Chapter 8

Institutional Changes in Asia in Response to Climate Change

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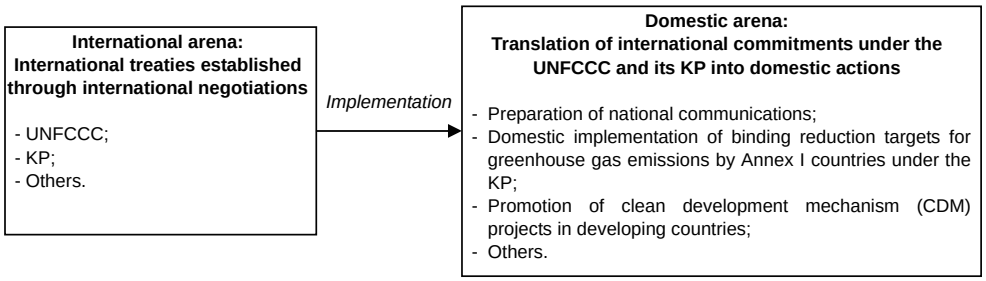
1. Introduction

Climate change is a complicated issue pertaining not only to the environment and science, but also to economics, politics and diplomacy. To address this global issue effectively requires international cooperation, domestic actions, integration across economic sectors, and the participation of multiple stakeholders and grassroots changes in human behaviour. The current global climate regime includes two correlated processes (fig. 8.1). One is to create international treaties, such as the United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol (KP), through international negotiations. The other is domestic implementation of UNFCCC and the KP by translating international commitments into concrete domestic actions to change the behaviour of target groups.

Figure 8.1. International and domestic levels of global climate regime



In response to both processes, many countries in Asia are building domestic institutions. By structuring the relationships among domestic actors and influencing their preferences in dealing with climate change, domestic institutions are important because they influence how countries implement international treaties. They also can influence the effectiveness of international efforts that alter domestic policy priorities and regulations (Kanie et al. 2004). This chapter examines national inter-agency coordination mechanisms (IACM) established to coordinate the functions of various government agencies in response to climate change, at both international and domestic levels. Several factors contribute to differing IACMs across countries such as (i) different international commitments under UNFCCC according to differentiated responsibilities and respective capabilities; (ii) varying contributions to current global greenhouse gas (GHG) emissions and therefore

different international pressures for commitment; (iii) domestic economic factors, *inter alia*, level of economic development, energy supply and mix, industrial structure, energy efficiency, energy consumption, and economy-wide impacts associated with the reduction of GHG emissions and costs to adapt to the impacts of climate change; and (iv) domestic political factors such as bureaucratic arrangements and power sharing among agencies. These factors combine to influence institutional responses to climate change, which, in turn, influence the outcomes of domestic implementation efforts.

In addition, national governments alone cannot address climate change effectively. Participation of other stakeholders, especially local governments, private sector, civil society and academia, in domestic decision making and implementation is important. Under each IACM, different countries use different measures to empower these other stakeholders to play specific roles according to social, economic and political circumstances, which may also influence the outcomes of domestic actions.

This chapter examines the evolution of IACMs in Asia and provides policy recommendations for improving their effectiveness. It focuses on (i) the structure and function of an IACM; (ii) agencies and their specific roles in IACMs; (iii) changes in IACMs and reasons for such changes; and (iv) measures to empower stakeholder participation. Five Asian countries were selected as case studies (table 8.1). Japan, the Republic of Korea (ROK), China, India and the Philippines represent different types of countries represented in the UNFCCC. Japan is the only Annex I country in Asia. China and India are the largest developing nations and are among the biggest emitters of GHGs in the world. Though a non-Annex I country, the ROK is a contrast with other developing nations due to its advanced economy and membership in the Organisation for Economic Cooperation and Development (OECD). The Philippines is considered representative of an average developing country facing daunting financial, technical and human constraints in dealing with climate change. Policy recommendations, based on success factors drawn from comparative study, are provided to improve the performance of IACMs in Asia. The objective is to identify successful practices in Asia that can be emulated by other governments considering reform of their own domestic institutions in response to climate change.

Table 8.1. Country profiles

Item	Japan	The ROK	China	India	The Philippines
Population (million -2007)	127.8[1] (12)	48.5[2] (26)	1,321.5[2] (1)	1,119.5[3] (2)	88.7[1] (14)
GDP[4] (nominal in millions current $ - 2006)	4,367.5 (2)	888.3 (12)	2,630.1 (4)	886.9 (13)	117 (47)
GDP[4] per capita (nominal in current $ -2006)	34,188 (19)	18,392 (34)	2,001 (107)	797 (133)	1,345 (118)
Total GHG emissions[5] (million tonnes of CO_2 equivalent-2005)	1,230.36 (5)	499.63 (10)	5,322.69 (2)	1,165.72 (6)	78.06 (46)
GHG emissions per capita[5] (tonnes of CO_2 equivalent-2005)	9.65 (46)	10.27 (39)	4.07 (87)	1.07 (140)	0.89 (150)

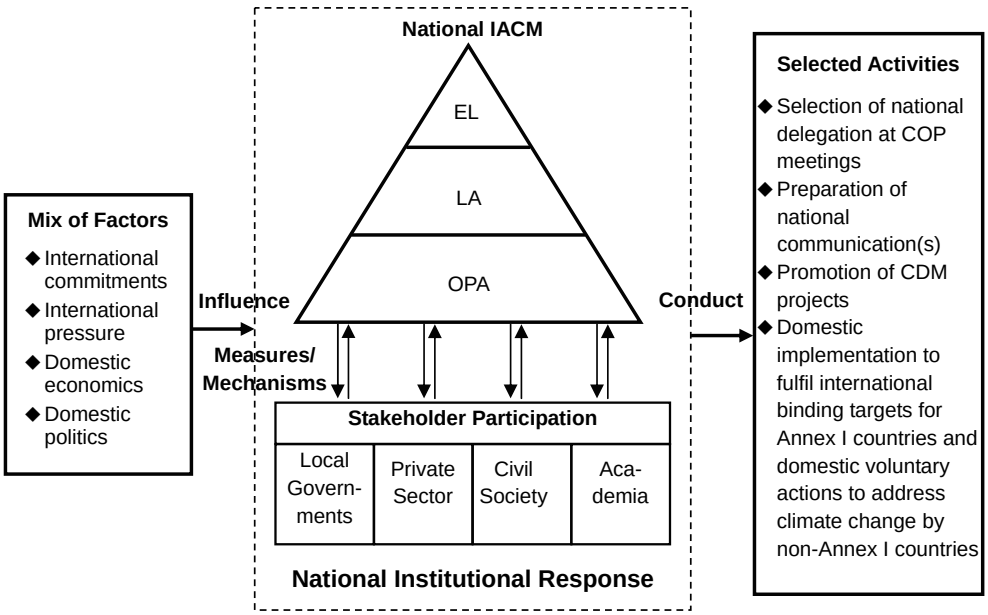
Note: Number in bracket indicates world ranking for each country.
1. Official statistics bureau; 2. Official population clock; 3. UN estimate; 4. International Monetary Fund;
5. Energy Information Administration of the United States (USEIA 2007).

Section two introduces the analytical framework for IACM arrangements. Section three summarises the five country cases, followed by a comparative study in Section four. Conclusions, policy recommendations and a future research agenda are provided in Section five.

2. Analytical framework

An analytical framework was used to examine national IACMs in terms of structure and function, division of responsibilities among relevant agencies and participation of other stakeholders (fig. 8.2). First an IACM is structured into three hierarchical strata: executive leadership (EL), leading agencies (LA) and other participating agencies (OPA). The EL represents the President/Prime Minister (or representatives on his/her behalf) executing overall coordination. The LAs include agencies playing principal roles in domestic decision-making and implementation related to climate change. The OPAs represent other agencies responsible for sectoral actions within their normal functional domains.

Figure 8.2. Structured analytical framework



Note: EL=executive leadership, LA=leading agency, OPA=other participating agency.

Second, other stakeholders in this chapter include local governments, the private sector, civil society and academia, empowered to play specific roles in domestic activities related to climate change. Local governments oversee planning processes, establish local policies and regulations, initiate local programmes and projects, and

assist in implementing national policies related to climate change. As the level of governance closest to the people, they play a vital role in educating, mobilizing and responding to the public to make grassroots changes in human behaviour. The private sector, including business and industry, contributes to national prosperity and provides major employment and livelihood opportunities. However, they are also responsible for the generation of wastes that impact on human health and the environment, and the manufacture of products that are difficult to recycle. To reduce GHG emissions, they are expected to play a crucial role by improving production systems with technologies and processes that utilise energy and other resources more efficiently and at the same time produce less wastes and GHG emissions—achieving more with less. Civil society, largely comprised of domestic nongovernmental organisations (NGO), play a vital role in the shaping and implementation of participatory democracy (Agenda 21 1992). They can act as a lobby or pressure group, assist in monitoring policy implementation, and enhance global environmental governance by increasing its transparency and accountability (Mori 2004). Academia can provide the scientific information and science and technology know-how that policymakers need in strategic policy and programme formulation. Participation of other stakeholders in an IACM and related activities, directly or indirectly, is assumed to be beneficial to IACMs.

Measures and mechanisms are examined to compare how countries empower the participation of other stakeholders and their interactions with the IACM. Such measures and mechanisms may include (i) direct representation of other stakeholders in the IACM or consultation mechanisms established under the IACM to enable the participation of various stakeholders; (ii) laws and regulations related to climate change, which define the roles and responsibilities of relevant stakeholders and regulate the behaviour of target groups; (iii) local autonomy to establish and implement local policies and programmes related to climate change; (iv) economic and financial incentives for changing production and consumption behaviour; (v) a scientific and technology research fund provided by the government; and (vi) voluntary measures for the reduction of GHG emissions by the private sector, among others.

Third, a mix of factors, *inter alia,* international commitments, international pressure, domestic economics and domestic politics, are considered to explain changes in domestic institutions over time, and differences among countries.

Fourth, to facilitate comparative study, four selected activities are examined in which the IACM together with other domestic stakeholders are involved, *viz*. (i) selection of national delegations at various meetings of the Conference of the Parties (COP) to the UNFCCC; (ii) preparation of national communications (NC) to the UNFCCC; (iii) promotion of clean development mechanism (CDM) projects; and (iv) domestic implementation to fulfil international binding reduction targets by Annex I countries and other domestic actions by non-Annex I countries to address climate change.

To ensure effective and efficient coordination among government agencies in policy-making, facilitate coherent actions, and oversee their implementation, leadership in the national IACM is important. The President/Prime Minister (or representatives on his/her behalf), with power higher than sector ministers, should function effectively as the EL. Since mitigation and adaptation are two major strands of domestic actions in accordance with the UNFCCC and its KP, government agencies with administrative functions related to mitigation and adaptation should be empowered to play key roles in the IACM. For most countries, ministries of industry/energy and environment have such

functions and should be empowered as LAs. As climate change cuts across almost all sectors, the involvement of various sectors in IACM to mobilise sectoral actions will ensure effectively coordinated decision-making and implementation. To promote grassroots change in behaviour of target groups and ensure participatory policy-making and effective implementation, other stakeholders need to be mobilised.

