Effective Governance of Climate Change Adaptation

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Abstract

Climate change adaptation (CCA) requires the design of institutions and policies that integrate efficiency, equity, and effectiveness (EEE) objectives of systems at national and sub-national levels. Multi-level and multi-sectoral perspectives are offered in this paper incorporating the following dimensions: normative aspects of institutions, mechanisms for resource allocation, role of transaction costs (TC), adaptive efficiency (AE) and dynamic flexibility to respond to uncertainties as well as new information. An approach involving stakeholders in their capacity-based roles, contributing toward the reduction of TC and enhancing dynamic AE, is formalized in a multi-level and multi-sectoral framework. Infrastructural pre-requisites for adopting this approach are identified. Among these are organizational mechanisms and technologies for information sharing, active learning via monitoring and evaluation, contingency planning at appropriate levels, and provision of incentives for efficient performance of stakeholders. A matrix offers plausible scenarios of institutional and resource allocation mechanisms that are geared toward CCA incorporating EEE aspects.

The above approaches are largely normative. In the second part of the paper, select case studies of the evolving frameworks from the UK and the USA are examined to highlight the scope for pragmatic institutional reforms to enable improved governance of CCA in each of these systems at national and sub-national levels. The latest Intergovernmental Agency Task Force Reports of the US Federal Government are also reviewed and potential for improvements suggested.

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1. Introduction

Climate Change Adaptation (CCA) has come to the forefronts as one of the main aspects of climate change governance (CCG) relatively recently with increasing realization that: a) we are falling behind on drastic reduction of greenhouse gas emissions; and, b) the existing concentration of these causes seems to accelerate the pace of climate change and its adverse impacts. Accordingly, significant additional resources need to be made available in order to address the CCA aspects, both in developing as well as developed countries. This makes it imperative that governance issues must be addressed soon in order that the contemplated policies and their governing institutions are up to the task. There is an urgent need for adaptive capacity building at all levels and sectors in most systems. Similarly, the role of multiple approaches needs to be fully examined in order to take advantage of benefits of adoption of such mechanisms and norms of governance. Also, the governance issue becomes a high priority in light of large-scale linkages and integration requirements of adaptation with the rest of the economic systems. This paper brings to focus a few normative yet pragmatic approaches for this purpose.

After a brief comparison with the role of adaptation in general economic systems, this paper highlights some of the key elements of governance and their role in climate change adaptation (CCA). The relevant, though not universally accepted, criteria for the governance of CCA are enunciated here. Finally, the ‘guiding principles’ of CCA in the UK and the US are summarized for review and suggestions offered for revisions. Conclusions and recommendations are offered in the final section.
2. Institutional Economics and Transaction Costs in Governance

The theme of modes of governance, design and choice of policy instruments is better addressed using some of the important approaches offered by the foundations of new institutional economics and transaction cost economics (TCE). It is useful to recall that adaptation featured as a central theme of these foundations in economic systems (during the 1930s and 1940s, thanks to seminal contributions of Chester Bernard and Friedrich Hayek) - much before the world thought of paying attention to CCA. Adaptation is one of the central concepts of TCE. Both the mechanisms of autonomous / spontaneous and planned adaptation are relevant, simultaneously, in order that the interventions are effective.

Some of the issues of adaptive efficiency (AE), and effective governance, have been examined in the sub-disciplines of TCE as well as in the mainstream neo-classical economic approaches. Both streams are available for use, if the policy problems are posited and examined in the right manner: use the former to assess alternative mechanisms of governance, and the latter for allocative efficiency of resource deployment.

AE is defined as the ability of institutions and economic systems to undergo change in response to new situations. The role of AE is critical to sustain and accelerate economic progress, as the lessons of experiences across countries and over time have demonstrated (Rao, 2003; North, 1990).

Creation of knowledge and its productive contribution to the economy is better facilitated when the complementary or catalytic role of public policy is at work. This is because market signals are not sufficient to enable efficient allocation of resources, nor in ensuring sufficient degree of AE that is essential for sustained economic performance.

