



KINGDOM OF CAMBODIA

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THE NATIONAL GREEN GROWTH ROAD MAP

March 2010

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ACKNOWLEDGEMENT

The National Green Growth Roadmap is an important tool to contribute to sustainable implementation of the national sustainable development strategy and policy in the Kingdom of Cambodia.

The roadmap development was processed through meetings of the inter-ministerial Green Growth Working Group (IGGWG) to analyze and identify country's needs, issues, pressures, status, the legal and policy framework and the opportunity for joint implementation of green growth policy through short term, medium term and long term interventions in seeking solutions to environmental concerns and aiming for long term environmentally sustainable economic development and human well-being.

On behalf of the coordinator for preparing the National Green Growth Roadmap, I would like to express my deep gratitude to **Samdech Akeak Moha Sena Padey Decho Hun Sen, Prime Minister** of the Royal Government of Cambodia who always provides greatest leadership and policy advice to ensure the national prosperous development by mainstreaming environmental concerns into national development agenda to conserve the environment in order to reduce poverty and increase job opportunities to the people, enhance livelihood options and ensure equitable access to resources.

My profound thanks go to HE Dr Mok Mareth, Senior Minister and Minister of Environment, for his strong support and wise supervision over all the development process of the National Green Growth Roadmap.

I would like to take this opportunity to extend my special gratitude to H. E. Mr. Khong Sam Nuon, Secretary of State, Ministry of Environment and the Chair of Inter-ministerial Green Growth Working Group (IGGWG) for his strong support and effective facilitation of the development of this Green Growth Roadmap. I would also like to sincerely thank Ms. Aneta Nikolova, Environmental Affairs Officer and Mr. Simon Hoiberg Olsen, Associate Environmental Affairs Officer from the Environment and Development Division of the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and Mr. Hak Mao, the national consultant, and the Regional Helpdesk on Sustainable Consumption and Production for Asia and the Pacific for providing technical advice, assistance, and substantial input to develop this Roadmap as a strategy and work programme for the formulation of national policy and action for environmentally sustainable economic growth and low-carbon development in Cambodia.

I wish to sincerely thank the Government of the Republic of Korea for providing financial support through Korean International Cooperation Agency (KOICA) for developing this Roadmap. My Special thanks are also extended to other contributors including all stakeholders and line Ministries for their invaluable assistance in preparing this Roadmap. Moreover, my deep thanks are also extended to the Inter-ministerial Green Growth Working Group for their kind cooperation and contribution to produce this Green Growth Roadmap.

Phnom Penh, 25th March 2010

Deputy Director General of Technical Affairs,
Ministry of Environment
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Koch Savath

PREFACE

Recent decades of accelerated socio-economic development in Asia and the Pacific has put additional pressure on natural resources and environment while climate change has become the main challenge requiring all governments in the world to take stocks and seek joint solutions for ensuring sustainable development.

In response, the 5th Ministerial Conference on Environment and Development held in March 2005 in Seoul, Republic of Korea, has adopted the green growth concept aimed to improve people's wellbeing worldwide.



Through the effort made by the Ministry of Environment and the good collaboration with national and international green growth partner agencies, I have a great pleasure to present the newly developed national green growth roadmap, an outcome of the good collaboration by government agencies at all level with NGOs, private sector and green growth partner projects and programmes, that was adopted by the Inter-ministerial Green Growth meeting held on the 08th February 2010 in Siem Reap.

The green growth roadmap is envisaged to ensure Cambodian people's prosperous and sustainable livelihood, taking into account the environmental quality and people's well-being objectives of a low carbon economic growth and development and also access of our future generations to the same for their prosperous lives.

In light of this, the National Green Growth Roadmap proposes to create win-win situations among economic, environmental and social development to show that environmentally sustainable economic development and human well-being can be achieved through short, medium, and long-term green growth interventions as suggested in the roadmap.

I would like to take this opportunity to also highly value and appreciate the inputs by the Inter-ministerial Green Growth Working Group (IGGWG) and all technical advisors for successful development of the national green growth roadmap.

I would like to express my profound thanks to the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and the Korean Government for the financial and technical support through Korean International Cooperation Agency for the development of the roadmap that would benefit Cambodian and the world.

Finally I would like to reassert my commitment to implement the national green growth successfully.

Phnom Penh, date 25 Mach2010
Senior Minister
Minister of Environment

A handwritten signature in black ink, appearing to read 'Mok Mareth'.

Dr. Mok Mareth,

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ABBREVIATIONS

ADB	Asian Development Bank
AIDs	Acquired Immune Deficiency Syndrome
A/R-CDM	Afforestation and Reforestation for Clean Development Mechanism
CCoC	Cambodia's Chamber of Commerce
DANIDA	Danish International Development Agency
D & D	Decentralization and Deconcentration
DPs	Development Partners
EDP	Economic Development Plan
ESTs	Environmental Sound Technologies
GDP	Gross Domestic Product
GMS	Greater Mekong Sub-region
GMOs	Genetically Modified Organisms
GTBR	Green Tax and Budget Reform
HSP	Health Strategy Plan
IOs	International Organizations
ISA	Integrated Sustainability Assessment
KOICA	Korea International Cooperation Agency
MATISSE	Methods and Tools for Integrated Sustainability Assessment
MAFF	Ministry of Agriculture, Forestry and Fisheries
MIME	Ministry of Industry, Mines and Energy
MLMUPC	Ministry of Land Management, Urban Planning and Construction
MoI	Ministry of Interior
MLVT	Ministry of Labor and Vocational Training
MoT	Ministry of Tourism
MWA	Ministry of Women's Affairs
MoC	Ministry of Commerce
MoE	Ministry of Environment

MEF	Ministry of Economy and Finance
MoP	Ministry of Planning
MoEYS	Ministry of Education, Youth and Sports
MoWRAM	Ministry of Water Resources and Meteorology
MPWT	Ministry of Public Works and Transport
MRD	Ministry of Rural Development
MoRCs	Ministry of Religions and Cults
MTDP	Mekong Tourism Development Project
NAPA	National Adaptation Programme of Action
NCDD	National Committee for the Management of the Decentralization and Deconcentration
NGOs	Non-Governmental Organizations
NIS	National Institute of Statistics
NSDP	National Strategic Development Plan
PCBs	Printed Circuit Boards
PDoE	Provincial Department of Environment
PFM	Public Financial Management
POPs	Persistent Organic Pollutants
PIPs	Public Investment Programmes
PPP	Private Public Partnership
REDD	Reducing Emission from Deforestation and Forest Degradation
RGC	Royal Government of Cambodia
3Rs	Reduce Reuse Recycle
RS	Rectangular Strategy
SLA	Sustainable Livelihoods Approach
SMEs	Small and Medium Enterprises
TVET	Technical and Vocational Education and Training
UNESCAP	United Nations for Economic and Social Commission for Asia and the Pacific
UXO	Unexploded Ordnance
WTO	World Trade Organization

SUMMARY FOR DECISION MAKERS

The National Green Growth Roadmap is produced by Cambodia for furthering development to benefit the people and conserve and restore the natural capital base to continue economic growth within the limits posed by the environmental carrying capacity.