The hypothesis of this chapter is that an ideal IACM will feature (i) strong overall coordination by the EL; (ii) shared responsibilities between ministries of industry/energy and environment as LAs coordinating mitigation and adaptation; (iii) involvement of various sectoral agencies (as OPAs), especially those with major contributions to national GHG emissions or significantly affected by climate change and are expected to take adaptation measures; and (iv) effective mechanisms to empower participation of other stakeholders. Countries will progressively move toward this ideal modality as responsibilities for climate change response evolve.

All data and secondary information used in this study are from the internet, reviews of literature, and specific interviews conducted in the ROK and India.

3. Country case studies

3.1. Japan

Japan is the second largest economy in the world. Total GHG emissions in 2005 amounted to 1.23 billion tonnes carbon dioxide equivalent (tCO_2e), making Japan the world's fifth largest emitter (USEIA 2007). Having ratified the KP as an Annex 1 party, Japan is obliged to reduce GHG emissions by 6% below the base year, 1990, during the first commitment period, 2008-2012. Under the KP, three flexible mechanisms help Annex 1 countries to comply with their obligations: joint implementation (JI), emissions trading (ET), and the CDM.

3.1.1. Evolution of national IACM

The first Meeting of the Council of Ministers for Global Environmental Conservation (MCMGEC) was held in 1989, an *ad hoc* ministers' meeting, which served as a forum to coordinate policies on global environmental issues including climate change (table 8.2). The meeting marked the initiation of an institutional structure at the national government level to deal with climate change.

Table 8.2. Evolution of IACM in Japan

	MCMGEC (1989)	GWPH (1997)
Driving forces	Rising interest and concerns on global environmental issues among industrialised countries around 1989.	Need to deliver a single unified Japanese position to the COP3 in Kyoto, Japan in December 1997.
Legal basis for creation	Decision by the Cabinet.	Decision by the Cabinet in 1997. Re-established in 2005 based on the Law (1998).
EL	Chaired by the Prime Minister (PM) although coordination role by the PM is limited.	Although chaired by the PM, his coordination is still limited.
LAs	None.	Vice-chaired by MOE and METI.
OPAs	All ministries.	All other ministries.
Mandates/ functions	Coordination of policies regarding global environmental issues including climate change.	Overall coordination of promotion, planning, and implementation of measures to cope with global warming.
Frequency of meetings	Inter-ministerial level: 1-3 times per year; working level: more frequent, as appropriate.	Inter-ministerial level: 1-3 times per year; working level: more frequent, as appropriate.
Salient features	Bottom-up policy formulation process, starting from involved ministries to the Council level.	Following deliberations with pertinent ministries, GWPH has final authority on adoption of policies and measures.

Note: EL=executive leadership, LA=leading agency, OPA=other participating agency, MCMGEC=Meeting of the Council of Ministers for Global Environmental Conservation, GWPH=Global Warming Prevention Headquarters, MOE=Ministry of Environment, METI=Ministry of Economy, Trade and Industry.

In 1997, pursuant to a Cabinet decision, the Global Warming Prevention Headquarters (GWPH), an inter-ministerial council, was established. The GWPH is mandated to coordinate strategies relating to organisational setup, policy formulation, and guidelines and action plans on climate change. The GWPH is chaired by the Prime Minister and vice-chaired by the Chief Cabinet Secretary, Minister of Environment, and Minister of Economy, Trade and Industry. All other ministers are also members of the GWPH, although the Minister of Justice and Minister of Labour were not members at its initiation in 1997. Since the Japanese national policy formulation process is bottom-up from the ministries, there have been no top-down measures by the MCMGEC or the GWPH such as allocation of targets and burdens after discussion in the inter-ministerial meeting. In October 2007, the Government of Japan also set up a seven ministers' meeting (Minister of Foreign Affairs, Minister of Finance, Minister of Agriculture, Forestry and Fisheries, Minister of Economy, Trade and Industry, Minister of Land, Infrastructure and Transport, Minister of Environment, and the Chief Cabinet Secretary) on domestic measures for global warming prevention to discuss revision of measures to achieve the reduction target set by the KP commitment. Moreover, the Prime Minister's office established an Advisory Panel on Climate Change in February 2008 to discuss various issues regarding the pathways to develop a low-carbon society and Japan's contribution to the global community. The panel comprises 12 experts from various fields including the industrial sector, NGOs, academia and local governments (Japan for Sustainability 2008).

In 1998, the *Law Concerning the Promotion of Measures to Cope with Global Warming* (the Law) was promulgated to determine the national framework to cope with global warming. Subsequently, *Guidelines for Measures to Prevent Global Warming* (the Guidelines) was formulated to provide concrete policies and measures to achieve the KP targets. In the same year, the *Law Concerning the Rational Use of Energy* was

revised. In 2003, the *Renewable Portfolio Standard Law* was put into force to promote the supply of the electricity generated from renewable energy. In 2005, *the Kyoto Protocol Target Achievement Plan* (the Plan) was formulated. There are also other laws which are not necessarily formulated or revised mainly to cope with climate change, but are listed as measures to achieve the Plan targets.

Formulation of the Guidelines and the Plan began with a draft prepared by the concerned ministries. The drafts were discussed in government councils, with the lead taken by the Ministry of Economy, Trade and Industry (METI) and the Ministry of Environment (MOE) and open to the public including the media. Following these public hearings, the GWPH Steering Committee then drafted the final Guidelines, and coordinated publication. For the Plan, however, the Cabinet approved and published it, in accordance with the Law (1998).

The Japan Council for Sustainable Development was established in 1996 as a multi-stakeholder forum for the national and local governments, industry and business, and civil society organisations, among others, to follow up Agenda 21 and achieve domestic sustainable development. However there is no apparent linkage between the Council and the GWPH.

3.1.2. Stakeholder participation

Following national policies on climate change, all 47 prefectures and several hundred municipalities prepared local action plans on climate change to reduce GHG emissions attributable to the daily operation and maintenance of government offices. In addition, 47 prefectures and several dozen municipalities developed local action programmes to reduce GHG emissions generated in their jurisdiction. However local reduction targets are not explicitly linked with national targets (table 8.3). For local action programmes, 18 prefectures set local targets for GHG emissions reduction higher than the national target, which is 6% reduction in 2010 (base year 1990). Fourteen prefectures set their targets lower than 6% and another 14 prefectures set 6% reduction of GHG emissions as their target. One prefecture set its target based on per capita reduction of GHG emissions rather than total reduction in emissions.

The role of the private sector in Japan is significant and rather unique in its reaction to climate change. In 1997, the Nippon Keidanren (Japan Federation of Economic Organisations) prepared an Environment Voluntary Action Programme which outlines various business initiatives to cope with climate change and improve waste management. As of February 2008, 61 business organisations participate in the programme and each has set targets on energy intensity improvement or annual reduction of GHG emissions. Progress in most business organisations is self-reviewed annually and then reported to the government councils for their review, pursuant to the Guidelines (1998). There is also significant industry representation in government councils established by various ministries, especially in the council hosted by METI. In addition to the actions under the voluntary programme, companies also try to address climate change through corporate social responsibility (CSR) activities, as illustrated by Toyota Motor Company's support of forest plantations.

Table 8.3. Actors in selected activities related to climate change in Japan

Activities	Actors and their roles
Selection of national delegation at COPs	MOFA decides on the composition of official delegation; most participants from MOE, METI, MOFA, MOAFF and MOLIT; no representatives from local governments, private sector and civil society but some from academia.
Preparation of national communications (NC)	MOE coordinated contribution of ministries; MOFA submitted four NCs to UNFCCC Secretariat (1994, 1997, 2002 and 2006); GHG inventory prepared by GHG Inventory Office of Japan and NIES under supervision of MOE while METI, MOLIT, MOAFF, MOE and MOSWL provided data; local governments and industrial associations of electricity, coal, cement, steel and paper sectors provided data for GHG inventory; Japanese individuals and organisations submitted public comments on draft NCs.
Promotion of CDM projects	The Liaison Committee for the Utilisation of the Kyoto Mechanism is the DNA. Project documents submitted to the Liaison Committee are appraised by several ministries according to their jurisdiction: e.g. energy related projects go to METI while "sinks" projects go to MOAFF. MOE and METI designated the New Energy and Industrial Technology Development Organisation (NEDO) to purchase Kyoto credits on the country's behalf through emission reductions purchase agreements (ERPA). Energy, manufacturing and trade companies are actively involved as project developers. Power companies and other private companies have participated in the Prototype Carbon Fund of the World Bank and Japan GHG Reduction Fund in partnership with government financial institutions. As of February 2008, 275 projects were approved by the DNA, with an estimated reduction of 198 million tCO_2e/yr; major host countries: China (43.4%), Brazil (8.7%) and India (7.3%); 123 projects were registered by the Executive Board of the Clean Development Mechanism (CDM-EB).
Domestic implementation of international binding reduction target for GHG emissions	Major national policies include (i) *Law Concerning the Promotion of Measures to Cope with Global Warming;* (ii) *Law Concerning the Rational Use of Energy* (revised in 1998); (iii) *Guidelines for Measures to Prevent Global Warming*, and (iv) *Kyoto Protocol Target Achievement Plan*. Local action plans for the reduction of GHG emissions from government offices were developed by all 47 prefectures and 663 municipalities out of 1,821. As of March 2006, local action programmes for the reduction of local GHG emissions were developed by all prefectures and 60 municipalities. Civil society, including academia, has been involved in policy-making process at local levels. Japan Centre for Climate Change Action and its prefectural centres partner in local implementation. The major business association, the Nippon Keidanren, developed voluntary emissions reduction programmes. Academia contributed to policy formulation through government councils while other civil society members have been involved in local environmental education initiatives. In 2005, GHG emissions were 7.8% higher than 1990 though the target is a 6% reduction; industry reduced emissions by 5.5% while transport, commercial and residential sector emissions increased by 18.1%, 44.6%, and 36.7%, respectively.

Note: MOFA=Ministry of Foreign Affairs, MOAFF=Ministry of Agriculture, Forestry and Fisheries, MOLIT=Ministry of Land, Infrastructure and Transport, MOSWL=Ministry of Social Welfare and Labour, NIES=National Institute for Environmental Studies, DNA=designated national authority.

Researchers in academia have been significantly involved in policy formulation through participation in government councils and, in particular, in the council under MOE. A few NGOs contribute to the 40-member council under MOE, and there is one NGO member out of the 29 seats in the council administered under METI. The smaller number of NGOs in Japan compared with the United States or European countries, especially those which are providing policy advice to governments at various levels, might contribute to the comparatively limited role that NGOs play in domestic policy-making on climate change. Nevertheless, civil society has contributed to local planning and implementation through the activities of the Japan Centre for Climate Change Action and its prefectural centres.

