

Scientific Approach to Low-Carbon Development Planning in Cambodia

Stakeholders' Dialogue on the Cambodian Low-Carbon
Development and Research Need

Synthesis Report
-Key findings from the dialogue-



10 January 2011
Phnom Penh, Cambodia



Key Messages

- **There is the growing understanding of the Cambodian government about the need for LC development that is consistent with national sustainable development priorities.**

- **Further consideration on;**
 - BAU to be a basis in defining possible options for low carbon future of Cambodia: ex. Energy structure
 - Developing low carbon policy blueprints should be the basis for sub-national, and sectoral level climate policies.

- **Policy-makers tend to be more interested in interventions that bring tangible and immediate benefits. Science based analysis of long-term policies is a prerequisite to ensure sustainable low carbon development.**

- **Policy makers strongly need credible, integrated, relevant research findings by researchers to support policy design.**

- **Coordination of existing research and further development of research agenda in a strategic way in collaboration with policy-makers and researchers are important.**

- **Land use policy planning and policy coordination at the national and sub-national levels is important for the efficient use of resources.**

- **Research for the localisation of technology is important for successful implementation of low carbon policies.**

- **As the current decision will shape long-term future course of development, what is shown in LCS scenario is important.**

- **Drawing a scenario reflecting development plans based on the data extended from the national GHG inventories may be a good approach for Cambodia.**

Acknowledgement

This Synthesis Report draws together findings from the Stakeholders' Dialogue on the Cambodian Low Carbon Development and Research Need. The dialogue took place as a meeting, entitled *Scientific Approach to Low-Carbon Development Planning in Cambodia*, on 10 January 2011, co-hosted by Ministry of Environment, Cambodia and Institute for Global Environmental Strategies (IGES) / Secretariat of the International Research Network for Low Carbon Societies (LCS-RNet Secretariat), at Sunway Hotel, Phnom Penh, Cambodia.

The objective of the meeting is to seek the possibility of collaboration between Cambodia and Japanese research institute in drawing low carbon development plan of Cambodia. This is a dialogue between policy makers and researchers to share up-date information and realise the need of LCS researches in Cambodia, in collaboration with Asia-Pacific Integrated Model (AIM) scenario/modelling team.

The issues covered in this report are the following, which would be of great interest to policy-makers and researchers in making the transition toward Sustainable Low-Carbon Development;

- How Low-Carbon research has been applied in Asian low carbon development
- Existing science-based experience in Cambodia
- Green Growth Roadmap of Cambodia
- What kind of research are necessary to support sustainable low carbon policy-making in Cambodia

I would like to take this opportunity to express our profound gratitude to all speakers and participants from the government of Cambodia and academia for their contribution to the meeting. I would also like to add our sincere appreciation to Dr. Tin Ponlok, Deputy Director General, Ministry of Environment, Cambodia and Climate Change Department, Ministry of Environment, Cambodia for their guidance and support to materialise this dialogue. Special gratitude goes to Mr. Thy Sum and Mr. Hak Mao, Ministry of Environment, Cambodia for their guidance in planning this dialogue, since they made a considerable effort to coordinate this meeting.



Shuzo Nishioka
Secretary General / LCS-RNet Secretariat

Preface

Cambodia is one of the Asia and Pacific countries that has gained rapid economic growth thanks to the Royal Government of Cambodia's efforts to implement the Rectangular strategy to support sustainable development and poverty reduction. Cambodia like the global community, is becoming increasingly aware that climate change is caused by intensive human industrial activities and unsustainable economic development. It impacts not only our present generation but also the people in future generations who will need to adapt to and mitigate the effects of a volatile climate change.