The Roadmap has been produced through repeated consultations and interviews with all involved Line Ministries. In addition, discussions at three Inter-ministerial Green Growth Working Group (IGGWG) Meetings held in Phnom Penh throughout 2009 have contributed substantially to the contents and structure of this Roadmap. Comments and input were collected and synthesized into this document. It lays out ideas for increased multi-stakeholder collaboration in the design and implementation of projects and programmes that can further inclusive and sustainable development in Cambodia. This kind of development aims at improving resilience to adverse impacts, whilst choosing low-carbon options for “green growth” to mitigate and adapt to a changing climate.

DEFINING GREEN GROWTH

Green Growth is defined by ESCAP as a policy focus for Asia and the Pacific that emphasizes ecologically sustainable economic progress to foster low-carbon, socially inclusive development. In efforts to design a coordinated, regional response, government policymakers convened at the 5th Ministerial Conference in Seoul, Republic of Korea, in 2005. At that time, green growth was adopted by 52 Member States of the United Nations Economic and Social Commission of Asia and the Pacific (UN ESCAP) as a common path for achieving environmentally sustainable economic growth.

In light of this, the National Green Growth Roadmap proposes possible paths for short, medium, and long-term *implementation* of green growth in Cambodia. In doing so, it suggests win-win-win situations between economy, environment and society to show that economic growth, environmental sustainability and human well-being can be achieved. Adopting a holistic approach to development will help the country improve resilience and decrease vulnerability to climate change. Based largely on ESCAP’s holistic Green Growth Approach, the Roadmap is drafted with the conviction that the economy, the environment and society are not mutually exclusive but rather interdependent, deeply intertwined and integral components of each other.

IDENTIFYING THE NEEDS

Despite having made remarkable progress, Cambodia’s development has been tested on multiple fronts: erratic price fluctuations of natural resources, food/fuel/financial crisis, depleting ecosystems, water scarcities, and increased climate vulnerability. These challenges have diminished progress made towards the Cambodia Millennium Development Goals (CMDGs). Poverty and near-poverty remain high, and other human development indicators continue to reflect difficult living conditions, especially in rural areas, where the vast majority of Cambodians live and work, largely at a subsistence level. Most of the high growth over the past decade has been urban-based and narrowly focused on surging garment exports that may be vulnerable, record levels of tourism and a boom in the construction industry. Similarly, the base of major beneficiaries of development over the past decade also has increasingly narrowed. It is with these challenges in mind that the Roadmap focuses on identifying and describing interventions that can improve quality of life by focusing on increasing access to basic goods and services.

The National Green Growth Roadmap will focus on addressing seven "A"'s:

Access to clean water and sanitation;

Access to renewable energy;

Access to information and knowledge;

Access to means for better mobility;

Access to finance and investments;

Access to food security (agriculture) and non-chemical products; and

Access to sustainable land-use.

These needs for access will be addressed through green economic growth projects and programmes, including eco-efficient and resource efficient innovations, which can create opportunities and new "green jobs". While an instant paradigm shift towards green growth is not to be expected, an increased focus on access and on the implementation of ESCAP's proposed Green Growth policies will gradually bring about an economic growth model that is more conducive for human development, resilience, and environmental sustainability than the current business-as-usual approach.

THE HOLISTIC APPROACH

Current environmental and social issues are cross-cutting and deserve multi-sectoral cooperation. In addressing these challenges on a cross stakeholder level, the RGC has the opportunity to positively influence economic growth towards environmental sustainability, poverty reduction, and livelihood improvement. To this end, the IGGWG proposes several interventions over the short, medium, and long-terms. However, since the project ideas articulated in this document depend on funding and support from the donor community, it is crucial that the ministries create work plans in order to show strong commitment to the roadmap. National Green Growth Roadmap means growing Cambodia in a way to be efficient, with less resources and waste; to be clean, without polluting the environment; and to be green, with preserving greenery, waterways and the natural heritages. The RGC wants to develop its society in a sustainable way so that its future generations can enjoy both economic growth and a good living environment.

THE ROADMAP

The roadmap begins by proposing a number of interventions to aid the mainstreaming of Green Growth concerns into overall development framework of Cambodia. Such interventions will enhance inter-ministerial and multi-stakeholder cooperation.

If implemented, the suggested interventions from this Roadmap will, in the short term (2-5 Years), make a major contribution to stimulating the economy, saving and creating jobs, and protecting vulnerable groups and improve environmental sustainability. In summary the proposed stakeholders to:

- A. Create a National Ministerial Green Growth Council;

- B. Create a national public awareness and consultation process, amongst others by disseminating educational and information materials;
- C. Integrate the eco-village/eco-city initiatives into national strategic development plan;
- D. Develop national strategy for Greening industries: based on resource efficiency and 3R strategies;
- E. Develop stimulus measures for promotion of sustainable agriculture including index-based insurance schemes and/or micro-financing; and
- F. Develop a scheme for innovative investments (can carry on through-out medium and long terms).
- G. Develop measures to strengthen the national environmental industry sector

In the medium-term (5-10 years), project ideas focus on sustainable rural development – in line with Cambodia's decentralization and deconcentration (D&D) strategy; interventions to further sustainable development in sectors of agriculture, energy, forestry and water, waste management, and transportation. For the long term (10-20 years) the suggested interventions will further promote sustainable and inclusive growth and the achievement of the CMDGs for economic development and social and environmental stability. In addition, it is important that interventions in the long-term continue to enhance the viability of medium-term interventions, for instance by implementing regulations and fiscal policy tools to create incentives for green growth. This will create coherence in the development trajectory and contribute to the reduction of Cambodia's carbon dependency and ecosystem degradation. Greener and smarter development will thus improve health and overall quality of life of the people.

RECOMMENDATIONS

The RGC should actively involve private enterprises in greening the development of the private sector and mainstream the Green Growth initiatives through 1) overall awareness raising, 2) sector specific capacity development to increase eco-efficiency of production and consumption, 3) inclusion of Green Growth into Cambodian National Sustainable Development Strategy, and 4) incremental implementation of Green Growth policy tools to drive towards a sectoral greening of economic activity. Finally the participation of the Ministry of Interior is recommendable for successful implementation of Green Growth on provincial levels, involving and empowering ministerial departments to ensure that green economic growth projects are effectively mainstreamed into development planning.

I. INTRODUCTION

Cambodia is an agricultural country. Currently, 80.25% of Cambodians live in rural areas with agriculture as their primary livelihood, including farming, fishing, raising live-stock, harvesting forest and non-forest products (RGC, 2008a). Cambodia has achieved remarkable progress over the past decades in a number of areas important to human development. Access to education and health services has improved, poverty has steadily declined, and further moderate progress has been made to meet Cambodia Millennium Development Goals (CMDGs). Nevertheless, modest progress in human development still reflects the difficulty for living conditions of Cambodians, especially in rural areas where the vast majority of people lives and works largely at a subsistence level. Most of the high growth over the past decade has been urban-based and narrowly focused on surging garment exports that may be vulnerable, record levels of tourism and a boom in the construction industry (UNDP, 2007).

The Government's Rectangular Strategy, Phase II, and the National Strategic Development Plan, (NSDP) provide a broad roadmap towards improved governance, increased public investments in rural areas, and support to the development of a job-creating private sector. Meanwhile, in developing its most recent NSDP, the Royal Government of Cambodia (RGC) has decided to move away from the traditional, comprehensive planning approach to one that focuses on strategic goals and actions. The RGC is therefore declaring the most recent NSDP as the single, overarching, guiding and reference document for pursuing prioritized goals, targets and actions. Given the still-weak institutional capacities, implementation efforts will best be prioritized and targeted at areas offering the highest returns for improving human well-being, achieving shared prosperity and securing longer-term peace and stability. Agriculture, infrastructure, urban development, employment and development of human resources are the priority sectors identified in the strategy.