3.2. The Republic of Korea

The ROK ranks 12th (2006), 10th (2005) and 39th (2005) in terms of GDP, total GHG emissions and GHG emissions per capita, respectively, in the world (IMF 2007; UNSD 2007; USEIA 2007). Energy and manufacturing account for 94.3% of total GHG emissions. As one of world's top emitters with OECD membership but a non-Annex I party, the ROK has been under growing international pressure to make a binding GHG reduction commitment. Energy security and corporate competitiveness are major national concerns, among others, related to climate change.

3.2.1. Evolution of national IACM

In response to the Rio Summit, the Ministerial Committee on Global Environment was established in 1992, covering various topics including climate change.[1] Global environmental issues had been treated as separate issues by corresponding ministries. Since its establishment, there had been no urgent issue for the Committee to call upon an inter-ministerial meeting. This Committee was then abolished in 1996. However, after the adoption of the KP in 1997, the ROK recognised the economic implications of the KP and saw an urgent need to set up a separate national institution to deal with climate change. In April 1998, the Inter-Ministerial Committee (IMC) on UNFCCC (table 8.4) was established, chaired by the Prime Minister. The IMC has four levels: ministers (12), vice-ministers (12), directors-general (DG), and five task forces (negotiation, energy/industry, environment, agriculture and forestry, and research and development [R&D]). The IMC is supported by an expert pool including nine government-affiliated institutes and others. The IMC was expanded in September 2001 to include a new Task Force on General Coordination led by the Office for Government Policy Coordination (OGPC), a ministerial-level body assisting the Prime Minister in policy coordination, evaluation and regulatory reform. The IMC will be restructured in 2008 to remove the duplication of the vice-ministers' working council and to further strengthen the OGPC in overall coordination. The task forces are now streamlined into four areas to implement the fourth national action plan (NAP): negotiation, mitigation, adaptation, and R&D.

In addition, a Presidential Commission on Sustainable Development (PCSD), a standing body that provides advice to the President, was established in 2000 based on the political philosophy and management of government affairs during the presidency of Kim Dae Jung (1998-2002). The PCSD has a broader scope and function than the IMC and, perhaps illogically, works independently from it. The new President, Lee Myung Bak, took office in December 2007. The new government has emphasised turning the climate change crisis into an opportunity for national economic growth. This indicates that the response of the new government to climate change may be more proactive. So far, however, there has been no change in national institutional arrangements related to climate change.

Table 8.4. Evolution of IACM in the ROK

	IMC (1998)	IMC (2008)
Driving forces	Kyoto Protocol; implementation of first national action plan (NAP) (1999-2001).	Implementation of fourth NAP (2008-2012).
Legal basis for creation	Prime Minister's Order.	Prime Minister's Order.
EL	Prime Minister as chair and OGPC providing overall coordination.	Prime Minister and OGPC providing overall coordination.
LAs	MOCIE, MOE and MOFAT are lead agencies in energy/industry, environment and negotiations; MOCIE plays key role.	MOCIE, MOE, MOFAT and KMA are lead agencies in four priority areas: mitigation, adaptation, negotiation, and R&D.
OPAs	Includes finance, public affairs, science & technology, agriculture & forestry, construction, maritime affairs, planning & budget, and information agencies.	N/A.
Mandates/ functions	To (i) make consistent climate policies (ii) minimise negative impacts of UNFCCC on Korea's economy and develop diverse negotiation strategies (iii) promote concrete measures on mitigation and (iv) implement NAPs.	In addition to existing mandates, to establish an integrative responsive mechanism of mitigation and adaptation.
Frequency of meetings	Ministerial level and vice-ministerial level: once every three years; DG level: once a month.	N/A.
Salient features	Complicated hierarchical structure with a supportive expert pool.	Involvement of local governments.

Note: EL=executive leadership, LA=leading agency, OPA=other participating agency, NAP=national action plan, OGPC= Office for Government Policy Coordination, MOCIE=Ministry of Commerce, Industry and Energy, MOE=Ministry of Environment, MOFAT=Ministry of Foreign Affairs and Trade, KMA=Korea Meteorological Administration, N/A=not available, DG=director-general.

3.2.2. Stakeholder participation

To date, local governments (table 8.5) have played a limited role in climate related activities in the ROK, although they have been actively involved in the promotion of local sustainable development. In 2003 all 16 regional governments and 164 out of 232 local governments developed their Local Agenda 21 (Korean Council for Local Agenda 21 2008). Domestic activities related to climate change have been initiated by the national government and the major role of local governments is delivering national policies into their localities. This may be partly due to a long history of strong national government in the ROK and a relatively short history of local autonomy. Nevertheless, local governments have put great effort into energy policies and transportation issues though not necessarily linked with climate change. Recently local governments have recognised the importance of climate change policies and are trying to develop concrete action plans in response to climate change. During the IMC restructuring in 2008, a Conference of Local Governments will be established to provide a channel for local government participation in decision-making and in implementation of NAPs.

For the private sector, the Industrial Committee on Measures for the UNFCCC was established in 2001. Industry also contributed to the completion of Korean National Communications by establishing a GHG database and providing research funding and technical assistance to the national GHG inventory. The private sector has also developed voluntary agreements in the implementation of NAPs.

Table 8.5. Actors in selected activities related to climate change in the ROK

Activities	Actors and their roles
Selection of national delegation at COPs	Three key ministries: MOFAT, MOCIE and MOE; MOE's minister as head of national delegations at COP; MOCIE's Senior Coordinator for Environment and Science as head of national delegations at SBSTA/SBI and MOFAT coordinating and synthesizing national positions; no representation from local government, private sector or civil society; participation of academia, however, has increased dramatically since COP4 with a share of more than 20%.
Preparation of national communications (NC)	OGPC is in charge of NCs but delegated action to KEEI of MOCIE; a research team was organised comprising 7 ministries, 4 government-affiliated institutes and 1 state-owned enterprise; private sector established a GHG database; some companies offered research funding and technical assistance to the national GHG inventory; two NCs submitted to UNFCCC in 1998 and 2003, respectively.
Promotion of CDM projects	DNA is the CDM Review Committee under the IMC, chaired by OGPC with members from foreign affairs, science and technology, agriculture and forestry, environment, public affairs and others. OGPC coordinates the approval process. KEMCO of MOCIE provides technical support to local governments and the private sector for the preparation, implementation and monitoring of CDM projects. As of February 2008, 17 projects were registered by CDM-EB and more than half are unilateral CDM projects. As of December 2007, 41 CDM projects were approved by DNA.
Other domestic voluntary actions related to climate change	Three NAPs (1999-2001, 2002-2004, 2005-2007) prepared and implemented by IMC; agencies initiated project proposals, OGPC screened and coordinated proposals, then ministerial committee of IMC gave final approval of NAPs. Priorities of the 1st and 2nd NAP were (i) system construction in response to the UNFCCC and; (ii) development of technologies and measures on GHG reduction. The 3rd NAP prioritised impact assessment and adaptation; priorities of the 4th NAP are shifting to mitigation and technology development. Local governments were not included in past decision-making processes or in NAPs, but will be included in the 4th NAP (2008-2012). About 36 projects were implemented in 1st NAP, 84 in 2nd NAP and 91 projects in 3rd NAP.

Note: SBSTA=Subsidiary Body for Science and Technology, SBI=Subsidiary Body for Implementation, NC=National Communication(s), KEEI=Korea Economy and Energy Institute, DNA=designated national authority, KEMCO=Korea Energy Management Corporation, CDM-EB=Executive Board of the Clean Development Mechanism, NAP=national action plan.

NGOs play a limited role in climate change responses in the ROK, although they are represented in many environment-related committees. A "Policy Conference for Environmental NGOs" consisting of more than 20 NGOs was established and meets three to four times a year to discuss current environmental issues and policies. The Government provides limited financial support for environmental NGOs and supports a variety of events. However, in the IMC and climate change responses, a Government-NGO consultation mechanism has not been established to date.

Academia plays a very active role in climate related activities. Government-affiliated institutes together with other private institutes form an expert pool to the IMC providing technical support to the Government in the decision-making process. Of the ROK's national delegation at COPs, up to 20% of total delegates came from government-affiliated and other institutes. For the preparation of two national communications, the Korea Energy Economics Institute (KEEI), which is affiliated to the Ministry of Commerce, Industry and Energy (MOCIE), was delegated by the OGPC to organise government agencies and institutes and to coordinate the work.

3.3. China

Attributable to its rapid economic growth since the early 1980s and with the largest population in the world, China became the second largest GHG emitter in 2005. However, 47% of the population still live in poverty (World Bank 2006c) and GHG emissions per capita ranked 87th, less than the world average (USEIA 2007). Playing an important role in the "G77 plus China" and being one of top GHG emitting countries, China has been under pressure from developed countries in the UNFCCC to undertake stronger commitments. In recent years, the Government made a change in development strategy advocating a *Scientific Approach of Development and Building of Resource Conservation and Environmentally Friendly Society*. This may lead to a more proactive attitude to addressing climate change.

3.3.1. Evolution of national IACM

In 1990, China established its first IACM to coordinate participation in IPCC-related work and international negotiations (NCCCC 2007a). The State Meteorological Administration, a weak agency in China's bureaucratic system, played the leading role together with the Ministry of Foreign Affairs (MOFA). Climate change was perceived primarily as a scientific issue and an issue of international relations.

In 1998, a new IACM, the National Coordination Committee on Climate Change (NCCCC) was established (table 8.6), chaired by the State Development and Planning Commission (SDPC), a macroeconomic management agency above the ministry level. This IACM coordinated climate policies, activities related to climate change and matters related to international negotiations, while significant decisions were made by the State Council. Other lead agencies included foreign affairs, meteorology, science and technology, and the environment. The IACM was expanded in 2003, increasing its members from 7 to 12.

To address change in development approach, climate change and other domestic environmental issues, China set two mandatory domestic targets on energy intensity (20% reduction) and emissions reduction of major pollutants (10%) for 2006-2010 (State Council 2006). In June 2007, to strengthen implementation, the State Council established an inter-ministerial leading group, chaired by the Premier (State Council 2007). This IACM has external functions related to the UNFCCC and internal functions related to domestic implementation of the two targets. Externally, the National Development and Reform Commission (NDRC, successor of SDPC) is the lead agency, together with foreign affairs, science and technology, environment and meteorology agencies. For internal functions, the NDRC and the State Environmental Protection Administration (SEPA, since March 2008, upgraded to Ministry of Environmental Protection) are the leading agencies coordinating energy conservation and emissions reduction, respectively. Potential changes in the new ministry's responsibilities in the national IACM were not yet available when writing this chapter.

China has not established a national council on sustainable development. However, the State Council delegated relevant responsibilities to the NDRC and the Ministry of Science and Technology (MOST) as two lead agencies coordinating other agencies in activities related to sustainable development. On 25 March 1994, the Administrative Centre for China's Agenda 21 was established, a governmental organisation affiliated to the then State Science and Technology Commission (predecessor of MOST), to be

responsible for implementation of projects under China's Agenda 21. Although the NDRC and MOST are also LAs in the current IACM, the establishment of the climate change IACM and its evolution are separate from national institutional arrangements for sustainable development. How the NDRC and MOST harmonise their functions related to climate change and sustainable development within each agency needs to be investigated further.