Having understood the consequences of such impacts, the workshop on **Scientific Approaches towards Low Carbon Development in Cambodia: Concept, Methodology and Tools for Planning Low Carbon Development** was held on 10 January 2011, Phnom Penh, Cambodia, co-organized by the Cambodia's Ministry of Environment and Institute for Global Environmental Strategies (IGES) as International Low Carbon Society Research Network (LCS-RNet) Secretariat, in cooperation with National Institute for Environmental Studies (NIES), Japan, and Kyoto University with the objectives to identify the existing research capacities as well as their future potentials for LCD strategies, and LCS research demands of policy makers in Cambodia to support policy-making process; scope future LCS research (e.g. using appropriate LCS scenario/modeling methodology) in Cambodia; and develop LCS capacity-building/networking needs of Cambodian researchers with neighbouring countries in Asia.

Low-Carbon Society will serve as a guiding principle to turn the challenges of today into opportunities so that our countries can make headway towards sustainable development. The development of a Low-Carbon Society will significantly contribute to the achievement of the Cambodia Millennium Development Goals (CMDGs), the Rectangular Strategy (RS) and the National Strategic Development Plan (NSDP) update 2009-2013 as set by the Government.

This synthesis report summarises key findings from the dialogue, which covered diverse issues such as interdisciplinary approach toward low-carbon development, collaboration between policy- and research communities, focused areas (e.g. forestry, land-use change and energy sector), role of technology, financing schemes and lifestyle innovation. The key messages in this report identify the important issues to be focused on and help scientists to develop future research agenda and policy-makers to enable policy-making based on scientific evidence where possible. The issues covered in this report are of great interest to policy-makers and researchers in making the transition toward Sustainable Low-Carbon Development.

We would like to take this opportunity to convey our sincere gratitude to **Samdech Akka Moha Sena Padei Techo Hun Sen**, the Prime Minister of the Kingdom of Cambodia who always provides committed leadership and policy guidance to ensure prosperous national growth which integrates environment sustainability into the national development agenda to conserve the environment, reduce poverty and increase green job opportunities, and his holistic envisagement on the environment and support for the development of Sustainable Low-Carbon in Cambodia. We would also like to express our gratitude to the responsible senior management and Climate Change Department Officers of the Ministry of Environment, Cambodia and IGES/NIES staff for their considerable efforts, facilitation and contribution in planning and preparation of the workshop. We would also pay our gratitude to speakers and participants for active participation and discussion during the workshop. We will further continue our joint efforts towards a significant forum for collaboration toward Sustainable Low-Carbon Development between Cambodia, Japan and other Asian countries.

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Synthesis Reports

1. There is the growing understanding of the Cambodian government about the need for LC development that is consistent with national sustainable development priorities.

Cambodia is still in the stage of reconstruction. The construction of the physical and institutional infrastructures that are necessary to support its future social and economic growth is a priority for Cambodia's national developmental policy. Although it is identified as a Least Developed Country (LDC) by the criteria of the CDP: United Nations Committee for Development Policy, Cambodia is showing a steady increase of its economy in these years. However, its economy is still vulnerable to the external pressures as indicated during the global economic downturn since 2008. The high dependency of energy supply on the imported fuels is also seen as a weakness of Cambodia. On the other hand, it is true that, owing to the geographical and political advantage of being situated in Asia, Cambodia's economy has recovered relatively quickly with other neighboring countries. This is evidenced by the IMF forecast of the Cambodian GDP growth rate of 6.75% in 2010 that is much higher than the global average of 3.9%. With this background, the government of Cambodia is recognizing the importance to reflect on the low carbon policies in its development strategies.

Cambodia's development policy is described as the Rectangular Strategy (RS) consists of growth, employment, equity and efficiency (See Figure 1). They already include strategies for low carbon development in the areas of natural resource management, energy sector development, forestry reform, and transportation infrastructure. The RS was developed in 2004 with a clear recognition by the Government of Cambodia of the need for holistic and integrated approach towards sustainable development.

With this background, the National Strategic Development Plan (NSDP) was developed as the single overarching medium-term development plan for the Government and as such functions as the key reference point for the harmonisation and alignment of official development assistance under

the government leadership, as outlined in the Action Plan on Harmonisation and Alignment. The NSDP was developed by the MOP in consultation with other stakeholders including Government Ministries and institutions, external development partners, and civil society. After approval by the Council of Ministers, National Assembly, Senate, and the King, the NSDP was officially launched on 15th of August 2006. Therefore, policies under the NSDP are showing the direction towards sustainable low carbon development for the Cambodian people.