Among several of the alternative and overlapping categories of adaptation activities, we may need the main focus on autonomous adaptation (the processes that occur in private sector and individual levels, irrespective of other public intervention strategies), and, planned adaptation (a series of measures aimed at adaptation based on current and anticipated changes in the relevant systems).
Besides, what is called *maladaptation* needs careful examination. Maladaptation is the result of inefficient choices of strategies and policies in any category of adaptation measures that eventually contribute to worsening of the adaptation potential over time and / or scale or in combination with other interventions. It is also sometimes viewed as the result of the adaptive responses made for various interdependent systems without due consideration of adverse impacts on other components (that may or may not be sufficiently influenced by climate change). Externalities of adaptation measures can lead to maladaptation, and it may be more meaningful to restate as follows:

*maladaptation is a phenomenon in the category of externalities that needs to be constantly and fully taken into account in various aspects of the governance of CCA.*

In this sense, the IPCC definition (given below, source [www.ipcc.ch/pdf/glossary/tar-ipcc-terms-en.pdf](http://www.ipcc.ch/pdf/glossary/tar-ipcc-terms-en.pdf)) requires modification to incorporate the role of externalities as the driving principle in maladaptation:

“any changes in natural or human systems that inadvertently increase vulnerability to climatic stimuli; an adaptation that does not succeed in reducing vulnerability but increases it instead”.

Let us note that maladaptation phenomenon prevails as a rule, rather than as an exception, if adaptation policies are designed for a sector without due consideration of its linkages (forward and backward) with other related sectors of the system under consideration; similar feature holds in a multi-level framework if the iterative processes of information feedbacks are not duly factored in a *tatonnement* process between different levels iteratively. This methodology is rather well established in economic planning and may need to be invoked here (even in a two-level planning exercise), with the objective of ensuring maximum potential adaptation for a given set of resources with little scope for maladaptation. This approach requires considerable further attention, and is founded on the availability of metrics and information of the effects of intervention on performance with respect to adaptation.

The Design of Institutions for Governance

Let us turn to the definition of *institutions* (adapted from Rao, 2003):
A set of formal or informal rules of interaction and governance of resources of all types; these are stipulations that structure political, social and economic interactions, and consist of both formal rules (as in the laws and regulations) and informal constraints (such as traditions).

An organization (defined as an arrangement involving staff and functionaries within an institutional setting) is part of an institution but not vice versa.

Endogenous Institutional Response (EIR) is the phenomenon of institutional responsiveness to changing information and circumstances in sustained pursuit of the stated or normal mission of the institution. It may be considered the equivalent of resilience of systems and applied to organizations.

Proposition 1

A necessary ingredient of responsive governance is the EIR; this reduces the costs of supervision and its failures, and can be incentive-compatible.

Proposition 2

The existence of positive EIR is a necessary but not sufficient condition for enhancing AE.

Dynamic AE is the phenomenon of prevalence of AE over successive time intervals. Dynamic flexibility is a process of retaining flexibility of decisions over time in such a manner that the earlier set of activities stay in congruence with the objectives of the successive sets of decisions and actions. This process can be exogenous, or endogenous, or both.

The central problem of economic organization is that of adaptation, and the object of economic organization may be stated (Williamson, 1996) as one of adapting to disturbances (of both autonomous and other kinds).

The issue of spontaneous and sequential adaptation is matter of pragmatic planned arrangement, since the imperatives of change do not wait for an entity’s convenience.

Transaction Costs (TCs) (adapted from Rao, 2003) include: a) costs of undertaking a transaction, including search and information costs, bargaining (negotiation) costs, and monitoring – enforcement costs of implementing transactions, including evaluation and feedback costs; and b) the opportunity costs of non-fulfillment of an efficient transaction.
TCs include the *ex ante* costs of planning and the *ex post* costs of maladaptation and adjustment as a result of unanticipated disturbances (Williamson, 1996, p. 379). Although this concept has been advanced in the context of economic systems generally, the key elements require further attention in the context of governance of CCA.