Creating socio-economic opportunities in these sectors must be done in a way that avoids further harm and degradation of the environment. The rapid economic and population growth coupled with overall climate change impacts has had massive negative effects on both environment and human health. It is now necessary to mainstream green growth policies into the national development strategy together with enhancing knowledge and skills of policy and decision makers to successfully mainstream important policy measures and tools for enhancing the quality of growth in Cambodia. In addition, the recent economic crisis has required economic stimulus packages to sustain economic growth in uncertain times. In planning and disbursement of such stimulus, the RGC can choose responses and investments that can yield economic growth and development that is both socially inclusive and environmentally sustainable in the medium and long terms.

The Ministry of Environment (MoE) has developed the Green Growth Roadmap to integrate ideas and projects on green growth into national strategic development. This roadmap will create the basis for environmentally sound economic development through promotion of sustainable consumption and production, greening the market and green business, development of sustainable infrastructure, green tax and budget reform, and monitoring eco-efficiency indicators. The roadmap also aims to align all relevant Ministries, institutions, NGOs, IOs, DPs and Academia to cooperate in addressing current challenges to sustainable development.

1.1 CURRENT ECONOMIC CONDITION

Currently, Cambodia's economic base is shifting away from the agriculture, forestry and fisheries sector (accounting for around 31.4% of Gross Domestic Product (GDP)) to the industrial sector accounting for around 27% of GDP (MoP, 2008). The services sector (with significant increases in tourism, real estate and other services) is one of the largest sectors in the economic development accounting for 36% of GDP and is largely driven by the tourism industry (CDRI, 2008). However, it is also reported that agriculture is still important in rural areas, where most of people depends on paddy cultivation for subsistence.

It was reported that the inflation rate reached its peak of 25.72% during the second quarter of 2008 resulting from the high oil price, the food price soaring, and the fluctuation of US dollar (MoP, 2008). It was contained to 13.46% by the end of the year. It was expected to reduce further to a single digit in 2009 (MoP, 2008). Per capita GDP rose from 1.86 million Riels¹ in 2005 to 2.42 million Riels in 2007 and is expected to rise to 3.50 million Riels. However, there has been a significant increase in consumer prices over 2008, due mainly to significantly higher increases in the Consumer Price Indices (CPI) for foods, international oil prices, and other factors. In addition, in the most recent past, Cambodia has had to struggle with Bird Flu, and HIV, but most recently incidents seems to have stabilized somewhat. There has been a significant increase in the number of foreign tourists putting existing infrastructure under considerable strain. The recent spread of pan-epidemic disease of swine flu combined with the global financial crisis has adversely impacted the Cambodian economy and delayed implementation of national policies.

In general, the economic growth is driven by the four pillars: agriculture, garment, tourism and construction. Despite the global downturn, the Cambodian economy remains in good shape (MoEF, 2007) underpinned by a continued increase in investment in agriculture, broadly based development of non-agriculture sectors, political stability, active private sector participation, reform efforts, increased official development aid and sustained foreign direct investment. It could be seen that the irrigation systems in the country are still limited with approximately 80% of agriculture being rainfall dependent (MoEF, 2007).

The RGC Rectangular Strategy, phase II; the National Poverty Reduction Strategy (NPRS) and National Strategic Development Plan (NSDP) builds upon a policy stance of economic growth and poverty reduction. The reform agenda of the RGC essentially focuses on a deepening of economic reforms and macroeconomic stability, including fiscal and monetary reform, trade and investment promotion, administrative reforms, military demobilization, and improved forestry and fisheries management.

1.2 NATIONAL STRATEGIC DEVELOPMENT PLAN (NSDP) 2006-2010

The National Strategic Development Plan (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. It is an important document of the RGC, which provided details on specific actions, programs, and projects to be carried out by Line Ministries and Agencies to achieve the national prioritized goals.

¹ According to current exchange rate on the market 1USD= 4100 Riels (September 2009).

The NSDP synthesizes goals and targets contained in the Second Five-Year Socio-Economic Development Plan for 2001-2005, the National Poverty Reduction Strategy for 2003-2005 and the Cambodian Millennium Development Goals. Government ministries and agencies, donors and civil society organizations were involved in the formulation of the NSDP and in the drafting of this National Green growth Roadmap to ensure convergence and synchronicity of efforts.

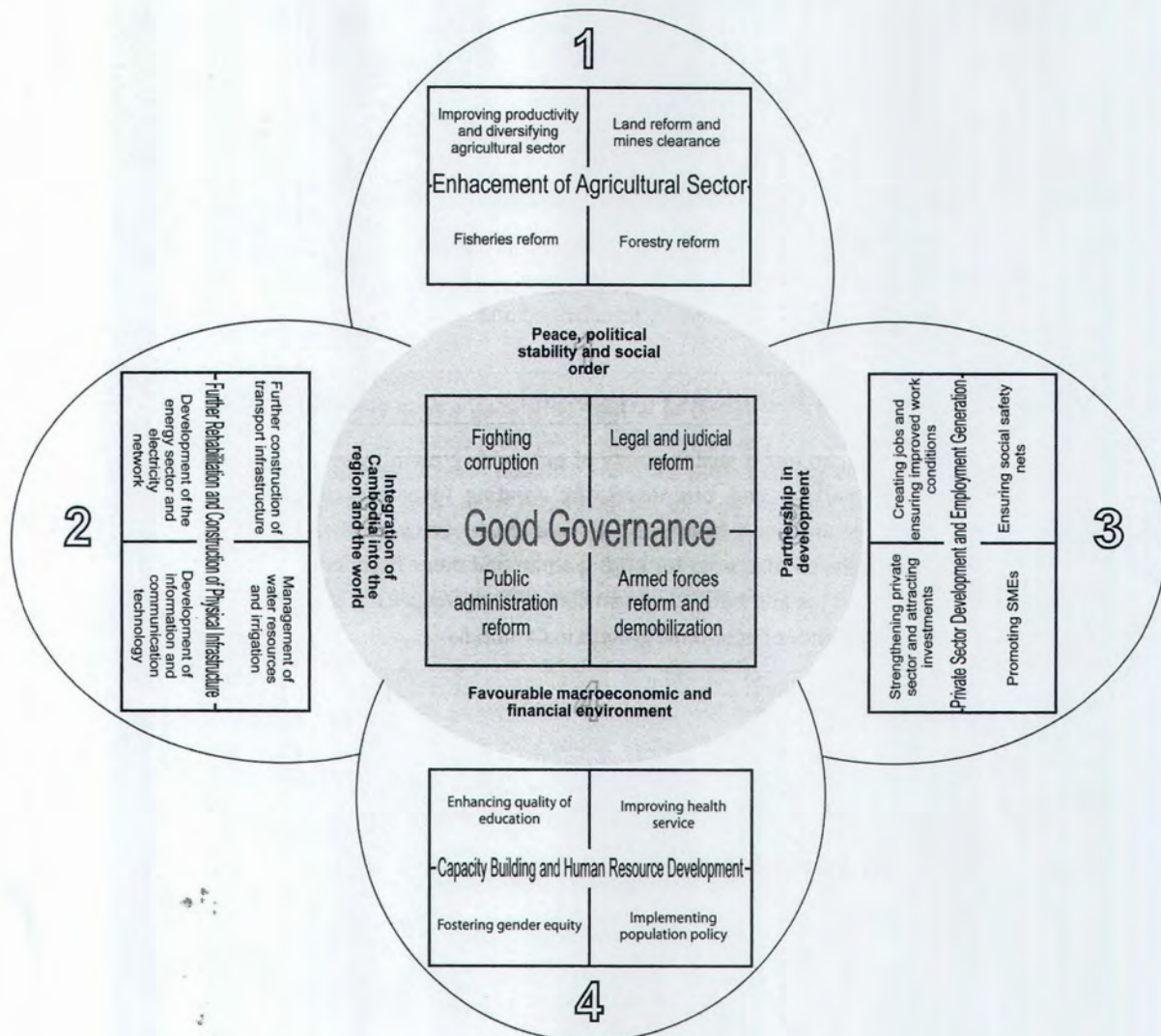
Currently, RGC has prepared the National Strategic Development Plan Update 2009-2013 (NSDP Update, 2009-2013) to provide details on specific actions, programs, and projects to be carried out by Line Ministries and Agencies to achieve national prioritized goals as stated in the Rectangular Strategy - phase II. The NSDP Update (2009-2013) articulates two primary goals. First, the reason for preparing this plan is the need for the synchronization of the period covered by the NSDP with the term of the fourth legislature of the Royal Government. Second, the preparation of this document is intended to update the NSDP (2006-2010) by taking into account the potential impact of the global economic downturn on Cambodia's economy.