Decentralization and deconcentration (D&D) strategy is a key policy.

The NSDP for 2006-2010 (NSDP 2006-2010) aims to ensure that land and natural resources are used in an efficient manner to support sustainable and equitable socio-economic development for all Cambodian citizens, with its decentralization and deconcentration (D&D) strategy. This is indicative of a future development strategy of positioning Cambodia as an agricultural country with sound rural/agriculture communities supported by low carbon infrastructures.

This policy direction is elaborated in the National Strategic Development Plan Update 2009-2013 (NSDP Update, 2009-2013), which is now under preparation, to provide details on specific actions, programs, and projects to be carried out by ministries and agencies to achieve nationally prioritized goals as stated in the Rectangular Strategy - phase II.

2. Defining possible policy options for low carbon future.

BAU to be a basis for defining possible options for low carbon future of Cambodia: for example Energy structure.

Decentralized energy supply system and transportation are the main target areas for Cambodia's sustainable low carbon development. 80% of population lives in the rural areas, and more than 14 % are in Phnom Penh. To date, Cambodia has achieved access to electricity of 53.6% for households in urban areas, and 8.6% in rural area. RGC's target is to increase this to 100% by providing access to every local community

by 2020. For example, in line with Decentralization and Deconcentration (D&D) strategy, Cambodia is promoting micro-scale electricity supply systems instead of large scale power plants with the nation-wide grid.

Sound rural communities to support agriculture, forestry and fishery sectors.

Agriculture is the largest and most important economic sector of Cambodia at present, and also for the future economic development. For agriculture, as the stable supplier of food and as a sector expected to be a supplier of commodities for exports, together with the forestry and fishery sectors, sound rural communities are the basis of the future of Cambodia. Therefore, development policies for those sectors and communities are highly important.

Cities and their development plans

The urbanization process is not yet fatally problematic in Cambodia as compared with other Asian countries that accommodate mega-cities with various kinds of adverse socio-economic effects associated with urbanization and growing population. Considering this, Cambodia may be said to be in an advantageous position to promote sustainable low carbon development unlike other countries which are already experiencing high carbon-based urbanisation and economic development. To avoid urbanization problems in the future, sound socio-economic development in line with D&D strategy is crucial. Cambodia already has some plans of regional development taking the geographical, economical, and developmental issues into account. One of the examples is Sihanoukville which has the largest port in Cambodia.

The combination of decentralised energy supply system and transportation aiming for carbon free city development could be a key strategy for this purpose.

Drawing BAU is a challenge.

Tremendous effort is necessary for Cambodia to draw appropriate BAUs as the basis of defining possible options for low carbon future in various economic sectors. However, for the successful policy design and their implementation, and achieving substantial result, acceptable level of science-based BAU with the appropriate understanding of the current situation is a prerequisite.

3. Policy-makers tend to be more interested in interventions that bring tangible and immediate benefits. Science based long-term policies is a prerequisite to ensure a sustainable low carbon development.

The gap between the tendency of policy-makers to be interested in short-term benefits and the nature of low carbon policies that require decades to be materialized is the issue that all countries are facing. Although it is a fact that it will take some time to gain benefit from the investment in the LC policies, as the case of Japanese model and scenario studies indicate, the early investment can also reduce cost and enhance energy efficiency of countermeasures and bring multiple benefits (e.g. energy security, business growth, comfortable living spaces, walkable city, happy life, etc.). The RGC is already recognizing that low carbon policies, while imposing certain costs on the economy and the society in the short term, can bring long term benefits for multiple purposes in Cambodia, such as increased energy security by reducing the dependency on imported fossil fuels, a stable economy free from the fluctuation of international fuel prices, accelerated LC technology transfer, and more jobs. However, such benefits must be clearly explained by the scientific communities to all stakeholders including policy-makers, voters and industries in order to make them understand and consider the initial cost as the investment or trade-off for the future.