Table 8.6. Evolution of IACM in China

	NCCCC (1998)	**NCCLG/NECERLG (2007)**
Driving forces	(i) Government restructuring in 1998; and (ii) need to strengthen coordination by replacing SMA by the SDPC.	(i) Increasing international pressure; (ii) political change in development strategy; and (iii) need to strengthen integrated implementation of two domestic mandatory targets.
Legal basis for creation	State Council Notification during government restructure in 1998.	State Council Notification No.18 (2007)
EL	No representation from the State Council.	Premier as chair, Vice Premier and State Councillor as vice-chairs.
LAs	Executive Office at the SDPC with SDPC as Chair; MOFA, CMA, MOST, SEPA* and MOF coordinating five specific areas: (i) COP delegation; (ii) IPCC participation; (iii) implementation of CDM; (iv) EIA; and (v) GEF-related work.	Executive Office at NDRC; external function related to the UNFCCC: led by the NDRC with MOFA, MOST, SEPA and CMA; internal function on energy conservation and emissions reduction: led by the NDRC and SEPA.
OPAs	Seven agencies: economy and trade, construction, water resources, transportation and communication, academy of science, forestry, and maritime affairs.	Another 22 agencies.
Mandates/ functions	To (i) improve China's capacity to implement the UNFCCC; (ii) contribute to China's sustainable development; (iii) frame national interests in negotiations; and (iv) build consensus in climate policy making among agencies.	To (i) study and draft significant national strategies, principles and countermeasures addressing climate change; (ii) study and review China's strategy for international negotiations; and (iii) implement energy conservation and emissions reduction.
Frequency of meetings	Twice a year before and after each COP (Bjørkum 2005).	No available–one meeting chaired by the Premier in July 2007 after its creation in June 2007 (NDRC 2007).
Salient features	Stronger and more stable than previous mechanism, led by powerful macroeconomic agency with distinct division of responsibilities among agencies; role of SEPA is insignificant.	Stronger overall coordination led by the Premier emphasizing the implementation and enforcement of domestic mandatory targets.

* SEPA was upgraded to ministerial level in March 2008, titled the Ministry of Environmental Protection.
Note: EL=executive leadership, LA=leading agency, OPA=other participating agency, NCCCC=National Coordination Committee on Climate Change, NCCLG/NECERLG=National Climate Change Leading Group/National Energy Conservation and Emission Reduction Leading Group, SMA=State Meteorological Administration, SDPC=State Development and Planning Commission, MOFA=Ministry of Foreign Affairs, CMA=China Meteorological Administration (successor of SMA), MOST=Ministry of Science and Technology, SEPA=State Environmental Protection Administration, MOF=Ministry of Finance, NDRC=National Development and Reform Commission, EIA=environmental impact assessment.

3.3.2. Stakeholder participation

In accordance with the national directive, provincial governments have issued local regulations and a few of them set up provincial inter-agency coordination mechanisms, with similar composition to the national IACM (table 8.7) (NCCCC 2007b). To enforce implementation of the two mandatory targets, the Government established a target responsibility system and performance assessment system. Local governments at each level (province, county and township) signed the target-responsibility agreement with their higher tier government and their performance is inspected and assessed annually. The results have been used to evaluate the political performance of local governors. CDM promotion centres have been established in 22 provinces to support the preparation of project design documents and provide relevant training (Kyoto Mechanisms Information Platform 2007).

Table 8.7. Actors in selected activities related to climate change in China

Activities	Actors and their roles
Selection of national delegation at COPs	NDRC, MOFA and MOST are playing the more important roles in cooperation with CMA, SEPA*, MOA and SFA. Majority from NDRC but MOFA leads and coordinates negotiations; MOST with increasing role related to CDM; no representatives from local government, private sector, or civil society, but academia increased sharply since COP6 (more than 35%).
Preparation of national communications (NC)	Project Steering Committee established by IACM including NDRC, MOFA, MOST, MOF, SEPA and CMA; Executive Office, along with Project Management Office at NDRC; local governments and private sector with limited participation in GHG inventory project; no participation from civil society; six government-affiliated research institutes joined national GHG inventory project; initial NC submitted by IACM in December 2004.
Promotion of CDM projects	IACM coordinates CDM policies. NDRC as DNA gives final approval of projects. CDM Board under IACM include NDRC and MOST as co-chairs, MOFA as vice-chair and SEPA, CMA, MOF and MOA as members, responsible for the review of projects while *"Measures for the Operation and Management of Clean Development Mechanism Projects"* was issued jointly by NDRC, MOST, MOFA and MOF, based on which a levy system on CERs was established to promote projects on (i) energy efficiency; (ii) new and renewable energy; and (iii) methane recovery and utilisation. China CDM Fund was set up with Management Centre at MOF in August 2006. CDM promotion centres in 22 provinces established. Experts and institutes provide technical support in the CDM review process. By February 2008, 162 projects were registered by CDM-EB, 28 projects obtained CERs and 1,113 projects were approved by DNA.
Other domestic voluntary actions related to climate change	Major measures adopted by the Government: (i) legislation, national and sectoral plans and programmes, including the National Climate Change Programme to provide guidance and set targets for priority areas; (ii) enforcement of two mandatory targets providing 40 measures, including financial mechanisms, such as energy conservation criteria for obtaining loans and pricing system for renewable energy; and (iii) target responsibility system; national mandatory targets divided into local targets. Provincial governments issued local regulations, developed action plans and set up implementation institutions. NDRC signed target responsibility agreements with 1,000 energy intensive enterprises to enforce energy conservation in 2006. Among other activities, eight environmental NGOs published a report on actions for combating climate change. Forty NGOs launched "20% Energy Saving Citizen Actions" in 2007 to raise public awareness. Academia promotes energy saving R&D, monitoring and observation infrastructure and fostering human resources.

* SEPA was upgraded to ministerial level in March 2008, titled the Ministry of Environmental Protection.
Note: NDRC=National Development and Reform Commission, MOFA=Ministry of Foreign Affairs, CMA=China Meteorological Administration, MOST=Ministry of Science and Technology, SEPA=State Environmental Protection Administration, MOF=Ministry of Finance, SFA=State Forestry Administration, MOA=Ministry of Agriculture, DNA= designated national authority, CER=certified emission reduction, CDM-EB=Executive Board of the Clean Development Mechanism.

The private sector accounts for 70% of national energy consumption (NDRC and NBSC 2007). The mandatory targets are disaggregated into sectoral and local targets and further into the targets of major energy-intensive enterprises and large emitters. The NDRC selected 1,000 enterprises, whose energy consumption accounted for 50% of total industrial energy consumption and, in 2006, signed target responsibility agreements with them.

In general, independent civil society in China is weaker compared with the other four countries examined here. However, civil society groups working in the area of the environment are more active than in other areas. The challenges of climate change have aroused the attention of China's civil society groups but so far they have not played a major role. A few domestic NGOs and local offices of international NGOs have carried out various projects to address climate change and participated in UNFCCC meetings (NCCCC 2007c).

Academia, especially government-affiliated institutes, plays an active role in most climate-related activities (MOST et al. 2007). Academic institutes have made significant contributions including (i) one third of the national delegation at COPs and preparation of negotiation positions; (ii) climate change R&D; (iii) IPCC related work (including four Assessment Reports); (iv) pilot stage of implementing CDM and review of CDM projects for domestic approval; and (v) preparation of national communications.

3.4. India

At 1.1 billion, India ranks second in world population, with an annual average population growth rate of 1.7% (World Bank 2007). From a total land area of 3.28 million square kilometres, 61% is used for agriculture. In 2006, GDP was $886.9 billion (IMF 2007) with an annual growth rate of 8.4% (World Bank 2006). With emissions measured at 1.07 tCO_2e/cap (USEIA 2007), India ranked sixth among the largest global emitters of GHGs in 2005. In spite of being one of the ten fastest-growing economies in the world, per capita GDP remains one of the lowest with about one-fourth of India's population below the poverty line. Only 55% of Indian households have access to electricity (Ray 2007). With a high population density, India is vulnerable to climate change impacts, especially in coastal areas. As a non-Annex 1 party to the UNFCCC, it is only required to submit NCs. Based on the 1994 GHG Inventory, CO_2 accounts for 65% of total GHG emissions, and the energy sector accounts for almost two-thirds of CO_2 emissions (MOEF 2004).

3.4.1. Institutional arrangement

The Ministry of Environment and Forests (MOEF) is responsible for planning, promotion, coordination, and overseeing implementation of environment and forestry policies and programmes. The National Environment Council—chaired by the Prime Minister with members including senior representatives of central ministries, chief ministers of states, representatives of NGO groups, and distinguished scientists and academics—is the highest policy-making body on environmental issues (UN DESA 2007). Prior to 2007, India had not set up an IACM comparable with other countries in this study (table 8.8). A Climate Change Division within MOEF carried out the function of the DNA for the CDM and various sectoral plans and programs on both adaptation and mitigation initiatives were also adopted and implemented. However, before the G-8

Summit and on World Environment Day in June 2007, the Government announced the establishment of a Prime Minister's Council on Climate Change (PMCCC) (MOEF and MOP 2007). The PMCCC is comprised of official and non-official members. Additionally, in March 2008 the Prime Minister announced that a permanent negotiating team is to be created within the PMCCC (The Indian Express 2008).

Poverty reduction and economic growth are the prime objectives of India's national development strategy. These objectives have been consistently emphasised in the country's successive five-year plans (FYP), which provide the medium-term strategies for overall development and are prepared by the Planning Commission of India under the overall guidance of the National Development Council. To support economic growth under the 10th FYP (2002-2007), India has focused on energy supply and improving access to clean and modern fuels. India's economy has grown at a rate of over 9% per year but energy intensity has been reduced since 2004. The Government intends to further improve these areas by promoting sustainable patterns of consumption, enhancing competitiveness, promoting energy efficiency, and using CDM to promote clean energy technologies (MOEF and MOP 2007).

Table 8.8. Creation of IACM in India

	Prime Minister's Council on Climate Change (2007)
Driving Forces	The need for India to review, consolidate and articulate climate change mitigation and adaptation strategies; release of the Fourth IPCC Assessment Report.
Legal basis for creation	Prime Minister's Directive of 7 June 2007 creating a high-level advisory panel on climate change.
EL	Prime Minister's Office.
LAs	MOEF, MOP, and Principal Scientific Advisors to the Prime Minister.
OPAs	MEA, MOST, MA, MWR, MOF, Planning Commission, and private sector through economic councils.
Mandates/ functions	To provide strategic guidance on mainstreaming climate change in development, identify key intervention priorities, and formulate a National Action Plan on Climate Change.
Frequency of meetings	At least 4 times before the COP delegation left for the 2007 COP13 meeting.
Salient features	Multi-stakeholder representation - non-official members include credible personalities from civil society and the mass media.

Note: EL=executive leadership, LA=leading agency, OPA=other participating agency, MOEF=Ministry of Environment and Forests, MOP=Ministry of Power, MEA=Ministry of External Affairs, MOST=Ministry of Science and Technology, MA=Ministry of Agriculture, MWR=Ministry of Water Resources, MOF=Ministry of Finance.