1.3 THE RECTANGULAR STRATEGY (RS)

The Rectangular Strategy (RS) for growth, employment, equity and efficiency is a holistic and integrated document proclaimed by RGC during the early part of its third mandate in 2004. It has been reaffirmed for the fourth term (2008-2013). The RGC has considered the Rectangular Strategy, Phase II (RS-II) as its "socio-economic policy agenda". It is still relevant in the fourth mandate in which in the paragraph (40) states that "in order to ensure sustainable economic growth, which is *sine qua non* for employment creation and income generation, the RGC will continue to foster the diversification and strengthen the competitiveness of the Cambodia's economy by assuring a highly conducive climate for both public and private (domestic and foreign) investments for the development of the following important sectors: (1) Agriculture; (2) Water and Irrigation Systems; (3) Transport Infrastructure; (4) Electricity; (5) Human Resource Development; (6) Labor-Intensive Industry and Food Processing Industry for Exports; (7) Tourism; (8) Exploitation of Oil, Natural Gas and other Minerals; (9) Information and Communication Technology; and (10) Trade" (RGC, 2008). In line with these priority sectors, the Roadmap focuses on all the sectors that are conducive for economic growth *and* environmental sustainability.

Moreover, the RGC set out the RS as a supporting tool to implement its political platform in the third legislature of the National Assembly and continue to the second phase to attain poverty reduction, development, progress, prosperity, national harmony and happiness of the Cambodian people. The RS is an integrated structure of interlocking Rectangles (see below).

RECTANGULAR STRATEGY



II.OVERVIEW OF THE GREEN GROWTH ROADMAP

2.1 VISION: PROSPERITY AND SUSTAINABLE LIVELIHOODS

The National Green Growth Roadmap envisions a combination of objectives for economic growth and development, human well-being, and environmental quality, which will promote the improvement of Cambodian livelihoods. Similar to how economic growth is a precondition for human development, environmental sustainability is integral to both economic growth and the well-being of the Cambodian nation as a whole. The overall vision of National Green Growth Roadmap is to make Cambodia a livable and lively country so that Cambodians love and are proud to call home.

In light of this, the National Green Growth Roadmap proposes a number of possibilities for *win-win-win* situations between economy, environment and society to show that rapid economic growth, environmental sustainability and human well-being can be achieved without long-term trade-offs. Based largely on ESCAP's holistic Green Growth Approach, the Roadmap is drafted with the conviction that the economy, the environment and society are not mutually exclusive but rather interdependent, deeply intertwined and integral components of each other.

2.2. GOAL: GREENING OF ECONOMIC DEVELOPMENT

Overall, Green Growth initiatives can foster sustainability of economic growth by enhancing sustainable consumption and production, by greening markets and businesses, by creating favorable climate for the establishment of sustainable infrastructure that in turn can enable the population to enjoy increased access to crucial goods and services and to ensure equal access to resources for both women and men. The incremental implementation of fiscal policy instruments such as a green tax and budget reform can send strong pricing signals and act as a powerful driver for increasing the overall eco-efficiency of economic growth in Cambodia.

2.3 OBJECTIVES

This Roadmap combines the overall objectives of pre-existing development strategies with the establishment and maintenance of Green Growth, defined as *environmentally sustainable economic progress that fosters low-carbon, socially inclusive development*. In Cambodia, Green Growth aims to unify development and environment objectives by means of implementing policies tailored to address the needs of all, including the most disadvantaged, to create jobs, to increase the resilience of the environment and of the population to adverse impacts, thus sustaining economic growth and human and environmental well-being in the long term. This roadmap is also intended to promote women's status for the realization of a gender-equal society.

The National Green Growth Roadmap will focus on addressing seven "A"'s:

Access to clean water and sanitation;

Access to renewable energy;

Access to information and knowledge;

Access to means for better mobility;

Access to finance and investments;

Access to food security (agriculture) and non-chemical products; and

Access to sustainable land-use.

These needs for access will be addressed through green economic growth projects and programmes, low carbon solutions, including eco-efficient/resource efficient innovations, which can create new "green jobs" for the population. While an instant paradigm shift towards Green Growth is not to be expected, an increased focus on access and on the implementation of Green Growth policies, will gradually lead the country towards an economic growth model that is more conducive for human development and for environmental sustainability than the current business-as-usual approach.

III. THREATS

3.1 POPULATION GROWTH

The relationship between population growth and economic development has been extensively studied. Some studies stressed that population growth may have a beneficial, neutral or detrimental effect on economic growth depending on the socio-economic characteristics of a country (MoP, 2008). However, it is clarified that rapid population growth has had a negative effect on economic growth resulting from the large existing deficiencies in infrastructure, limited productive capacity, un-employment and under-employment, as well as poor provision of health and education services (MoP, 2008). Meanwhile, the Government recognizes that a continuing high growth rate of population creates serious difficulties in the implementation of its programme for poverty alleviation and sustainable economic development. A large population means larger requirements in terms of food and public services such as education and health care.

Rapid urban growth aggravates environmental degradation. In addition, the rapid population growth is one factor that could be viewed as an obstacle to green growth. The challenge will therefore be to create sufficient employment possibilities in the private sector to embrace a very young population, with more than half of citizens currently less than 21 years of age (CIA, 2009). However, despite the difficulties in initial investments into health services, education, and infrastructure, the Government also realizes that investments into human capital is one of the most important pre-conditions for sustained economic growth and must be invested in, along with other parts of the economy. Training for green and decent jobs that can improve livelihoods of the people whilst positively contributing to the restoration and/or maintenance of the environment can therefore be seen as an opportunity to enhance the greening of Cambodian economy and to improve the stock of human capital in Cambodia.