Multi-level governance and policy-coordination are important.

It is also very true that adaptation is the most pressing need for certain economic sectors and rural areas of Cambodia. For effective adaptation, the local and regional knowledge is a very important input for the policy-making. As the resources and time are limited, long-term mitigation and adaptation policies must be developed in an integrated manner for the timely and efficient use of resources for low carbon development.

For the successful implementation of mitigation policies in the agricultural, forestry and renewable energy sectors, good governance in cooperation with regional and local governments working with local communities, guided by the strong initiative of the central government, is crucial. This is already consistent with the D&D strategy of Cambodia. As such, multi-level approach and cooperation amongst ministries to draw a grand design and set up policies

for those as guiding signals for the nation is important. At the same time, the role of local government authorities who are actually responsible for policy implementation is highly important. Therefore the coordination between central and local governments in the policy-development process and implementation is important.

4. Policy makers strongly need credible, integrated, relevant research findings by researchers to support policy design.

The Sustainable Low Carbon development cannot be attained only with GHG emission reduction with energy policies. It is essentially connected with national development planning, that considers the transition/conversion of development pattern/strategies from conventional highly carbon dependent industrialization to sustainable low carbon development. It is indeed necessary to consider the transition of, not only energy, but economy, environment and a society as a whole that could be attained in the span of several decades.

A major difficulty in developing policies related to the Climate Change is how to deal with large uncertainties that associate with virtually all the factors that needs to be taken into account. Especially, when the resources are limited, it is necessary to understand the degree of uncertainties and how to incorporate them in policy formulation and implementation. It is also important to quantify the impact on society and economy with the understanding of associated uncertainties in order to prioritize target areas and policies for the efficient use of limited resources.

The understanding of uncertainties of various factors and inter-linkages of issues and policies across sectors is necessary. In the example of model studies that are used to develop LCS scenario of Japanese mid- and long-term targets, multiple scenarios – incorporating a range of options and uncertainties – were developed for the consideration by policy-makers. In the same models used for local level scenarios of some Asian cities, many factors were considered in addition to energy policy options, for example GDP growth projections, and technological change and accessibilities, other variables such as population and demographics, impact of globalization, distribution/equity, environmental ethics and values/commitment to sustainability, and institutions and governance.

To understand those issues and how they are related with each other, various scientific studies need to be carried out with the collaboration between policy-makers and researchers.

International cooperation and financing.

The cooperation through various bilateral, multilateral, and international initiatives and institutions must be supported. Cambodia commits to voluntary participation in the international emission trading and carbon market through mechanisms like REDD+, NAMA and other initiatives. The successful participation in such initiatives is dependent on the capacity of Cambodia to draw internationally acceptable BAU scenario as well as the mitigation scenarios with science-based policy analysis. This has been already proved by the experience of Cambodia in its effort of national inventories and its advantageous situation for CDM. As Cambodia already has a good base of inventories in some sectors, further effort is needed to enhance the science-based policy making by establishing good cooperation with scientific communities and cooperative agenda setting with researchers, and establishing the capacity and the institutional arrangement for data collection in major inventory sectors with appropriate international assistance. With such efforts, Cambodia can be placed in a good position to gain access to the international fund.

5. Coordination of existing research and further development of research agenda in a strategic way in collaboration with policy-makers and researchers are important.

In Cambodia, knowledge on LCS is still not clear to many policy-makers and researchers. Therefore, what kind of society is desirable as the Cambodian LCS and how it will bring about the benefit could be an important message to policy-makers to start with.

As explained above, there is a consensus on the importance of the cooperation between policy-making and research communities. The challenge is to realize decoupling of carbon emissions and economic and societal development. This is a huge challenge for Cambodia as there has been no proven successful low carbon policy for LDCs. Indeed, there has been no precedence of successful decoupling between carbon emissions and economic development in the recent

human history. An ideal step to start with is to develop a vision of low carbon sustainable society of the future Cambodia and apply back-casting to consider what is necessary in mid-term along with the forecasting of technology options. However, difficulties in such studies will be amplified with large uncertainties of Climate Change, timing of technology deployment, availability of resources for those deployments, and other factors.