The main approach of TCE has been suggested by Nobel Laureate Oliver Williamson (1989): assign attribute-differentiated transactions to governance structures (which depict differing competencies and other potentials) in a transaction-cost-minimizing manner, where TC are interpreted broadly as the ‘*comparative costs of planning, adapting, and monitoring task completion under alternative governance structures*’ (p.142). Comparative efficacy is the main guiding norm here. It has also been observed that the efficacy of hierarchy is lowest when disturbances in the system require primarily autonomous adaptation.

3. **Policy, Institutions, and Governance**

*Effective governance of climate change adaptation (EGCCA)*

*EGCCA may be defined as the design and implementation of CCA policies, monitoring and evaluation of the same in an effective, equitable and efficient manner (EEE) on a sustainable basis.*

Here the reference to effectiveness is to be seen in terms of the adaptation-enhancing results; equitable approach involves multi-stakeholder consultation, involvement and accrual of benefits in a fair and equitable manner; and, efficiency is assessed in terms of cost-effectiveness where the cost elements include direct and indirect costs as well as all relevant TCs. Comparative economics of organizational arrangements and their economic efficacy matter here. Another direction of enquiry dealing with ‘good governance’, stated below, is noteworthy; this constitutes a set of complementary requirements in an overarching sense of EGCCA, since the issues of legitimacy are not explicitly incorporated in the definition of EGCCA.

‘*Good Governance*’ of adaptation should be (Termeer et al, 2011):

a) legitimate, i.e. ensure transparency, accountability, fairness, and equity;

b) effective, i.e. address adaptation task decisively and efficiently through the right mix of strategies and tools; and,
c) resilient, i. e. enabling autonomous adaptation as well as constructive and long-term adaptive capacity.

*Proposition 3 (adapted from Rao, 2010)*

There exists a sequence of the design of adaptation measures; a hierarchy has been suggested in the sequence of analyses:

- Assess and define governance mechanisms
- Get the institutions right
- Get the property rights and prices right
- Get the feedback systems right
- Get the adaptation and adaptive systems right

This approach and corresponding methodologies (including those of neo-classical economics) are viewed as an integral package that addresses both the foundations and operations of governance.

We start with a set of issues for EGCCA. Are CCA and its governance to be seen as a stand-alone system or in relation to other complementary (sometimes conflicting) systems in the climate, socio-economic and institutional? Is the final objective simply adaptation to somewhat foreseeable situations and events or is it also relevant to consider extreme events? To what extent an overlap of CCA and disaster risk reduction (DRR) important in the design of CCA policies and assessing their effectiveness?

These issues also need to be reflected in EGCCA, but are not considered in this paper. These are some of the directions for future investigations. The special report on extreme events (SREX) of the IPCC (2011) indicates the need for greater integration of CCA and DRR plans of action and their effectiveness, but considerable further work is needed to devise and operationalize relevant strategies.

Among the main elements of operational strategies for regional governance of CCA, as identified by Termeer et al (2011) are:

- Connecting Policy Domains,
- Connecting Scale Levels, and
- Connecting Leadership.
Clearly these need to be related to the contexts and specific features of an area and sector. In general, the coordination problem is the trickiest one: analytically it is easier to state the required steps for an effective coordination but adoption of such a strategy often remains elusive in most systems. This is because of ‘agency maximands’ (entities seek to engage in activities that enhance their own objectives such as profits in private enterprises and budgetary allocation in public enterprises), and strategic choices (often influenced by the presence of incentives such as subsidies and/or lack of disincentives for non-compliances with stated guidelines for policy and implementation) of entities that may not easily align with the overall objectives and goals of adaptation.

**Adaptive Capacity (AC)**

AC is the ability of a system to adjust to climate change and its adverse impacts to cope with the consequences or take advantage of opportunities (IPCC, 2007).

Enhancement of AC and CCA: what relationships?