3.2 POVERTY STATUS

Poverty was identified as the biggest challenge to Cambodian society. Among the population of 13.04 million in 2004, the total number of people below the food poverty line is 2.6 million and the number below the total poverty line is 4.7 million (MoP, 2008). In light of the significance of poverty, more pressure is exerted on the natural resources, which poses a great challenge for the streamlining of the green growth concept into the national development plan. Before the people consider the environment, they need to first consider their livelihoods. However, the government has a very central role to play in facilitating interventions that can address both poverty and environment simultaneously. This fact makes a statement about the importance of rural development and it is therefore implicit that the projects in this Roadmap must further rural development to alleviate the prevalent poverty in the country.

3.3 LEGAL AND POLICY FRAMEWORK:

Cambodia has limited regulations and trained personnel to effectively monitor implementation of sustainable development activities. There are many laws and regulations developed but no specific law or policy on green growth, and the dissemination of these laws to the people is still rather limited. Therefore, existing legislation related to sustainable development needs to be reviewed and strengthened in order to reach green development approaches. Furthermore, there is still limited understanding of the green growth policy tools from the stakeholders. However, the Ministry of Environment has a "core" set of responsibilities that must be implemented as part of the governmental mandate in order to mainstream the concept into legal and policy framework.

3.4 ENVIRONMENTAL PRESSURES:

Over the last two decades, Cambodia has experienced rapid economic growth resulting in significant poverty reduction. However, the convergence of the recent economic crisis with region-wide food/fuel supply bottlenecks and climate change variability demonstrates that these gains have been made largely at the expense of the environment. The deforestation, caused by illegal logging and land encroachment, is the most serious threat to Cambodia's environment. Forest cover having fallen from 73% in 1965 to less than 50% in recent years (CDRI, 2008). It is noted that there are multiple negative effects of such significant deforestation including impacts on biodiversity, water retention and increased soil erosion of deforested lands. The loss of forest not only results in the loss of habitats for many species of animals and plants, but the loss of carbon sinks contributes indirectly to growing CO₂ emissions (CDRI, 2008).²

Another environmental pressure is solid waste disposal. It is a major environmental problem, especially in the provinces (M. Sidet, 2008). However, MoE has delegated powers to the Provincial Department of Environment (PDoE) to manage waste in their constituencies. In addition, MoE has issued a general guideline on disposal, collection, transport, storage, recycling, minimization, and dumping of household waste on provincial levels.

Meanwhile, Phnom Penh Municipality has articulated a clear development strategy for waste management by considering water, land and air sectors as main concerns. The municipality has promoted clean water supply; built physical infrastructure (such as sewage and drainage systems); built flood prevention banks; replaced existing dumping sites to new and larger ones with better facilities; promoted public transportation and improved the standard of sidewalks in the city.

The discharge of wastewater into the river systems especially for provinces located along the Mekong River and the Tonle Sap Lake and its main tributaries is another concern (M. Sidet, 2008). There is also no proper management plan for the collection, storage, treatment and discharge of wastewater. Land encroachment, deforestation and economic use of natural resources in protected areas has increased, resulting in environmental concerns (M. Sidet, 2008). In addition, there are other environmental concerns deriving from mineral exploration activities and hydropower dam development projects.

² However, the government has strongly committed to maintaining 60% of the total forest cover by 2015.

3.5 OPPORTUNITIES:

In consultation with government representatives during Inter-ministerial Green Growth Working Group (IGGWG) meetings, it was agreed among stakeholders that it is crucial to create an enabling environment for green investment in order to stimulate domestic economy and foster new green job growth. The government should actively involve private enterprises in greening the development of the private sector. Green activities should be promoted in this sector by 1) awareness raising; 2) sector specific capacity development to increase eco-efficiency of production and consumption (it should involve institutions, ministries, NGOs and academia to mainstream the Green Growth concept); 3) inclusion of Green Growth into National Strategic Development Plan; and 4) incremental implementation of Green Growth policy tools to create financial incentives for sectoral greening of the private sector.

Environmental and social issues are cross-cutting and therefore deserve multi-sectoral cooperation. By working together across ministries, the RGC has the opportunity to address environmental and developmental concerns across sectoral boundaries. To this end, the IGGWG proposed several projects, whose realization will depend on the availability of funding and donor support. After endorsing this roadmap, ministries must create work plans to show strong commitment to green growth. As pointed out above, awareness raising is an important for the promotion of Green Growth activities in Cambodia. The Ministry of Religions and Cults (MRC) can aid the mainstreaming of environmental knowledge by promoting Green Growth as a qualitative alternative to rampant consumerism. This ministry could synergize the Green Growth message of inclusive sustainable development with pre-existing Khmer moral and spiritual values.

Moreover, participatory formulation of project and discussion with stakeholders on a local level is necessary to ensure project sustainability and integration of the concepts on district levels. The participation of MoI would be conducive for successful implementation of Green Growth on local level, since this ministry is implementing the Decentralisation and Deconcentration (D&D) policy. Cambodian representatives could help the MoI by forming working groups across departments within each ministry. These working groups should then meet with other ministries' working groups to enhance synergy and cooperation for Green Growth, while the facilitating role should remain with MoE. Moreover, other national stakeholders (NGOs, Academia, and Private Sector) should be involved in the projects outlined in the Roadmap.

3.6 DRIVERS OF GREEN GROWTH

Public spending represents a primary driver of economic growth. Thus, the current economic downturn should not be viewed in a negative light, only because increased government spending into infrastructure and employment creation is necessary. The need for increased public spending represents a great opportunity, because in preparing the public spending, the RGC can identify the right sectors for green investment and ensure that funds are used for environmentally sustainable development that has potential for job creation. The D&D of the governmental administration also represents a major driver for implementing Green Growth on the local level, where the right measures can spur sound agricultural development in rural areas.

IV. PATHS TO GREENING THE ECONOMIC DEVELOPMENT

It is clear evident that Cambodia has to continue its economic growth to reduce poverty and to achieve social progress. It is also reality that the increasing economic development will contribute to increasing environmental degradation, climate change and diminishing natural resources. In this light, in order to achieve Green Growth Approach, it is crucial to change the conventional development from “grow first, clean up later” to a more responsible long-term attitude. To navigate towards a sustainable development path and adapt to climate change, National Green Growth Roadmap set seven accesses as described in the objective. In order to reflect the 7 accesses, there are three main interventions are identified: short-term, medium-term, and long-term interventions.

4.1 SHORT-TERM INTERVENTION (2-5 YEARS)

In the short-term, several insights and activities are indentified by IGGWG and need to be effectively carried out. In order to set the stage for successful implementation of Green Growth in the medium and long terms, the following interventions are of high priority:

- A. Create a National Ministerial Green Growth Council;
- B. Create a national public awareness and consultation process, amongst others by disseminating “Greening Workplace” and “Greening Home” educational materials and information posters;
- C. Integrate the eco-village/eco-city initiatives into National Strategic Development Plan;
- D. Develop national strategy for Greening industries: based on resource efficiency and 3R strategies;
- E. Develop stimulus measures for promotion of sustainable agriculture including index-based insurance schemes and/or micro-financing to increase resilience in rural communities;
- F. Develop a scheme for innovative investments that can carry on through-out medium and long terms and consist of:
 - a. Payment for Ecosystem Services;
 - b. Green Tax and Budget Reform; and
 - c. Swap of debts schemes with international investors; and
- G. Develop measures to strengthen the national environmental industry sector

4.2 MEDIUM-TERM INTERVENTION (5-10 YEARS)

In this stage, there are five main priority projects are proposed. Moreover, some of these can be continued to undertake in the long-term interventions.