Therefore, sharing information between policy-makers and researchers, and working together to identify research needs for policy-making process is necessary. There are many ideas such as eco-village, waste management, and promotion of alternative transportation, that are already being considered by the RGC. The macro economic studies before the actual implementation of such policies at a large scale would be useful. Urban development and land-use policy studies are also important as Cambodian policy promotes change from forest state to agriculture state.

Policy-makers need to understand how to interpret society/world shown by models and how to design policies for real society that could be done with the help of scientists.

6. Land use policy planning and policy coordination at the national and sub-national levels is important for the efficient use of resources.

At present, nearly 98% of rural households are dependent on fuel woods and other products from the forest for energy. RGC is aiming to replace this with more organized energy supply based on renewables, e.g. use of solar, mini hydropower, and biomass. Together with conversion of energy supply from fossil-based to renewables for the industrial sector and urban areas, increasing demand for the croplands for food and biofuels are anticipated. The creation of hydropower facilities could also cause the conversion of lands. Taking those issues into consideration, a comprehensive policy coordination amongst agriculture, forestry and fisheries, energy and industrial sectors, under the long-term policy scenario for low carbon development plan is desirable to attain well-balanced and sustainable low carbon development.

7. Research for the localisation of technology is important for the successful implementation of low carbon policies.

In expectation of future economic development, it is important for Cambodia to develop policies to enable leap-frog from carbon intensive way to the LC economy.

Cambodia has a target of rural electrification of 70% of households. This will be achieved by enabling all rural areas an access to electricity by 2020. The strategy is characterised as promotion of mini-grid or off-grid rather than being fully dependent on the grid connection. To meet this target, 2 million kW electricity is required.

Some studies and experiments of technologies to promote biofuel, such as the use of jatropha curcas and other crops, are already being carried out by researchers. In view of the sustainability, identification of the best technologies that meet the condition of Cambodia and the ways to develop those technologies domestically is crucial.

8. As the current decision will shape long-term future course of development, what is shown in LCS scenario is important.

The goals and targets for 2010 that are laid out in the NSDP are derived in large part from the Cambodian Millennium Development Goals (CMDGs). It is estimated that US\$ 3,500 million will be needed for the public sector during 2006-2010 to achieve the goals and targets set out in the NSDP. However, the available sources of financing for implementing policies and measures are limited. Cambodia needs studies to enable policymakers to prioritise areas to maximise the efficient use of resources. It is also necessary to consider the inter-linkages between target areas such as energy and land-use policies, adaptation policies in agriculture and the GHG mitigation, for instance improvement of productivity and soil management. There must be a number of options available to consider for the best application to Cambodia. Research is necessary to look into such policy impacts across sectors. Just like drastic change in the past in industries brought about major societal change, models such as AIM help policy makers to consider how current decision in industry and economy will shape the future society in Cambodia.

Ideally, it is desirable for countries and cities to develop their own targets and scenarios to achieve substantive results from policies as each city/country/region has its own specific background and characteristics.

9. Drawing a scenario reflecting development plans based on the data extended from the national GHG inventories may be a good approach for Cambodia.

Cambodia already has experience of science-based approach through the development of GHG inventories for two National Communications to the UNFCCC (2001) and the latest 2nd National Communication which is now under development using LEAP/MARKAL model.

The effort of Cambodia to develop GHG inventories dates back to late 1990's. Due to its historical background, particularly the disconnection of scientific and technical basis from the policy-making processes that led the lost decades for Cambodian people to develop science-based policy-making capacities up to 1990's. However, despite such difficulties, RGC has been making tremendous effort to develop GHG inventories of its main economic sectors and trying hard to develop capacity of science-based policy-making. This is evidenced in the fact that Cambodia is in the better position than other developing countries, particularly the LDCs, as the host country of the CDM projects under the UNFCCC. At the moment four CDM projects have been registered at the CDM Executive Board of the UNFCCC. All of these are related to shifting of energy sources from fossil-base to renewables. Three more projects are in the stage of validation, and seven CDM projects have been approved by the Cambodian DNA.