CCA includes AC as one of the measures. Whether or not AC is qualified by the EEE criteria depends on the specifics of the components of the AC system and its relationship with the rest of socio-economic, physical and other systems of an area or society. Integrating EEE into CCA activities requires considerable additional clarifications about the scale and temporal horizons of the CCA activities. It is neither feasible nor desirable to seek the each of the EEE criteria in every policy selection; the relevance and applicability is to be seen in the context of the potential for incorporating in appropriate stages, scales, and time horizons that make the overall attainment of objectives in an effective manner. In other words, the policy space may not permit full consideration of EEE criteria, but due consideration must be given to the extent of feasible. For example, in erecting sea wall in a coastal flood zone, it may not be possible to bring in the equity dimensions when the hydrogeological requirements suggest the need to locate the structure where the affected section of the population are not necessarily economically vulnerable. However, high priority is needed for the most vulnerable in various related measures of CCA.

4. **Multi-Sectoral and Multi-Level Approaches**

Very few studies report explicit integration of multi-sectoral integration of CCA, other than seeking to mainstream CCA into all development activities. Similarly,
methods and application of multi-level approaches are also rather limited. In the national
and sub-national systems, the UK policies attempt these processes, summarized in the
next section.

Decentralized approaches in a multi-level planning and implementation of CCA bring
to surface a known phenomenon in economic planning, stated below (adapted and revised
from Rao, 1977).

**Proposition 4**

*There exists an optimal degree of decentralization in relation to the processes of
information gathering, communication across levels, monitoring and evaluation,
incentive-compatibility of actions, and information base for decision-making.*

As an illustration of the above, it is useful to state from Biesbroek et al (2011):
“…actors from low levels of governance seem to consider the barriers as more severe
than actors from high levels of governance”. This is typically the case when the lower
levels have to answer for themselves (with little information basis) a number of
unknowns about resources and coordination of policies. Thus, there is need for greater
attention to the multi-level planning and coordination aspects in most systems.

Steurer et al (2011) reported a major study that examines on the governance of CCA
with special reference to 10 OECD countries; their methodological basis includes focus
on four governance dimensions:

a) integration of sectoral policies horizontally;
b) integration of policies across various levels of government;
c) improvement of the knowledge base of policies (including assessments of various
uncertainties and changes over time, effectiveness of CCA measures); and,
d) facilitate stakeholder participation.

Possible role of analysis using TCE can also be augmented in these dimensions.

The desirability of more effective integration of climate change mitigation activities
and CCA activities is a very high priority in the interests of economic efficiency and
effectiveness of CCG as a whole. The ‘no-regrets’ approach to the design and
implementation of CCG activities is of pragmatic relevance as it becomes a relevant
intervention even if there are no large scale changes in the climatic phenomenon.
Hallegatte (2009) identified major sectors, time-scales and applicability of no-regrets criteria:

Category A: High Exposure to climate risks
Water infrastructure (dams, reservoirs and such other hardware) (30 to 200 years)
Land use planning (especially coastal and flood prone) (about 100 years or more)
Coastal flood defenses (about 50 or more years)

Category B: Medium Exposure
Buildings and Housing (30 to 150 years)

Category C: Low Exposure
Transportation (30 to 200 years)
Urban structures (about 100 or more years)
Energy production (20 to 70 years)

The recommended priority sectors and sub-sectors for no-regret strategies include the following:

Development of climate resilient crops
Early warning and evacuation systems
Improvements in public health systems
Institutionalization of perspective planning
Enhancement of water use efficiency
Sustainable land-use planning

In each of these, the role of EEE criteria and of EGCCA can be assessed with reference to the specific elements of strategies, policies and their implementation. For example, enhancement of water use efficiency (in this case we consider farm irrigation) can be attained by a combination of the following interventions: recycling, water channel lining to reduce seepage losses, deployment of drip and sprinkler irrigation, water harvesting and storage, and a few other measures. Equity criterion relevant when schemes are designed and implemented that favor the most vulnerable segments of farmers; efficiency (economic) criterion requires evaluation of the roles of water user organizations in combination with alternate water supply and usage mechanisms (and in relation to various water use efficiency targets) and their cost-effectiveness; effectiveness
can be assessed in terms of the ability of the system (after some of these interventions) in reducing vulnerability to changes in hydrological factors (and climate change).

