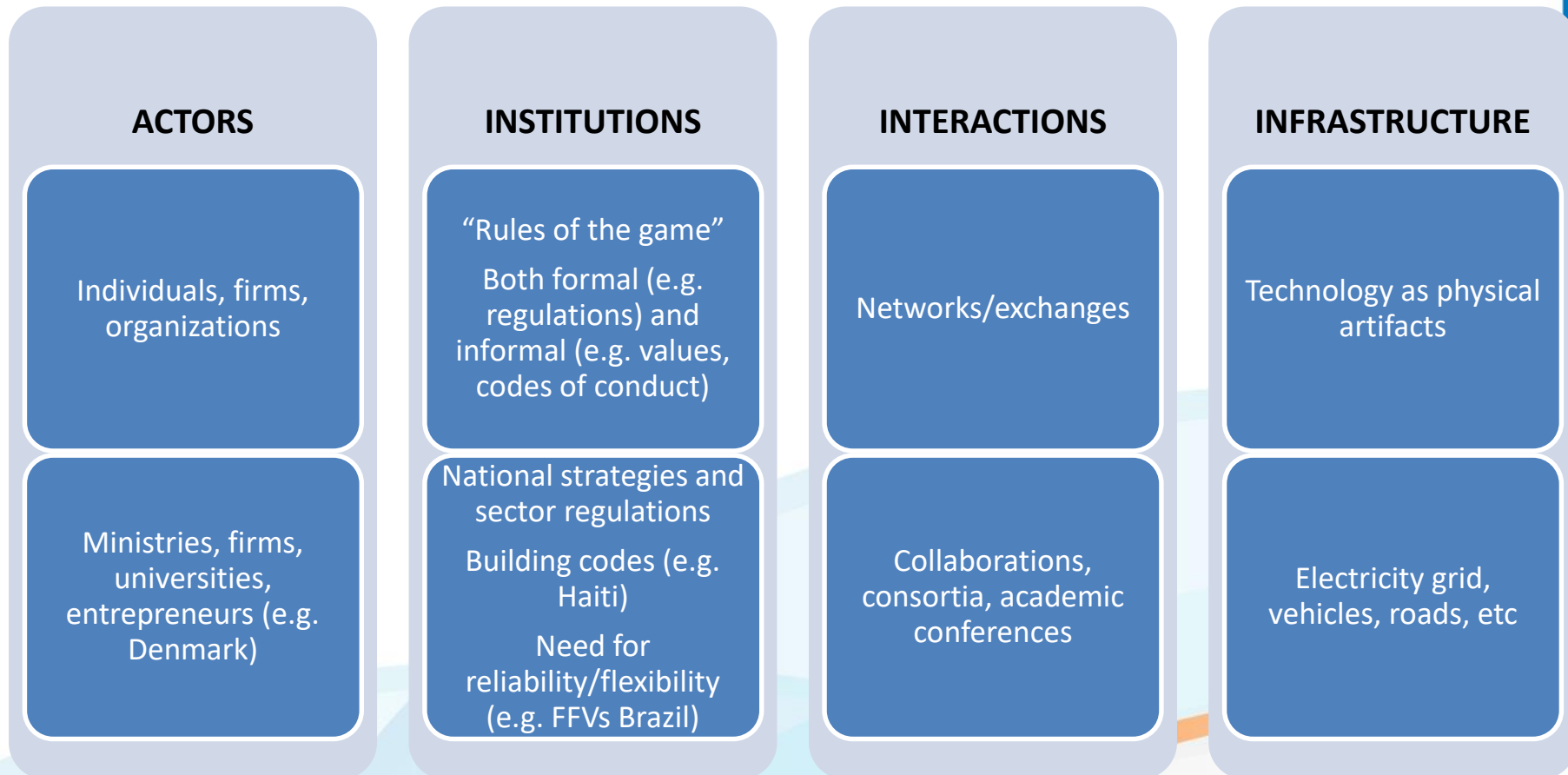
“The overall recommendation is that implementation of the NSI is best guided through a **systemic approach** that draws upon **NSI functions** and **structure-function frameworks**”

What do we mean by that?