Data used for estimation needs to be further elaborated for the use of integrated models to draw scenarios. The challenge here is the difficulty to obtain reliable activity data, as there is no uniform format for the methodologies and specifications. The crucial points to overcome this problem could be the clarification of the extent of availability of data, identification of the studies required for data collection, and the cooperation between policy-makers and researchers across sectors, as well as across ministries. Training of personnel is also required for this endeavour.

RECTANGULAR STRATEGY

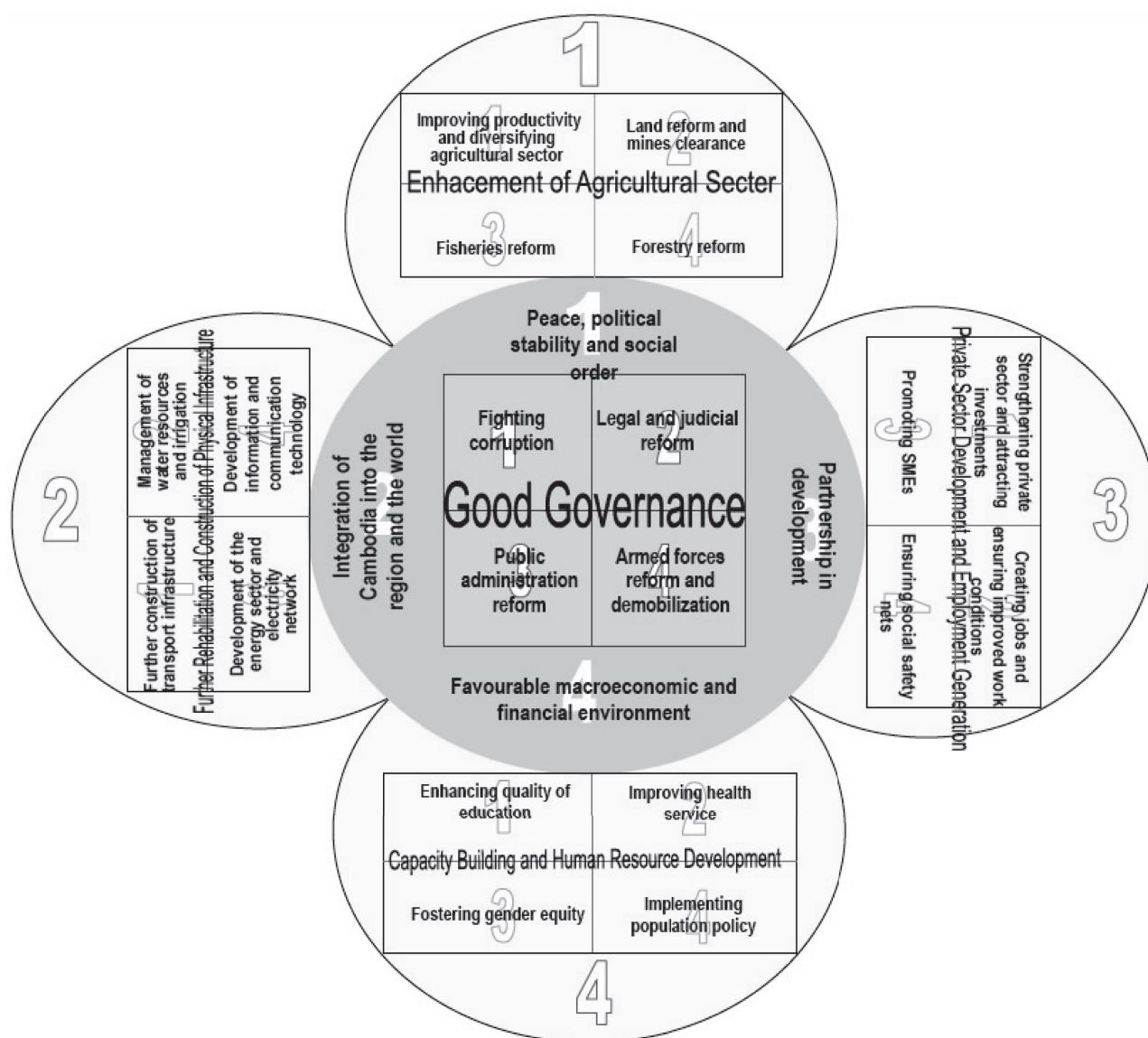


Figure 1 Rectangular Strategy of Cambodia

¹ In its latest triennial review of the list of Least Developed Countries (LDCs) in 2009, the Committee for Development Policy used the following three criteria for the identification of the LDCs:

- A low-income criterion, based on a three-year average estimate of the gross national income (GNI) per capita (under \$905 for inclusion, above \$ 1,086for graduation);
- A human capital status criterion, involving a composite Human Assets Index (HAI) based on indicators of (a) nutrition: percentage of population undernourished; (b) health: mortality rate for children aged five years or under; (c) education: the gross secondary school enrolment ratio; and (d) adult literacy rate; and
- An economic vulnerability criterion, involving a composite Economic Vulnerability Index (EVI) based on indicators of (a) population size; (b) remoteness; (c) merchandise export concentration; (d) share of agriculture, forestry and fisheries in gross domestic product; (e) homelessness owing to natural disasters; (f) instability of agricultural production; and (g) instability of exports of goods and services.

² AIM model: <http://www-iam.nies.go.jp/aim/index.htm>

Agenda

Part 1: Stakeholders' Dialogue on the Cambodian Low Carbon Development and research need

Welcoming remarks