National Adaptation Plans in Least Developed Countries (LDCs)

What is happening in the least developed countries in their adaptation plans? The UN Framework Convention on Climate Change (UNFCCC) supports preparation of National Adaptation Plans of Action (NAPAs) in these countries and these plans enable them to obtain assistance from the UNFCCC, UNDP and the World Bank/GEF.

The relevant guidelines for the preparation of NAPAs were originally designed in 2001 by the UNFCCC (document FCCC/CP/2001/13/Add.4). These include, *inter alia*, participatory process, multidisciplinary approach, complementary to other relevant activities, country-driven approach, cost-effectiveness, sound environmental management, simplicity and procedural flexibility. In practice, some of the countries adopt a perfunctory approach to participation of stakeholders, and this aspect is one of the weakest elements of the current guidelines and implementation of NAPAs. Very few guidelines exist for the governance of the NAPAs, and the scale of operations remains too small relative to the realistic needs of CCA.

5. **Case Study: UK**

A good degree of decentralization may be noted when DEFRA stated (www.defra.gov.uk/environment/climate/sectors/local-authorities/):

Local authorities are free to decide how best to address the impacts of climate change and also to take advantage of any opportunities. DEFRA also hosts meetings of the Local Adaptation Advisory Panel (LAAP) in order to provide a regular communication and dialogue with various partners and also hierarchically with authorities at various levels. Besides, the NI188 framework of indicators enables a reasonable information reporting.

DEFRA identified the main barriers to CCA (www.defra.gov.uk/environment/climate/adaptation/government-role.htm, visited on October 1, 2010)

- Information failures and market failures;
- Behavioral aspects that procastinate relevant actions, or inertia;
- Adaptive capacity limitations;
Natural limits of various physical systems when they are under influence of several stress factors.

According to DEFRA, interventions to overcome barriers to adaptation can be assessed against three criteria: effectiveness, efficiency, and equity. Besides, there also limits to government’s role since corporate entities and individuals have to their own roles to play, although government can set up a framework to effect changes.

Guiding Principles of good adaptation include the following [www.defra.gov.uk/environment/climate/programme/principles.htm]:

Adoption of sustainable development approach so as to minimize the adverse impacts of climate change and capitalize on potential opportunities presented by it;
Proportionate and Integrated Actions-that relate to the level of risks, desired outcomes, and timescales;
Collaborative and open systems of intervention within and across sectors and organizations;
Effective and flexible to adjust to a range of climate change scenarios, as well as socio-economic, technical and other changes;
Efficient to reflect costs, benefits, timing and uncertainty;
Equitable to ensure that some sections of society do not bear a disproportionate share of adaptation costs or bear residual risks.

6. Case Study: USA

The US Federal Government has set up in 2009 the Interagency Task Force on Climate Change Adaptation (hereafter referred to as Task Force) with about 20 departments and agencies that directly participate in the formulation and dissemination of plans. Besides, select states and local authorities (including coastal regions) have come up with their own initiatives to devise and implement CCA plans.

The resource provision and governance of most of these require lot more attention than has been accorded thus far. Most plans are in their infancy.

Before the formation of the Task Force, the federal Government Accountability Office (GAO) prepared a report that indicated the prevailing lacunae in the CCA systems governance. Federal, State, and Local governments face several challenges in their CCA efforts, and adaptation efforts are “constrained by a lack of clear roles and
responsibilities” among these governments (GAO, 2009, p. 31). “Competing priorities make it difficult to use limited funds on adaptation efforts” (GAO, 2009, p. 32).

Later, a GAO Report of July 2011 (GAO, 2011) found that the respective national and sub-national governments are beginning to adapt to climate change. Lack of clear roles and responsibilities has been stated as a problem in the 2011 GAO Report as well. The Report also stated funding for adaptation and other federal climate activities needs to be better tracked, reported, and aligned with strategic priorities. The need for establishing formal coordination mechanisms is also stated.