The Eighth Energy Sector Plan (1992-1997) promoted energy conservation, which has contributed to the declining energy intensity of industry and transport sectors. The introduction of the "Bharat 2000" contributed to the upgrading of vehicular emission standards and promoting low or no-carbon emitting vehicles. Introduction of compressed natural gas was a major factor in air quality improvement. In agriculture, standardisation of fuel-efficient pump sets, rationalisation of power tariffs, and better cultivation practices to reduce nitrous oxide emissions were undertaken. In the residential sector, LPG stoves, compact fluorescent lamps, and fuel-efficient pumps for lifting water in high-rise buildings, have been promoted. The Energy Conservation Act 2001 created a Bureau of Energy Efficiency to facilitate and enforce efficient use of energy. Rationalisation of coal use, pricing reforms, technology upgrading, promotion of new and renewable energy forms, promotion of fuel efficiency and conservation

through reduction of gas-flaring, installation of waste-heat recovery systems, energy audits, equipment upgrades, and substitution of diesel with natural gas all contributed to India's mitigation efforts. The Electricity Act, 2003 has led to an acceleration of renewable electricity capacity addition (MOEF and MOP 2007). In 2006, an energy labelling system for appliances was introduced. In 2007, the Energy Conservation Building Code directs the designers of new, large commercial buildings to optimise energy demand.

During the opening address of the Delhi Sustainable Development Summit in February 2008, the Prime Minister of India listed various adaptation measures among the priority areas of the country which include large scale afforestation, drought-proofing, protection of the glacial systems and coastal areas as safeguards against the hazards of climate change (Merinews 2008).

3.4.2. Stakeholder participation

India is the largest democracy in the world; a federal political system with the President as the head of state elected by members of the central and state assemblies for a five-year term. The executive function rests with the Prime Minister who presides over the Council of Ministers. The legislative branch is bicameral, comprised of the House of the People (*Lok Sabha*) and the Council of States (*Rajya Sabha*). With a strong judiciary and Supreme Court, environmental issues in India are of high importance, and are taken up aggressively by the powerful media and an active NGO community. In preparing the first NC, a broad participatory approach was adopted with 131 research teams drawn from research and technical institutions, universities, government departments and NGOs (MOEF 2004) (table 8.9) .

Table 8.9. Actors in selected activities related to climate change in India

Activities	Actors and their roles
Selection of national delegation at COPs	The COP8 meeting in New Delhi ushered in more NGO participation. Research institutions under the environment agencies are usually represented, with other government representatives coming from foreign affairs and sometimes from industry agencies.
Preparation of national communications (NC)	The environment agency takes the lead but local government contributes to data collection. Civil society has mostly contributed to capacity building initiatives.
Promotion of CDM projects	MOEF is the DNA in charge of all matters pertaining to CDM projects, but state governments have established CDM promotional cells to encourage submission of CDM project proposals; the private sector assists in information dissemination on CDM rules; NGOs conduct capacity building, and academia participates in technical evaluation of project concept notes and proposals.
Other domestic voluntary actions related to climate change	At the state level, power sector reform began by transferring tariff fixing powers to independent regulators to encourage private sector participation. Energy agencies mobilise participation of local institutions, NGOs, and village-level organisations to implement non-conventional energy programmes. Private sector participation is encouraged in operation of public transit providers. The Indian Refining Industry has increased use of more efficient equipment and technology. Indian coal companies are planting mined-out areas to contribute to adaptation efforts. On various energy conservation and efficiency programs, NGOs have been actively participating in state assembly forums. Research institutions are engaged in climate science research and modelling.

The Constitution Amendment Act of 1992 ushered in a decentralised approach to development planning. Consequently, under India's 8th FYP (1992-1997) and 9th FYP (1997-2002), social mobilisation and participation of people at all levels were recognised as means to ensure environmental sustainability of the development process (UN DESA 2007). The 10th FYP (2002-2007) on the other hand, paved the way for the formation of what is now popularly known in India as self-help groups.

The states of Andhra Pradesh, Madhya Pradesh and West Bengal have established CDM promotional cells to facilitate submission of CDM project proposals. The private sector has assisted in increasing capacity of Indian industry on issues such as cleaner production options, ISO 14000, green ratings, greening supply chains, environmental legislation and energy auditing. The Federation of Indian Chambers of Commerce and Industry has established an Environmental Information Centre to enable Indian industry to become more environmentally responsible and competitive. NGOs have also played an important role in awareness-raising and in empowering communities and women by facilitating self-help groups at the grassroots level. Research institutions have been active in the outreach component of climate change initiatives in India. Indian scientists have contributed to national and international climate research efforts such as the International Indian Ocean Expedition, Monsoon Experiment, Indian Ocean Experiment, World Climate Research Programme, Global Observing System, and the International Geosphere-Biosphere Programme (MOEF 2004).

3.5. The Philippines

The Philippine archipelago has a land area of 299,764 square kilometres. In 2007, the population was 88.7 million with an average growth rate of 1.9% (NSCB 2007). GDP has been growing steadily from 3.0% in 2001 to 5.1% in 2005 (ADB 2006). Poverty incidence remains high at 33% in 2000 (NSCB 2007). A growing consumer of energy, particularly electric power, the key growth drivers of the economy are attributed mainly to the services sector. Per capita emissions were 0.89 tCO_2e/yr in 2005 (USEIA 2007) and emissions growth was 43% from 1990-2003 (World Bank 2007). Almost 50% of GHG emissions come from the energy sector. In the first national communications to the UNFCCC, the national GHG inventory reported that the Philippines released 100,738 $ktCO_2e$, associated with four main sectors: energy (49%), industry (11%), agriculture (33%), and land wastes (7%). Being a tropical archipelago, the country is highly vulnerable to the impacts of climate change, particularly for agriculture and food security.

3.5.1. Evolution of national IACM

Even before becoming a party to the UNFCCC, the Philippines created an Inter-Agency Committee on Climate Change (IACCC) to coordinate all climate change related activities (table 8.10). The IACCC facilitated preparation of the country's first NC under the lead of the Department of Environment and Natural Resources (DENR), which was also assigned as the DNA for CDM in 2004.

In 2007, a Presidential Task Force on Climate Change (PTFCC) was established, which in effect replaces the IACCC as the lead coordinating body on climate change matters. Under this new arrangement, the IACCC was made the technical arm of the PTFCC and other agencies have been designated to assist the PTFCC. The PTFCC is

chaired by the DENR. Following its first meeting in June 2007, an Advisory Council to the PTFCC was created, chaired by the DENR Secretary, co-chaired by the Presidential Adviser to Land Reform, and with six members from academia and NGOs. All bureaus and offices of the DENR are required to provide assistance to the Council and the Environment Management Bureau has been instructed to allocate the necessary funding for the Council's operation.

Table 8.10. Evolution of IACM in the Philippines

	IACCC (1991)	**PTFCC (February 2007)**	**Amended PTFCC (August 2007)**
Driving forces	Growing international debate and national interest on the issue of environment and development.	Release of Fourth IPCC Assessment Report; increased domestic concern and call from civil society members to address climate change.	Call for greater mitigation strategies in the country's climate change initiatives.
Legal basis for creation	Presidential Administrative Order 220 (8 May 1991).	Presidential Administrative Order 171 (20 February 2007).	Presidential Administrative Order 171-A (15 August 2007).
EL	DENR.	Office of the President.	Office of the President.
LAs	DENR, DOST.	DENR.	DOE.
OPAs	DFA, DOE, NEDA, DPWH, DOTC, PNCC Senate.	DOE, DOST, DILG, DA, two representatives from civil society, and member-agencies of the IACCC as the technical arm of the new PTFCC; an Advisory Council was created co-chaired by the Presidential Adviser on Land Reform with most members from academia.	DENR, DOST, DILG, DA, DepEd, CHED, two representatives from civil society and IACCC member-agencies.
Mandates/ functions	Coordinate climate change-related activities, propose climate change policies, and prepare the Philippine positions to the UNFCCC.	Conduct rapid assessments on climate change impacts; ensure strict compliance to air emission standards; combat deforestation; reduce GHG emissions; conduct comprehensive public information campaign.	Same mandate as the original PTFCC.
Frequency of meetings	Quarterly per annum (Inter-ministerial).	First met in June 2007.	Four meetings before COP13 (Bali, Indonesia).
Salient features	Civil society participation through the PNCC.	Multi-stakeholder participation; added DA, DILG as members; increased involvement of academia through the creation of an Advisory Council.	Transfer of chairmanship from DENR to DOE; added DepEd and CHED as members; multi-stakeholder participation with more involvement of academia.

Note: EL=executive leadership, LA=leading agency, OPA=other participating agency, IACCC=Inter-Agency Committee on Climate Change, PTFCC=Presidential Task Force on Climate Change, DENR=Department of Environment and Natural Resources, DFA=Department of Foreign Affairs, NEDA=National Economic and Development Authority, DPWH=Department of Public Works and Highways, DOTC=Department of Transportation and Communication, PNCC=Philippine Network on Climate Change (civil society organisations), DA=Department of Agriculture, DILG=Department of Interior and Local Government, DA=Department of Agriculture, DepEd=Department of Education, CHED=Commission on Higher Education and Development.

The mandate of the PTFCC includes (i) conducting rapid assessment on the impact of climate change, especially on the most vulnerable sectors; (ii) ensuring strict compliance to air emission standards and combating deforestation and environmental degradation; (iii) undertaking strategic approaches to reduce GHG emissions; (iv) conducting comprehensive public information campaigns on climate change; (v) designing risk reduction and mitigation measures and adaptation responses to climate change; (vi) collaborating with international partners; (vii) integrating and mainstreaming climate risk management in policies, plans and programmes; and (viii) guiding, coordinating and monitoring implementation of a Climate Change Action Plan.

The most notable structural change from the IACCC to the PTFCC was the addition of the Department of Interior and Local Government as a member. Under the 1991 Local Government Code, the role of Local Government Units (LGU) changed with the devolution of five basic services to LGUs, including environmental protection. LGUs are also encouraged to promote local autonomy by facilitating civil society participation.

Six months after creation of the PTFCC, the structure was altered to designate the Secretary, Department of Energy (DOE) as Chair, and the Secretary, DENR as Vice-Chair. Membership of the PTFCC was expanded to include the Department of Education and the Commission on Higher Education and Development. Unlike the IACCC, the PTFCC meets at ministerial level. Two representatives from the Philippine Network on Climate Change, an NGO coalition, have also attended the PTFCC meetings. Four flagship programmes proposed include (i) mitigation; (ii) adaptation; (iii) financing; and (iv) technology and R&D. Funding is intended to be secured by tapping development assistance funds, among others (PTFCC Philippines 2007).

3.5.2. Stakeholder participation

One of the first steps by the Government in the early 1990s was the formulation of the Philippine Strategy for Sustainable Development and Philippine Agenda 21, documenting the partnership of government with NGOs to implement commitments arising from the 1992 Earth Summit. Hence, the IACCC was created with strong civil society representation. For the First NC, academia and grassroots/community organisations provided support in data collection, capacity building, education and training (table 8.11). Passage of the Local Government Code of 1991 assisted in the decentralisation of sustainable development issues through the formation of Local Councils for Sustainable Development (LCSD) set up in each administrative region.