1) ECO-VILLAGE

Eco-Villages are urban or rural communities of people, who strive to integrate a supportive social environment with a low-impact way of life. To achieve this, they integrate various aspects of ecological design, permaculture, ecological building, green production, alternative energy, community building practices, and much more. To effectively implement the Eco-Village which could lessen the pressure on the environment, the collaboration among many ministries is required, including: Ministry of Environment (MoE); Ministry of Agriculture, Forestry, and Fisheries (MAFF); Ministry of Industry, Mines and Energy (MIME); Cambodia's Chamber of Commerce (CCoC); Ministry of Land Management, Urban Planning and Construction (MLMUPC); Ministry of Rural Development (MRD); Ministry of Interior (MoI); Ministry of Women's Affairs (MoWA); Ministry of Education, Youth and Sports (MoEYS); Ministry of Labor and Vocational Training (MLVT); the Ministry of Religions and Cults (MRCs); Ministry of Health (MoH); Ministry of Economy and Finance (MEF); and Ministry of Tourism (MoT).

With regards to development of eco-villages, the MoE plays a central role in promoting environmental education to local communities to strengthen capacity towards managing their environment sustainably and raise awareness on the impact of hazardous waste on human health. However, such task must necessarily be supported by several ministries and the task of implementing Eco-Village concepts deserves a multi-stakeholder approach.

The MoE should also consider implementing the Green Village/Green Flag Award Scheme in order to attract commitment from local communities to participate in the protection of the environment through practicing waste management, environmentally sound sanitation, and eco-efficient use of natural resources etc. The Award Scheme can also contribute to improving the scope for environmentally sustainable economic activities.

In addition to the Award Scheme, the MoE should continue to strengthen and implement its existing strategic plan for coastal zone management to ensure that the tourist areas do not degrade but remain attractive for visitors. There is also a need to monitor the implementation of all public infrastructure projects to ensure that their implementation is environmentally sound. In addition, MoE should promote public participation in environmental protection and natural resource management so that people are informed and can participate in decision making processes regarding their environment.

It is also necessary for Phnom Penh Municipality and other local authorities to continue to implement and further strengthen its development strategy to promote clean water supply, build physical infrastructure (such as sewage and drainage systems), create flood prevention banks and upgrade existing dumping sites with better facilities for proper waste segregation. Moreover, the municipality can strictly enforce the traffic law, promote public transport and improve existing sidewalks for pedestrians. In addition, the municipality should promote tree planting and refurbish resorts to create green spots for rest and recreational activities. Eco-village projects also deserve the participation and cooperation from MAFF. This ministry should continue to plant trees along the roads and streets in the villages, in the pagodas and at schools and other public areas. In doing so, they can contribute markedly to restoration and improvement of the environment, and create green jobs for landscaping and gardening amongst the rural population. The MAFF should also further promote non-chemical options for fertilizer and pesticide for farmers so they can begin to grow organic products and thereby ensure sustainable land-use. Alternatively, the government can use revenues from resource-use taxes to establish an index-based micro insurance scheme granting farmers an option for managing weather risks. These schemes can be designed to favor organic agriculture to create incentives for green business growth in this sector and enhance environmentally sustainable food security.

MIME should continuously implement its ongoing policies on promotion and support of small and medium enterprises (SMEs) dealing with: the expansion and acceleration of the "one village, one product" program; ensuring the continuous improvement of local/domestic products; assisting SMEs in enhancing their productivity and reduce production costs; promoting vocational skills and training; supporting newly established industries in

their start-up phase; promoting the linkages between SMEs and large enterprises to create access to larger market supply chains; strengthening mechanism for the protection of industrial intellectual property rights; reducing registration procedures and start-up processes for companies; and introducing and demonstrating the Cleaner Production to SMEs. MIME needs to conduct training and awareness raising to enhance the productivity and improve the quality of production to improve competitiveness both domestically and internationally. MIME also needs to continue promoting cleaner products and careful management of chemicals. It is necessary that MAFF and MIME cooperate with CCoC to create the right access for products to the supply chain of the market. Therefore, the CCoC should continue to play a role as representative of the commercial, industrial, agricultural, crafts and services communities to facilitate coordination with the state authority and promote environmentally sound private sector development. In addition, the promotion of the use of bio-digester should be increased because this practice can provide both electricity and organic fertilizer for agriculture products.

Land management also plays a vital role for Eco-Village in order to ensure the sustainable environmental protection and sustainable land use. Land tenure in the rural areas can benefit rural development through making guidelines for land use, increased ownership and security, and increased transparency of land markets. The government can promote eco-city and/or eco-village concepts to create diversified income sources thereby further building on the positive momentum created by land tenure. This endeavour can be approached by MLMUPC MoE, MoRD, MAFF, and MoLVT, in unison. To further enhance environmental protection and improve coordination and cooperation between ministries, the effective enforcement of some sub-decrees and policies could be taken into consideration: 1) the sub-decree on the procedures for commune land use planning that was adopted in 2009 with the aim to identify guidelines, mechanisms and procedures for commune land use planning; 2) the sub-decree on procedures of registration land of indigenous communities in 2009; 3) the policy on registration and right to use lands of indigenous communities in 2009; and 4) the declaration of the Royal Government of Cambodia on Land Policy. Land reform plays a critical role in increasing agricultural production and national food security, it has been a focus on the reforms relating to security of tenure, especially among farmers and vulnerable minorities (CBNRM, 2009). In addition, MLMUP plays an important role in spatial planning for land development, especially in planning for eco-village development so as to avoid all negative impacts caused by land development-related activities.

To fortify the eco-village implementation, MRD has to further develop the Rural Water Supply and Sanitation Sector to provide water that meets the appropriate standards for domestic consumption to all inhabitants of rural areas. The ministry must also identify ways to safely manage human waste to minimize the transmission of water borne diseases. On one hand, MoEYS can be considered as an important player for the national ecosystem management and control of environmental degradation. It can involve in the promotion and provision of environmentally sound technologies and improve access to clean water and adequate sanitation facilities in both rural and urban areas. On the other hand, to ensure broadly access and reach, the integration of the eco-village concept into education policy and curriculum is important. It can mainstream the eco-village concept to all students ranging from primary school to university. Furthermore, MLVT should continue with its two existing empirical fields: Labour, and Technical-Vocational Education and Training (TVET) to ensure that capacity and green skills are built among the rural population. Meanwhile, the provincial governments can implement resource use taxes (green taxes) whose revenues can be recycled either to help the financing of TVET for green skills, such as sustainable agriculture practices, or to grant government backed loans for environmentally sound technologies to the rural population.

Historically, Cambodia is a Buddhist country with more than 80% of total population practicing Buddhism. Therefore, the integration of the Eco-Village concept to the local people can benefit from MoRCs participation. This

ministry can promote Green Growth as a qualitative alternative to resource intensive economic growth strategies. In doing so, the ministry could synergize the Green Growth message of inclusive sustainable development with pre-existing Khmer moral and spiritual values as taught through the Dhamma.

In reality, MoT (2008) reported that the tourism sector has emerged as a major driver of economic growth with 2,125,465 international visitors in 2008. It is expected that this figure will increase in the next several years. To ensure the increasing number of tourists, MoT should continue to implement the classification of tourist resorts and sites for tourism development in the provinces that have potential for tourism development. Currently, home stays, eco-lodges and other small infrastructures in rural areas undertaken by MoT in collaboration with ADB should be further increased. The Mekong Tourism Development Project (MTDP) is in charge of administering this project with the aim to help the community ecotourism project in the northeast provinces of the country. Therefore, the ADB could consider expanding this project.