Federal agencies are currently undertaking a series of activities in relation to the stipulations of the actions of the Interagency CCA Task Force reports and the Directives of the White House Council on Environmental Quality (CEQ). A survey conducted by the GAO among various federal agencies suggested that there is need for government-wide strategic planning process that promotes a shared understanding among various agencies of strategic priorities in the context of CCA.

A set of Guiding Principles of Adaptation have been stated (US Government, 2011; www.whitehouse.gov):

Adoption of Integrated Approaches
Prioritization of the most vulnerable
Use of Best Available Science
Build strong partnerships across sectors and scales
Adoption of risk management methods and tools
Adoption of ecosystem-based approaches
Continuous evaluation of adaptation actions
Maximize mutual benefits with complementary approaches to address disaster preparedness and development of cost-effective technologies.

The Task Force is expected to draw up plans and forge ahead on non-federal partnerships, regional coordination and implementation plans with an action plan by March 2014. Agencies across the federal government are working on a diversity of non-Federal partnerships for collaboration and coordination, exchange of information on lessons learned with cities, states, other nations and entities.
Regarding select other countries, based on four country case studies (for Finland, Italy, Sweden and the UK, see Westerhoff et al, 2011), it has been observed that Finland’s method of mainstreaming adaptation into existing national plans and policies ensures that all ministries and departments are responsible for the activities in their jurisdictions (rather than an environmental agency). In Sweden and the UK, strong horizontal coordination and stakeholder engagement have reduced potential conflicts and discrepancies in developing and implementing relevant policies.

7. Conclusions and Recommendations

In terms of the formal economic approaches to the governance of CCA, it is useful to draw upon the foundations and further developments from the economics of institutions and transaction cost economics. Analytical and qualitative approaches are useful from this recipe. We would rather be approximately right rather be precisely wrong!

Optimal adaptation involves synergistic mix of soft and hard adaptation measures (see also Sovacool, 2011). Governance issues apply in either category, and especially in the joint category that offers synergistic effectiveness of CCA measures. EGCCA approaches availing TCE may not be a panacea for all the limitations in the design, implementation and governance of CCA, but these offer considerable added value to the policies and institutions in attaining the objectives and targets.

Capacity building includes skills up-gradation at all levels, strengthening national and sub-national civil society networks, enhancing multi-stakeholder partnerships for national coordination (see also Harmeling et al, 2011)

Barrier removal involves turning climate change scenarios and uncertainties into relevant pragmatic action plans that appeal to stakeholders, possibly with good examples of practices that inspire their support and participation

Integrating CCA and DRR and the corresponding governance implications DRR is both a short-term as well as long-term aspect of CCA, at a different scale and reflection of probabilities of events into meaningful actions to prevent, mitigate and adapt.

Barriers to adaptation have diagnosed in a few studies (see, for example, Biesbroek et al 2011, for the Netherlands) tend to obey a rather common description of impediments to EGCCA in most countries. If we have to select the most important among these barriers,
it is the one relating to effective coordination (horizontal and vertical). This calls for considerable further attention to the issues of capacity development as well design of incentives for improved performance (such as fund allocation for successive periods in relation to results / performance). This approach, however, needs considerable further development of measurable indicators and other robust metrics of performance indicators. What has been developed in the UK is a good example (as in N188 Indicators), but there is a long way to make good progress on relevant objective and robust indicators.

Adaptive capacity and autonomous adaptation including innovation require more attention than has been accorded so far in any system, since these directions offer relatively more cost effective mechanisms of attuning toward CCA.

Assumptions about future scenarios and implications for adaptation, with the roles of thresholds and non-linearities in the effects of greater climate changes, need further investigations; EGCCA can be linked with varying scales of operations and corresponding coordination of policies.

Finally, there is no valid reason to treat CCA as a stand-alone activity; it can easily be mainstreamed into various development activities and dovetailed to meet the specified and desirable objectives and targets. Governance issues need special attention to the CCA activities but not a lot more than what is required in resource allocation and utilization in an effective governance sense for the socio-economic system itself; specialized and specific interventions in CCA require appropriate attention in governance, and EGCCA approaches are useful in these systems.

References