Table 8.11. Actors in selected activities related to climate change in the Philippines

Activities	Actors and their roles
Section of national delegation at COPs	Majority from national government but NGOs are represented in all COP meetings.
Preparation of national communications (NC)	DENR as lead but LGUs assisted and NGOs and academia have participated through representation at LCSDs.
Promotion of CDM projects	DENR as DNA but LGUs lend support; private sector and NGOs are active through the CDM Steering Committee.
Other domestic voluntary actions related to climate change	With the DENR, DOE and DOST taking the lead in implementation; the passage of laws and regulations (addressing mitigation and adaptation strategies) would not have been possible without the advocacy of civil society groups; private sector has collaborated with government in energy efficiency promotion; academia has lobbied for inclusion of environmental education in the school curriculum.

Note: NGO=nongovernmental organisation, DENR=Department of Environment and Natural Resources, LGU=Local Government Unit, DNA=designated national authority, DOE=Department of Energy, DOST=Department of Science and Technology.

The LCSDs have been created to further strengthen the Philippine Council for Sustainable Development, headed by the Director-General of NEDA as Chair, and the Secretary of the DENR as Vice-chair. The Council consists of various departments of the national government and groups from civil society. Created in September 1992, the PCSD is mandated to (i) review and ensure the implementation of Philippine commitments to sustainable development principles made at the 1992 Rio Summit; (ii) establish guidelines and mechanisms to concretise and operationalise the sustainable development principles; (iii) provide directions in the form of policy reforms, programmes, and new legislations to address emerging issues related to environment and sustainable development; (iv) act as a coordinating mechanism, together with the Department of Foreign Affairs; and (v) adopt a Philippine Agenda 21 and national sustainability plans (PCSD Philippines 2007).

Various mitigation and adaptation measures are reflected in sectoral plans, particularly in energy, transport, and agriculture. The Medium Term Philippine Development Plan for 2004-2010 identified priority interventions in five clusters, including energy. The Philippine Energy Plan (2005-2014) emphasises (i) energy independence and savings; and (ii) power sector reforms.

Related legislation includes (i) Philippine Clean Air Act of 1999; (ii) Philippine Ecological Solid Waste Management Act of 2000; (iii) Agricultural and Fisheries Modernisation Act of 1997 (includes monitoring the effects of global climate change and weather disturbances); (iv) Clean Water Act of 2004; and (v) Electric Power Industry Reform Act of 2001 (calling for greater private sector participation and competition to expedite electrification).

4. Comparative study

4.1. National delegations at COPs

Japan has the largest number of delegates at COPs, followed by the ROK and China, with India and the Philippines having smaller delegations (table 8.12). A larger national delegation may indicate a stronger national potential for international negotiations. Direct representation from the executive leadership (EL) in the national delegation from the ROK, China and the Philippines has been observed in a number of COPs and may indicate the keen interest of the EL on specific matters in the agenda of concerned COPs.

Table 8.12. National delegations at COPs

Actors	Japan	The ROK	China	India	The Philippines
EL	X	4%	0.4%	X	2%
LAs	EA (26%) BRA (14%) FA (14%)	EA (16%) BRA (8%) FA (8%)	- BRA (22%) FA (20%)	EA (47%) - FA (3%)	EA (23%) - FA (3%)
OPAs	17%	7%	27%	11%	31%
Local government	X	X	X	3%	X
Private sector	X	X	X	X	X
Civil society	X	X	X	5%	17%
Academia	4%	18%	22%	3%	2%
Diplomatic missions	21%	13%	9%	34%	18%
Average number of delegates	73	32	27	17	13

Note: Percentage represents the average for each actor from COP1 to COP12.
EL=executive leadership, LA=leading agency, OPA=other participating agency, EA=environment agency, BRA=business-related agency, FA= foreign affairs agency, (-)=not defined as a lead agency, X=no participation.

As a leading agency (LA), the environment agency (EA) plays the major role in the national delegation at COPs for all selected countries except for China. The national macroeconomic agency in charge of energy and industry has the most important role for China. Business-related agencies (BRA), such as industry/energy agencies share roles with the EA in the national delegation for Japan and the ROK, but a limited role for India and the Philippines. This indicates that Japan, the ROK and China have emphasised the economic aspects of climate change. The Ministry of Foreign Affairs plays a significant role in coordinating strategies and negotiating positions in all five countries. In the case of India, delegates from diplomatic missions represent a large share of its national delegation. For the participation of other government agencies related to mitigation, adaptation, science, and finance, significant numbers can be observed for Japan, China and the Philippines.

Generally, there is no representation from local governments in the national delegation at COPs, except for India, especially at COP8, held in Delhi. No country has sent representatives from the private sector in its national delegation. Academia, however, has played an important role for China and the ROK, especially government-affiliated institutes providing scientific support, but a relatively minor role in direct representation at COPs in the cases of Japan and the Philippines. India's government-affiliated research institutes have participated consistently in the COPs.

The conference agenda often influences the size of national delegations. For example, the size of the Japanese delegation showed an increasing trend until COP7, and decreased thereafter. This may indicate that international negotiations have become less important to Japan once the binding targets and flexible mechanisms were clearly defined. The ROK and China show a continuing upward trend. This may indicate the importance of the ongoing negotiations regarding the post-2012 climate regime for both countries. The Philippines and India, on the other hand, have maintained a consistent number of delegates in COP meetings held so far.

4.2. Mandates of IACMs

Though the time of establishment and further evolution differ, IACMs in the selected countries have developed a similar structure with three layers: the EL, typically the Prime Minister's Office for overall coordination; LAs, playing major roles in domestic decision-making and implementation related to climate change; and OPAs of secondary importance.

The mandates of each IACM vary in terms of three broad functions related to (i) negotiations (e.g. preparation of national positions and strategy); (ii) climate policy making (e.g. development of national climate strategy and action plans); and (iii) domestic implementation (e.g. fulfilment of international commitments and implementation of NAPs on climate change) (table 8.13).

Table 8.13. Stated mandates of current IACMs

Mandates	Japan	The ROK	China	India	The Philippines
Negotiations-related function	-	✓	✓	-	-
Policy-making related function	✓	✓	✓	✓	✓
Implementation-related function	✓ (M)	✓ (M&A)	✓ (M&A)	✓	✓ (M&A)
Others	-	-	To integrate CC into national SD	To mainstream CC in national development	To promote public outreach

Note: (✓)=with stated mandate, (-)=without stated mandate, M=mitigation; A=adaptation, CC=climate change, SD=sustainable development.

For negotiations-related functions, although Japan has emphasised domestic implementation of the KP, the Government, through political leadership of the Prime Minister, is now engaged with its strategy regarding the post-2012 climate regime. For the ROK, negotiation has been one of the major functions of its IACM, which has a task force on negotiation. Under international pressure, the Government of China has taken negotiations seriously and negotiation-related activities were specified as a mandate of the IACM. The IACM in China usually meets twice a year, just before and after each COP, showing its concern on international negotiations. In the case of the Philippines, preparation of the country's position for UNFCCC meetings was among the mandates

explicitly provided to the former IACM, the IACCC. Under the new set-up however, while no such direct provision was provided among the IACM's mandates, the law which serves as the basis for its creation stated that its function includes collaboration with international partners at the regional, international and multilateral levels to support climate change efforts at the global level. Negotiation is clearly becoming more important to India with the recent creation of a permanent negotiating team during the March 2008 meeting of its IACM (The Indian Express 2008). However, information on how India coordinated its national strategy in the past is unclear, as the IACM was only created in 2007.

For policy-making functions, IACMs in all countries are mandated to ensure climate concerns are integrated into various sectoral activities. To fulfil these mandates, the development of a national climate strategy and action plan to provide overall guidance is typical. Japan promulgated a law to cope with global warming (1998) and developed a NAP to achieve the KP target (2005). The IACM in the ROK developed three comprehensive NAPs (1999-2007). China published its National Climate Change Programme in 2007. India and the Philippines still lack a comprehensive NAP although the Prime Minister of India announced that its NAP will be ready by June 2008. For national strategies on mitigation and adaptation, Japan has put greater emphasis on mitigation. The ROK has two task forces on mitigation and adaptation, led by the industry agency and environment agency, respectively, under its current IACM. China maintains a strong position on balancing mitigation and adaptation in the climate regime negotiations and provided specific policies and measures for both mitigation and adaptation, two key policy areas in its National Climate Change Programme. India established an IACM in June 2007 and its national strategy addressing climate change is not yet available. The Philippines included both mitigation and adaptation, *inter alia* reducing GHG emissions and designing risk reduction and adaptation response to climate change, as explicit mandates of its current IACM.

For implementation-related functions, Japan, the ROK and China developed NAPs guiding economy-wide implementation. In Japan all 47 prefectures and most municipalities developed action programmes based on the Law (1998). The private sector (Keidanren) developed a voluntary action programme (1997) with participation of key companies contributing 44% of total emissions. The ROK implemented three NAPs including 211 projects. Target plants and workplaces (1,353 as of 2006) joined a voluntary agreement programme with MOCIE and local governments to reduce CO_2 emissions or to enhance energy efficiency (KEI 2008). China's mandatory targets on energy conservation (20% reduction) and on major pollutants (10% reduction) for 2006-2010 are being implemented through disaggregation into sectoral and local targets and energy conservation agreements with 1,000 energy-intensive companies. India and the Philippines have not developed comprehensive NAPs yet and project-based or sectoral approaches have been adopted.

A promising aspect of IACMs' mandates is to integrate climate change into the national sustainable development agenda, which is explicitly stated by two large developing nations, China and India. However, an enigma is why IACMs have developed along separate lines from the apex national sustainable development councils. Japan established the Council for Sustainable Development as a multi-stakeholder forum to follow up Agenda 21 and achieve domestic sustainable development. However there is no apparent linkage between the Council and national IACM. In the ROK, the IACM is presided over by the Prime Minister while the national sustainable development council

is a standing advisory body to the President. China has not established a national sustainable development council, but has an Administrative Centre for China's Agenda 21 and the NDRC and MOST jointly coordinate other agencies in matters related to sustainable development. The creation and evolution of the national IACM in China is separate from the national institutional arrangement for sustainable development. In the Philippines, both the IACM and the national sustainable development council are under the leadership of the President, but established as two separate institutions. Separate national institutional settings for climate change and sustainable development may be attributable to the fact that this issue has not been effectively addressed in the international arena to date. Different triggers for their creation may also lead to their parallel development. Most IACMs in our case studies were established in response to the UNFCCC and its KP, while national sustainable development councils were established in response to the implementation needs of Agenda 21. How to remove this institutional barrier to re-integrate climate change into national sustainable development needs further investigation.

4.3. Evolution of national IACMs

Comparative analysis of IACM evolution was conducted by examining (i) frequency of structural change; (ii) overall coordination by the EL; (iii) LAs in IACMs; and (iv) number of agencies in the IACM (tables 8.14 and 8.15).