Eco-Villages can potentially become a tourist attraction, because most of the tourists value a clean environment. Thus, tourism areas must be managed with a view towards environmental sustainability and the use of slogans like "Clean City, Clean Resort and Good Service + Green Village" may be useful to mainstream and promote good practices in tourism areas. Increase in tourist numbers also represents a significant opportunity for expansion of employment and improvement of livelihood conditions of local communities.

2) SUSTAINABILITY OF WATER RESOURCES

Access to water plays an important role in poverty reduction, development of options for economic diversification, enhancement of food security, and conservation of the environment. In other words, water is a fundamental resource for sustainable development in several sectors, including: agriculture, industry, energy, domestic use, navigation, tourism, fisheries. Water is crucial for maintenance of eco-systems in general. Maintenance of this crucial resource thus requires cooperation and collaboration among Ministry of Water Resources and Meteorology (MoWRAM); Ministry of Agriculture, Forestry, and Fisheries (MAFF); Ministry of Rural Development (MRD); Ministry of Industry, Mines and Energy (MIME); Ministry of Environment (MoE); Ministry of Land Management, Urban Planning and Construction (MLMUPC); Ministry of Women's Affairs (MoWA); Ministry of Interior (Mol); Ministry of Education, Youth and Sports (MoEYS); and Ministry of Tourism (MoT).

While approximately 90% of the urban population is enjoying access to water, Cambodia is still providing insufficient and low-level technology for waste water treatment and water use is as of yet unsustainable. Moreover, insufficient access to proper sanitation and water of sufficient quality has increased the incidence of water and vector borne diseases source.

MoWRAM is considered the primary agency to deal with the water related issues. Therefore the agency should continue its existing policy on the major functions of water for: agriculture; energy; industry, small manufacturing enterprises and services; domestic use; and tourism. This policy is not merely covering fresh water resources, but also includes coastal and marine waters, and marine water protection and conservation. MoWRAM should continue to raise awareness among the people in both coastal and inland areas to increase public understanding regarding the crucial role of water for daily life and socio-economic development and promote public participation in effective, sustainable maintenance, management, conservation, and use of water resources. The maintenance of water infrastructure can create jobs in generating income for the poor. In terms of legal framework, there is a need to effectively enforce several sub-decrees related to water including: farmer water use; river basin management; water licensing; and water quality. There is also a need for effective enforcement and

implementation of the water resource management law and a policy for sustainable irrigation that can place greater focus on integrated water management. Moreover, water use can be addressed by the government through implementation of a life-line tariff and progressive taxation to create incentives for the industrial sector to improve their efficiency of water use. By implementing water pricing through metering consumers, the government can recycle a percentage to finance the expansion of water services to excluded households. In other words, there is a need for continuing to improve and fortify the national drinking water standard and a necessity for integrating water harvesting technology into building codes to fully harness the potential for rainwater harvesting. Such intervention will enhance to increase resilience to improve access to water among citizens.

Regarding forests, water resources cannot be sustained unless the forest is effectively protected and vice versa. Forestry resources play a very important role for the maintenance of the hydrological cycle. Thus, MAFF should continue to promote effective forest management both in forest concessions and forest communities. Even so, there is already an existing plan that emphasizes fairness and environmental sustainability to minimize the impact of natural disasters i.e. floods, droughts on livelihoods and public property. The government should encourage cooperation between MoWRAM and MAFF to ensure effective management of water resources to avail the local communities' access to water- both for household consumption and for irrigation of agriculture crops. Water resource management is a cross-cutting responsibility. In fact, MRD is seen as one of the main players for managing of water resources. MRD has developed a policy on indigenous people, and formulated rural development policy and strategy. Therefore, MRD has to continue to implement its policy on providing rural water supply in a sustainable manner to avoid negative impacts on health and the environment. A central priority will be to provide access to safe water for every citizen. This will ensure that every person can access safe water and sanitation services. Moreover, MIME has developed a National Policy on Water Supply and Sanitation to response to the priorities of the Rectangular Strategy. The policy is developed to improve people's livelihoods and welfare by ensuring sufficient low-cost water supply and sanitation services by devising a sustainable and environmentally friendly sanitation system. This policy could benefit from encouraging public private partnerships and should provide low-cost water services to the poor to improve their situation.

Simultaneously, MoEYS has been implementing the child friendly school policy, which in dimension 3 identified the health, safety and protection of children. This policy aims to ensure that all children are cared for and supported by people and institutions. Therefore, the additional introduction and implementation of the use of clean water and clean environment to the child friendly school policy should be continuously implemented. In fact, insufficient and poor water condition, can pose considerable negative impacts. This affect also includes the tourism sector. The access to the clean water is crucial for development of tourism sector. Low quality of water can generally affect the health of tourists and consumers. Thus, a requirement is needed to further control water quality in tourism areas and improve waste management to maintain good quality of water. Therefore, MoT has to constantly cooperate with MoWRAM, MoE and MAFF for water quality control and management.

3) SUSTAINABILITY OF AGRICULTURE, FORESTS AND ENERGY

Sustainable agriculture can effectively improve food security and reduce poverty. It promotes the production of food with the least impact to the environment. Sustainable agriculture offers opportunities to achieve economic development, can create jobs to reduce poverty, and minimize the GHG emissions. By using little or no chemical pesticides it can also help to ensure food safety of consumers and provide food security for smallholder farmers. Sustainable agriculture can, on a longer term, offer trade opportunities for developing countries, and restore degraded ecosystems.

The RGC considers the ecologically, socially, and economically viable conservation and management of forest resources as a major pillar of public welfare directly contributes to environmental protection, poverty reduction and socio-economic development (RGC, 2002). Thus, RGC should continue to implement its commitment to conserve and manage the country's unique forest resources in a sustainable manner. Meanwhile the energy sector has increased due to the rapid growth of the economy. In this light, sustainable agriculture, forests and energy are of critical importance for the lives of small farmers and other rural poor by enabling them to increase food production and income. The cooperation and collaboration among line ministries includes: Ministry of Agriculture, Forestry, and Fisheries (MAFF); Ministry of Water Resources and Meteorology (MoWRM); Ministry of Environment (MoE); Ministry of Industry, Mines, and Energy (MIME); Ministry of Land Management, Urban Planning and Construction (MLMUUPC); Ministry of Rural Development (MRD); Ministry of Women's Affairs (MoWA); Ministry of Interior (MoI); Ministry of Health (MoH); Ministry of Commerce (MoC); Ministry of Economy and Finance (MEF); Cambodia's Chamber of Commerce (CCoC); and Ministry of Tourism (MoT) is necessary to strengthen sustainable resource management.