A SYSTEMIC APPROACH TO INNOVATION

What is a system of innovation?

"The **elements** and **relationships** which interact in the production, diffusion, and use of new, and economically useful, knowledge"



A SYSTEMIC APPROACH TO INNOVATION

How does the system contribute to innovation?

#	Function	What	Case study examples
F1	Knowledge development & diffusion	R&D activities, conferences, joint research	KCIC: capacity building of local firms; local/national and international R&D collaborations, pilots and demonstrations of new technologies (e.g., new rice varieties, etc.); networking events
F2	Entrepreneurial experimentation	New business models, experimentation with new technologies and applications	Collaboration between sugarcane producers, universities and technology providers (Brazil) Experiments with wind energy in rural areas (Denmark)
F3	Market formation	Creation of a market through definition of demand and choices, prices, standards, etc	KCIC: supports fund generation and capacity building at supply side of the market Brazil: Flex-fuel vehicles + quotas of ethanol in gasoline Denmark: Regulations for grid integration/prices of wind energy
F4	Influence on the direction of search	Influences decisions of research and investment on e.g., which technologies to explore, which to ignore, how to channel resources, etc	Identification of priority sectors for research and innovation Setting targets (e.g. emission reduction, share of RE, etc)
F5	Resource mobilization	Financial and human resources (workforce and capabilities)	Actual mobilization of funding and training Connecting funding sources to project developers
F6	Legitimation	Innovations become seen as “legitimate” by stakeholders. This can be in regulative, normative, or cognitive terms.	KCIC recognized as the official implementing agency under the Kenya Vision 2030 (regulative) Environmental concerns, energy security and socio-economic benefits increase legitimacy of wind energy and ethanol
F7	Development of positive externalities	Positive effects/resources that become available to actors that did not contribute to building them up	KCIC: A pool of skilled technicians to operate and maintain green projects Emission reductions

A SYSTEMIC APPROACH TO INNOVATION

How to assess the performance of the system?

A structure-function coupled analysis

Structural component	Systemic problem (Weakness)	Type of problem
Actor (for F1 to F7)	Absence of relevant actor/s	Presence/absence
	Absence or inadequate capabilities in the actor/s	Capability
Institutions (for F1 to F7)	Absence of required/relevant institutions	Presence/absence
	Absence or inadequate institutions	Capability
Interactions (for F1 to F7)	Absence of interactions between relevant actors and organizations (due to distance, lack of trust, lack of capabilities, divergent goals, etc.)	Presence/absence
	Inadequate quality or intensity of interactions (too strong, too weak)	Quality or intensity
Technology (incl. physical artefacts, knowledge setups, financial infrastructure, etc.) (for F1 to F7)	Absence of technology, infrastructure	Presence/absence
	Inadequate quality of the infrastructure	Quality

- The scope of analysis can vary from the national level to sectors, to single technologies
- To assess the contribution of an intervention, look at how it helps to overcome systemic problems

In summary...

How to analyse and establish NSIs?

“Drawing from the analysis of the case studies, the overall recommendation is that implementation of the NSI is best guided through a **systemic approach** that draws upon **NSI functions** and **structure-function** frameworks as a way to suitably organize efforts”.

- Define the scope of the analysis
- Identify system structural components
- Assess their strengths and weaknesses throughout the seven functions
- Design interventions to address systemic problems
- Ensure monitoring, evaluation, and review

In addition....

Lessons learned: success factors

1. Take a systemic perspective towards the establishment/strengthening of the NSI, integrated with host country development objectives (all cases)...
2. ... yet a tailored approach to bridging sector- and innovation phase-specific gaps (all cases)
3. Leadership with a collaborative attitude and an understanding of local context (all cases)
4. Participation of/interactions among local actors facilitates innovation and alignment (all cases)
5. Engage with international institutions and collaborations to help build local institutions and networks (BEE, KCIC, Haiti DRR, Jakarta)
6. Ensure that innovation/organizations are evolutionary and able to adapt to new circumstances, through continuous monitoring and review (all cases)
7. Use a portfolio of solutions (all cases)
8. Deal with structural underlying problems (Jakarta, Haïti DRR, Brazil)

For further information:



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