Table 8.14. Changes in structure and function of IACMs

Country	Frequency of change	Overall Coordination		Number of agencies
		Initial stage	Latest stage	
Japan	1	Reactive coordination	More proactive coordination	All agencies
The ROK	3	Weak coordination	Strengthened through OGPC	12
China	3	Performed by NDRC	Performed by the Premier	4 to 27
India	1	Performed by MoEF without an IACM	Prime Minister's office	Now 19
The Philippines	2	Performed by DENR	By the President's office	14 to 18

Note: OGPC=Office for Government Policy Coordination, NDRC=National Development and Reform Commission, DENR=Department of Environment and Natural Resources, MoEF=Ministry of Environment and Forests.

National IACMs have changed more frequently in China, the ROK and the Philippines than in Japan and India, possibly due to three major factors. First, some countries are more responsive to the developments in the international climate regime than others in developing their domestic institutions. For example, the initial IACMs were established in Japan (1989), the ROK (1992), China (1990) and the Philippines (1991) in response to the emergence of the climate issue in the international political agenda during the late 1980s. In addition, Japan (1997), the ROK (1998) and China (1998) made substantial structural changes in IACMs in response to the adoption of the KP in 1997. Since the Protocol laid down the respective obligations of Parties, some countries have re-arranged their institutions to be able to respond to these new commitments and/or

be able to optimise opportunities arising out of the KP. More recently, the ROK, China and the Philippines are all considering strengthening their IACMs, partly in response to mounting international pressure on developing nations to take more substantial action. In June 2007, India created an IACM in response to the fourth IPCC Assessment Report and has since then listed various priority areas, largely on adaptation. Second, institutional changes reflect different needs and approaches of domestic implementation. For example, the ROK strengthened the overall coordination by the OGPC and has recognised the role that local governments can play in the implementation of NAPs by including them in the IACM. To achieve mandatory targets, China strengthened overall coordination by the Premier and included more agencies to enforce sectoral implementation. India established an IACM to develop a NAP. The Philippines replaced the DENR (environment agency) with the DOE (energy agency) as chair in its latest IACM to emphasise mitigation. The third factor may be attributed to a change in government. In the ROK, President Kim Dae Jung strengthened institutions to deal with climate change during his presidency (1998-2002). Premier Wen Jiabao took office in 2003 and has put more emphasis on environmental issues, which has resulted in further strengthening of climate change related institutions in China. Recent changes in the Presidency in the ROK and the elevation of SEPA to ministerial level and the re-arrangement of the National Energy Agency in China may also influence their IACMs and related arrangements.

In all countries, overall coordination by the EL has been strengthened over time, due mainly to a need to deal with climate change more squarely. Japan strengthened coordination substantially when the KP was adopted. However, political leadership provided by the Prime Minister has been usually constrained because major coordination on climate change positions is controlled by two lead agencies, MOE and METI. Recently, the Prime Minister has provided political leadership to guide strategy decisions regarding the post-2012 regime. This is considered to be triggered by the fact that climate change is a major topic to be discussed at the G8 Summit 2008 to be held in Japan. Since the 3rd NAP (2005-2007), the ROK has strengthened the EL in its IACM through the OGPC, a ministerial-level body assisting the Prime Minister in policy coordination. The OGPC has fielded two delegates since COP10 (2004) reflecting this change. China has a very substantial EL headed by the Premier in its latest IACM (2007), which aims at strengthening the implementation of two mandatory targets among others. The representation from the General Office of the State Council in the national delegations at recent COP meetings indicates their growing interest in the negotiations aspect. Overall coordination had been effective even before the latest change, conducted by the NDRC, a powerful macroeconomic agency higher than ministry level. The NDRC, together with other agencies, developed a national CDM policy to impose differentiated taxes on different types of CDM projects. India, until recently, had climate change matters largely administered by the environment agency. Climate change was treated as one of several global environmental issues handled by the environment agency. Indian COP delegations are composed predominantly of MOEF and Ministry of External Affairs officials. In the Philippines, though the EL represented by the Office of the President was included in its latest IACM (2007), currently there is not enough information to show significant improvement in overall coordination. However, the formation of an Advisory Council which is chaired by an Advisor to the President (largely comprised of academicians and scientists) with the new IACM (PTFCCC) indicates an intention to strengthen the EL's presence in the IACM.

For the LAs, the environment agency, business-related agency, foreign affairs agency and science agency are key actors in national climate policy making (table 8.15). At the initial stage of an IACM, environment and science agencies played leading roles in addressing scientific aspects of climate change. At a later stage, both business and environment agencies became LAs coordinating mitigation and adaptation, respectively. This change is attributable to a changing perception from a scientific to an economic concern, as well as the resulting opportunities for both Annex I and non-Annex I parties with the adoption of the KP.

Table 8.15. LAs in national IACMs

Country	Initial stage				Latest stage			
	EA	BRA	FA	SA	EA	BRA	FA	SA
Japan	✓				✓	✓		
The ROK		✓			✓	✓	✓	
China				✓	✓	✓	✓	✓
India	✓				N/A			
The Philippines	✓			✓	✓	✓		

Note: EA=environment agency, BRA=business-related agency including energy sector and/or industry sector, etc., SA=science agency, e.g. science and technology agency and meteorological agency, etc., FA=foreign affairs agency, N/A=not available.

Japan has been represented at COPs mostly by MOE (environment agency) and METI (industry agency), together with MOFA (foreign affairs agency) (table 8.12). In the ROK, MOCIE (industry agency) played the dominant role when the KP was adopted in 1997 because the country already perceived climate change as an economic issue. MOE then started to play a more important role and now both MOE and MOCIE are two key agencies of the IACM in the ROK. The role of MOFAT (foreign affairs agency) is also important having been designated as a LA of the special task force on negotiations under its national IACM. The head of the national delegation at meetings of SBSTA/SBI is also from MOFAT. Compared with other countries, the environment agency in China is under-represented while NDRC (a macroeconomic planning agency) has played the substantial role together with MOFA and MOST (science and technology agency). This may reflect a perception that climate change is more an economic issue for China than an environment one. Another reason is that SEPA was weak in China's bureaucracy and lacked the capacity for coordinating climate change responses, an issue cutting across various sectors. However, the recent elevation of SEPA to the ministerial level and the re-arrangement of the National Energy Agency (supervised by NDRC) in the government restructure in March 2008 may imply a strengthened role for the environment agency and stronger energy policies in its national IACM. Further information is not yet available. MOFA heads the Chinese delegation at COPs and coordinates domestic positions and strategies for international negotiations. The dominant ratios of delegates from NDRC (22%) and MOFA (20%) at COPs indicates that these two agencies play the most important roles in the IACM, sharing certain responsibilities with MOST (on CDM related activities), the meteorological agency (on IPCC related activities) and the environment agency. India lacked an IACM before 2007 and the environment agency has played a major role in climate change related activities. For the Philippines, the environment agency has played a dominant role since the initial stage of the IACM (1991) until 2007 when the energy agency became the lead agency. For DNAs in the four selected non-Annex I countries, the industry agency plays the dominant role in the ROK and China while the environment agency plays the leading role in India and the Philippines.

Increased involvement of other agencies is a common feature of the latest national IACM in all five countries (table 8.14). Major agencies include (i) mitigation-related sectors, e.g. construction, transportation, electricity supply and forestry; (ii) adaptation-related sectors, e.g. agriculture, water resources and maritime affairs; and (iii) others such as finance and public affairs. Japan included all agencies and the ROK and China involved most relevant agencies, indicating their more comprehensive approaches for implementation and perception on climate change as a cross-cutting issue requiring cooperative action by all sectors. Involvement of other agencies was not apparent in India, mainly due to the absence of an IACM before 2007. In the Philippines, the number of member agencies in the latest IACM increased with the inclusion of agriculture, education, and local government agencies.

4.4. Stakeholder participation

Local governments and the private sector tend to begin to play more active roles after the country shifts its emphasis from international negotiations to domestic actions, such as implementation of CDM projects and mitigation-related activities (table 8.16). In Japan, all prefectures developed a climate change action programme as required by a national law. The ROK will include the Conference of Local Governments in its latest IACM (2008) to allow local governments to participate in the decision-making process. In China, provincial governments developed action plans and a few of them established institutions similar in structure to the national IACM to undertake activities that will help achieve national mandatory targets, which are now being implemented. Twenty-two provinces also established a CDM promotion centre. In India, several pioneer states have established CDM promotion cells.

Table 8.16. Comparison of stakeholder participation in five countries

Activities	Local governments					Private sector					Civil society					Academia				
	J	K	C	I	P	J	K	C	I	P	J	K	C	I	P	J	K	C	I	P
IACM	-	✓	-	-	-	-	-	-	✓	-	-	-	-	✓	✓	-	✓	-	✓	-
National delegation at COPs	-	-	-	✓	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓
Preparation of national communication	✓	-	✓	✓	✓	✓	✓	✓	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓
Promotion of CDM projects	-	-	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	✓	✓	-	✓	✓	-	-
Other domestic activities*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

* Other domestic activities include domestic implementation of international binding reduction targets for Annex I countries (i.e. Japan), and other domestic voluntary actions addressing climate change by developing countries.
Note: J=Japan, K=The Republic of Korea, C=People's Republic of China, I=India, P=The Philippines, (✓)=involved, (-)= not involved.

In Japan, a voluntary action programme has been adopted by the Keidanren to help achieve national GHG reduction targets. In the ROK, voluntary agreements have been concluded between individual plants and the Government to implement NAPs. In China, national targets are disaggregated into sectoral targets and have been enforced

by signing target responsibility agreements between the NDRC and major enterprises. India has representatives from the private sector in its newly established IACM (2007). In developing countries, particular in India and China, the private sector is very active in developing CDM projects supported by their governments. As of February 2008, India and China hold 33.4% (ranked 1st) and 16.7% (ranked 2nd), respectively, of total projects registered by the CDM-EB. In all countries, with a mix of policy measures in place, such as laws and regulations, economic incentives, financial mechanisms and information disclosure instrument, the private sector is gradually changing production behaviour toward energy and carbon decoupling.

Based on the country's representation at COPs and its involvement in national IACMs, civil society seems to have played a more active role in India and the Philippines than in other countries. Reflecting differences in how governments view civil society, Japan seems to be concerned about the legitimacy of civil society as formal representatives at COPs and in the national IACM, while India and the Philippines have domestic legislation to empower the participation of civil society. In general independent civil society plays a limited role in China compared with other four countries. However, civil society groups working in the environment are more active than in other areas. The ROK is located in between by including representatives from the PCSD, a multi-stakeholder mechanism on sustainable development, in its national delegations. When a country moves to the grassroots implementation stage addressing mitigation and adaptation, civil society can be expected to participate more actively in raising public awareness, educating people to change their behaviour, supporting research and surveys, disseminating information and monitoring the progress towards achieving national targets on climate change.