Tin Ponlok, Deputy Director General, Ministry of Environment, Cambodia
Shuzo Nishioka, Secretary General, LCS-RNet Secretariat/IGES

Presentations

Brief introduction of LCS-RNet

Kyoko Miwa, Senior Researcher, LCS-RNet Secretariat/IGES

How Low-Carbon research has been applied in Asian LC Development

Junichi Fujino, National Institute for Environmental Studies, Japan

CAMBODIA: Current Status of GHG Inventory and SNC

Uy Kamaly, Head of GHG Inventory and Mitigation office, Ministry of Environment, Cambodia

Cambodia's Green Growth Roadmap

Hak Mao, Climate Change Department, Ministry of Environment, Cambodia

CDM project development in Cambodia

Thy Sum, Director of Climate Change Department, Ministry of Environment, Cambodia

The Current Status of Renewable Energy, Energy Efficiency Development in Cambodia

Toch Sovanna, Director of Energy Technique, Ministry of Industry, Mines and Energy

Dialogue among stakeholders

Research demands of policy makers

Part 2: Workshop: Scientific Approaches towards Low Carbon Development in Cambodia: Concept, methodology and tools for planning low carbon development

Presentations

Low Carbon Development in Asia

Mikiko Kainuma, National Institute for Environmental Studies, Japan

Low-Carbon Society Modeling and Scenario Making Process

Yuzuru Matsuoka, Kyoto University, Japan

Research Proposal on Low Carbon Society Development in Cambodia

Hak Mao, Climate Change Department, Ministry of Environment, Cambodia

Research Activities at the Department of Environmental Science, Royal university of Phnom Penh, Cambodia

Kok Sothea, Royal University of Phnom Penh

Use of biofuel and biomass for rural electrification and green house gas reduction

Rey Sopheak, Institute of Technology of Cambodia, Cambodia

Discussion

Discussion

Wrap-up

Kyoko Miwa, Senior Researcher, LCS-RNet Secretariat/IGES

Closing Remark

Tin Ponlok, Deputy Director General, Ministry of Environment, Cambodia

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