Academia has played an active role in most domestic activities related to climate change. Government-affiliated or independent institutes have supported R&D, international negotiations, national GHG inventories, scientific information and data, and climate policy making. In the ROK, the inclusion of academics as an expert pool in the IACM from the outset is a distinctive characteristic. In China, government-affiliated research institutes and national universities are included in domestic CDM approval processes. Academics in the ROK (18%) and China (22%) have a high proportion of national representation at COPs, most of whom are from government-affiliated institutes. In India, scientists and experts participate in the IACM in their personal capacity and Indian research institute have been very active members in the conduct of significant region-wide and international climate research activities. In all countries, research institutes provided technical support to develop a GHG inventory for their national communication. Japan, China and India have made significant contributions to IPCC related work. Japan and China had 154 and 43 contributors respectively to the IPCC 4th Assessment Report. Japan, the ROK, China and India have built relatively strong capacity in climate related science and technology, but the Philippines still needs to improve its scientific and research capacity.

5. Conclusions and recommendations

Based on the comparative study across five countries, several tentative conclusions and policy recommendations regarding national institutional development response to climate change in Asia have emerged.

First, there is no “ideal” institutional arrangement that can work well for all countries. Nevertheless, the IACM as a national institutional response to address climate change is clearly more appropriate than fragmentation to combat climate change, a complex issue that cuts across almost all sectors. In response to climate change-related matters at both international and domestic levels, the IACM may prove to be an effective institutional arrangement in coordinating various roles and contributions of involved government agencies to deliver, among others, (i) a consistent national strategy and position for international negotiations; (ii) a coherent and coordinated domestic action plan guiding the fulfilment of international commitments and respective national goals related to climate change; and (iii) effective nation-wide implementation. An IACM may also act as a mechanism to further promote and ensure wider participation of other stakeholders in policy-making processes and implementing climate change-related policies and programmes.

To provide a consistent domestic strategy and position for international negotiations, especially on the post-2012 climate regime under the UNFCCC, an IACM should function to coordinate the perceptions of various agencies and the EL should provide overall coordination and leadership. Once in place, the IACM may create more channels to engage the participation of various interest groups. For example, when implementing mitigation measures, the government would be seen less as a regulator and more as a development partner if it included from the beginning the private sector in the preparation of domestic strategy and determining the position for international negotiations. In this regard, Japan and India provide some good experience by involving representatives from the private sector in their national IACMs. Since a country’s position in international negotiations largely hinges on associated domestic costs and benefits related to international commitments, the IACM will benefit more by working closely with other stakeholders, which can either contribute to reducing these associated costs or optimising the benefits from a given measure. Special committees or forums under the IACM could be optional channels to reflect the voices of various interest groups and integrated assessment could be used as a tool to assist decision-making. In our case studies, the ROK will establish a conference of local governments in its latest IACM (2008). India and the Philippines have representation of civil society at COPs and in their national IACM. In addition, scientific assessment and policy research should be undertaken and applicable for supporting national decision-making and policy-making. Effective participation from academia may be sought by developing, among others, national guidelines for science and technology research related to climate change, providing increased funding for R&D and strengthening networking mechanisms at both domestic and international levels for their continuous contributions to negotiation-related activities. The ROK, China and India, among others, provide some good experience in this respect.

Each IACM should prepare a NAP on climate change, serving as a basic guide for economy-wide implementation of mitigation and adaptation measures. In this regard, a NAP will help each country fulfil its international commitments and their respective national goals related to climate change. Most selected developing countries are trying to make adaptation an integral part of their national strategy addressing climate change. The ROK established task forces on mitigation and adaptation under its latest IACM (2008). China provided explicit policies and measures on both mitigation and adaptation, which are two strands of national policy addressing climate change. India established an IACM in 2007 and since then set various priority areas largely on adaptation. All selected countries include adaptation-related agencies, such as

meteorology, agriculture, forestry, water resources, and maritime affairs, among others, in their national IACM. For mitigation, quantitative national targets should be defined with concrete measures to ensure their achievement. Each country is faced with unique economic, political and social conditions and differing circumstances in responding to climate change, such as resource endowments, energy supply and mix, national GHG inventory, best available technologies, business competitiveness and co-benefits of mitigation as outlined in Chapter two. These differences also influence each country's policy priorities to address the many challenges related to climate change. Japan, the ROK and China, among others in Asia, provide some good experience in this respect.

To ensure effective nation-wide implementation, an IACM should provide horizontal coordination of measures undertaken by different ministries and vertical coordination of local government efforts at various levels. For mitigation, sectoral action plans and local action plans with quantitative targets may be a pragmatic option. Clear linkages between sectoral implementation, local implementation and national targets should be identified by the IACM. To ensure effective implementation of national targets, the overall coordination of the EL in the IACM is important. In the implementation stage, other stakeholders should be brought into full play.

Local governments, as the level of governance closest to human activity, can play a crucial role in educating, mobilising and responding to the public to make grassroots changes in human behaviour. They also help implement national targets by initiating local action plans and projects and oversee their implementation. For local governments, Japan, the ROK and China have developed local action plans. In the ROK's latest IACM, the Conference of Local Governments will be established to provide a channel for their participation. For effective promotion of CDM projects, local promotion bodies established in China and India could be emulated.

The private sector, as a major contributor to both social prosperity and many environmental issues, should live up to their social responsibilities and change their behaviour by adopting energy and resource decoupling production systems (see more in Chapter nine). In our case studies, the voluntary agreement approach for mitigation adopted by enterprises in Japan and the ROK provides a good model. In China, a levy system has been set up to stimulate the private sector to develop CDM projects for priority areas defined by the IACM.

Civil society has played a vital role in the promotion of participatory democracy, especially since the Rio Summit. NGOs can act as a lobby or pressure group to influence the national political agenda on climate change, initiate campaigns to raise the public consciousness on climate change and educate people towards responsible and climate-friendly consumption, aid vulnerable groups who are victims of natural disasters due to extreme climate events, dissemination and disclosure of information on national policy and business behaviour, and assist in monitoring policy implementation, among others. From the country cases, India and the Philippines provide useful experience such as NGO representation in national IACMs and in national delegations at COPs.

Academia can provide the scientific data and information and science and technology know-how that policymakers need in domestic policymaking. The ROK and China have established specific coordination mechanisms between the IACM and academia, especially government-affiliated institutes. These include the participation of

government-affiliated institutes in national delegations at COPs, as an expert consulting body to the IACM, and allocation of budget for R&D on climate change, among others.

Second, countries considering an IACM as a national institutional arrangement to address climate change can consider the hierarchical model, tiered into EL, LAs and OPAs with their distinct mandates and modes of cooperation, as a practical option. To ensure efficient and effective overall coordination, the Prime Minister/President (or representatives on their behalf) should provide strong leadership to coordinate competing or conflicting interests among ministries related to climate change and coordinate local governments and other stakeholders. To integrate mitigation and adaptation in the national action plan on climate change and to ensure its implementation, the industry/energy agency (for mitigation) and the environment agency (for adaptation) should be empowered as LAs among other ministries according to domestic circumstances, *inter alia* bureaucratic arrangements and policy priorities addressing climate change. Sectors other than industry/energy contributing substantially to national GHG emissions (e.g. agriculture, transportation and construction, etc.) or related to adaptation (e.g. meteorology, agriculture, forestry, water resources, maritime affairs, public health and public affairs, etc.) should be included as OPAs.

Third, although most IACMs were established as an institutional mechanism in response to climate change at both international and domestic levels, it is timely for all countries to shift their national emphasis from international negotiations to domestic actions addressing mitigation and adaptation. It is also important for all countries to move forward from climate change as a stand alone national agenda to being part of the ongoing national sustainable development effort. How to make this change should be further studied. At the implementation stage under the UNFCCC, an effective institutional arrangement should feature (i) strong overall coordination by the EL; (ii) empowerment of the industry/energy and environment agencies as joint LAs coordinating mitigation and adaptation; (iii) involvement of all major sectoral agencies related to mitigation and adaptation; and (iv) maximisation of the use of the comparative advantages of other stakeholders as mentioned above.

Fourth, the four factors listed above for improving domestic institutional capacity related to climate change need to be tailored to domestic circumstances. For the selected countries, due to different domestic circumstances and international commitments, Japan, the ROK and China possibly have more advanced institutional capacity than India and the Philippines. If each country needs to make more substantial efforts to address climate change in the future, there seems to be room for the improvement in domestic institutional arrangements (table 8.17).

Table 8.17. Status of current domestic institutional arrangements

Success factors	Japan	The ROK	China	India	The Philippines
Law on climate change	✓	X	X	X	X
NAP addressing both mitigation and adaptation	✓ (M)	✓ (M&A)	✓ (M&A)	X	X
Overall coordination by the EL	Medium	Stronger	Stronger	Weaker	Weaker
BRA and EA as joint leading agencies coordinating mitigation and adaptation	✓	✓	✓	✓	✓
Involvement of relevant sector agencies as OPAs	✓	✓	✓	✓	✓
Well established mechanisms to empower stakeholder participation	LG, PS, AC	LG, PS, AC	LG, PS, AC	PS, CS, AC	LG, PS, CS
Integrate climate change into national sustainable development	X	X	X	X	X

Note: NAP=national action plan, EL=executive leadership, BRA=business-related agency, EA=environment agency, OPA=other participating agencies, LG=local governments, PS=private sector, CS=civil society, AC=academia, (✓)=present, (x)=absent.

This comparative study indicates, for example, that the following measures can be considered to improve the performance of national IACMs in five countries:

(i) The overall coordination of the EL could be strengthened for Japan to ensure effective implementation and the integration of mitigation and adaptation in Japan's national action plan and local action programmes needs to be addressed.
(ii) Empowerment of the environment agency to play a more important role in the national IACM and strengthening the implementation of national action plan could be considered for China.
(iii) More effective mechanisms to mobilise participation of civil society could be established in Japan, the ROK and China.
(iv) NAPs could be considered for India and the Philippines to provide overall guidance to domestic implementation.
(v) Capacity for scientific research could be increased for the Philippines.
(vi) Integration of climate change into national sustainable development planning and implementation could be promoted for all countries.

Future research agenda - In this study, an analytical framework was used to examine national institutional arrangements addressing climate change for a comparative study of five Asian countries. In the future, a study on institutional development on climate change in Asia may be extended to include other countries, especially those with peculiar national conditions, such as small island developing states, least developed countries and oil exporting countries. Future research may also delve into more in-depth study of the five countries originally chosen; for example, the effectiveness of each IACM and policies related to climate change at the national, sectoral and local levels.

The enigma of why climate change has been treated as a stand alone development issue rather than being integrated into existing national sustainable development

structures, measures and implementation plans requires further research. Separate climate change action plans that conflict with national sustainable development plans are clearly undesirable but possible if institutional arrangements remain apart.

The final goal of effective institutions is to achieve grassroots behavioural change. Unless the relations between specific institutional arrangements and associated behavioural changes are understood, the effectiveness of institutions can not be assessed. Although some success factors for establishing an ideal institutional arrangement were identified, this does not help to assess the effectiveness of real world institutional arrangements in achieving tangible climate change outcomes. This remains a challenge for future research.

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Endnotes – Chapter 8

[1] The ROK's case study was based on secondary information provided by the Climate Change Research Division of the Korea Environment Institute according to a structured questionnaire.