To promote the overall sustainability of agriculture, forestry and water resources, government representatives have suggested pilot/demonstration projects to promote the use of biogas for energy production (special emphasis is put on this sector in the previously mentioned Eco-Village/Eco-City Award Scheme). A concerted strengthening of the existing forestry law, outlining Protected Environment Areas, as well as increasing the use of renewable energy technologies, has the potential to minimize illegal logging. The former requires policy reforms suited to national and especially local circumstances such as monitoring, evaluation and could benefit from involvement of the Ministry of Interior. These initiatives can also be combined with promoting more sustainable land management practices and integrated forest management, such as re-training loggers to work as eco-tourism guides. In addition, the introduction of an auctioning mechanism to control logging, coupled with performance guarantee mechanisms, concession fees or excise taxes at sawmills can also lessen the strain on forests. On a national level the execution of forest carbon inventories can help Cambodia become eligible for credits from the REDD programme. The introduction of A/R CDM project shall be considered to ensure forest cover. This project can help Cambodia to reach its commitment to maintain 60% forest cover by 2015. Furthermore, this project does not only increase forest cover but also enhance carbon sequestration/carbon stock to mitigate the global warming and it also can reduce poverty of local communities through providing green job opportunity.

MAFF should continue its agricultural development plan with the overall goal of poverty reduction and economic growth through agriculture sector development including sound chemical management and non-chemical use options. The sectoral plan is intended to ensure food security, increase income, create employment and improve nutrition status for all people by improving the productivity, diversification and commercialization of environmentally sound agriculture (MAFF). In addition, in order to reach sustainable agriculture, MAFF has to consider the conservation of water and soil resources, integrated pest management and reduction of non-point source pollution. Meanwhile, Sustainable agriculture cannot be maintained without participation by the MoWRAM because this ministry plays a significant role for promoting sustainable irrigation infrastructure, effective and efficient management of water catchments, rivers, lakes, streams and other water sources to supply water use during the dry season. It can also control adverse impacts of floods through developing and improving effective weather forecasting. Therefore, MoWRAM should provide more opportunities for communities and relevant stakeholders to engage in the protection, conservation, management and/or use of water resources reflecting the real demand. The establishment of sustainable land use planning is needed to avoid the negative impacts on the environment and to ensure the right direction of land development that is under the jurisdiction of MLMUPC.

In terms of forest resources, the use of fuel wood for some manufacturing process of difference product, has environmental and health impacts. Deforestation for infrastructure development and from agricultural extension also causes stress on existing forests. Therefore, it should be required that MoE and MAFF continue to strengthen

in implementing of existing laws to ensure sustainable forest management and further promote public participation in environmental protection and natural resource management so that people are able to access information and participate in decision-making processes concerning their environment.

In addition, maintenance of the forest cover is vital for the stability of ecosystems, for the prevention of soil erosion, as catchments of rain fall, and as carbon sinks. In 2007, the RGC approved its National Adaptation Programme of Action to Climate Change (NAPA). It serves as the basis for short-term climate change adaptation activities in the country and implementation of this programme should be promoted. When MoE developed NAPA, a fundamental finding for climate change adaptation was the maintenance of forest cover. This programme should therefore be implemented and revised at least every five years to reflect emerging adaptation priorities and to identify the adaptation needs of the Cambodian people. Furthermore, GHG mitigation projects, both under the Clean Development Mechanism (CDM) and voluntary markets, have been implemented in Cambodia with some success, mainly in the field of renewable energy. These types of projects need to be further promoted and expanded to cover new areas with untapped mitigation potential, including energy efficiency, agriculture and forestry.

Cambodia needs to be well prepared to participate in future post-Kyoto climate regimes such as Reducing Emission from Deforestation and Forest Degradation (REDD) and forest conservation activities, both within forest areas under the jurisdiction of the MAFF and protected areas under MoE management. Therefore, the implementation of REDD and REDD+ should be also taken into account to ensure both quantity and quality of the forests. It is crucial to improve rural access to electricity to meet the rising demand of power for the growing economy. It required to shift from traditional public sector lending operations for electricity to 1) effective implementation of ongoing public sector projects, 2) support for private sector operations, and public private partnerships and 3) support for analytical, policy and technical work on renewable energy (ADB, 2007). Renewable energy technologies can be developed to meet the energy demand in rural and remote areas, especially in off-grid areas to raise the living standards of the rural population. The renewable energy strategy plan has to be constantly and effectively implemented include options for hydropower, solar power, biomass/biogas, wind power, etc to assure and facilitate the access of rural electricity by the local communities (MIME, 2006). To build on this plan, the increased use of renewable energy in rural areas combined with an increased protection of existing forests can have positive effects on human health and on poverty reduction. The MoC, MEF, MoP, MIME, and MoEYS can aid and facilitate the mainstreaming of renewable energy options by reducing import tariffs on Environmental Sound Technologies (ESTs).

Meanwhile, MoWA is considered as one of the main fronds for natural resource management. MoWA needs to formulate and implement clear policies and set up its own guidelines, strategies and plans to ensure gender balanced access to education, training, proper nutrition and health services and access to and management of natural resources. In addition, the CCoC should continue to improve enterprise efficiency for the interest of the commercial, industrial, agriculture, crafts and service sectors and the economy in general. Finally, it should also prepare and disseminate commercial and economic statistics, and conducts research on commercial issues and promote efficiency of production and eco-tourism. It is evident that the development of agriculture is extremely critical for tourists, because a lot of tourists buy agriculture products. In fact, around 6.7 million domestic tourists along with 2.1 million foreign tourists - in 2008 alone - bought Khmer Agricultural Products and food. To link agricultural production with the markets, the development of a policy or strategy is needed by encouraging hotel and restaurant owners to use more local products for food, including organic foods and other products – with the added requirement for a certification and labeling system. It is evident that currently only a few hotel and restaurant owners use domestic food and products.

4) SUSTAINABILITY OF WASTE MANAGEMENT

Presently, the most pertinent challenges in waste management include: toxic pollution from laundry factories and from the garment sector; unduly disposed wastes from vehicle servicing stations (oils, lubricants, coolants); household wastes due to limited awareness; medical wastes (i.e. needles and chemicals); and limited monitoring of imported second-hand products in the automobile sector (vehicles, tires, etc.), and electronic waste (E-Waste). To achieve sustainable waste management, Ministry of Environment (MoE) has to closely work with Ministry of Agriculture, Forestry and Fisheries (MAFF); Ministry of Industry, Mines and Energy (MIME); Ministry of Water Resources and Meteorology (MoWRAM); Ministry of Public Works and Transport (MPWT); Ministry of Commerce (MoC); Ministry of Economy and Finance (MEF); Ministry of Health (MoH); Ministry of Planning (MoP); Ministry of Education, Youth and Sports (MoEYS); Phnom Penh Municipality; Ministry of Women's Affairs (MoWA) and Ministry of Tourism (MoT).

Interventions that can improve the environmental quality of waste management include: environmental awareness campaigns on community levels; identifying and monitoring of proper dumping sites; better enforcement; education of youths on the importance of the environment; control of the importation of second hand goods; and promotion of local level self-governance and leadership to improve decentralised coordination of these efforts. In the identification of proper dumping sites, the Cambodian government can implement quantity-based pricing for domestic and municipal solid waste such as tipping fees to foster greater recycling practices. The introduction and encouragement of the use rubbish bin segregation to segregate different types of waste shall be considered to ensure effective management. There is also a need to improve and effectively enforce the sub-decree on solid waste management applying not only to the proper management of solid wastes and/or garbage, but also to the management of hospital waste, industrial waste and other hazardous waste (including transportation, storage, disposal, treatment, etc of the waste). Apart from sound management strategies, the RGC can also look into waste-to-energy options including options for bio-digesting or waste incineration. Whether disposed of or incinerated, in urban areas, Phnom Penh Municipality could focus efforts on improving urban waste management by upgrading facilities for solid waste transportation and disposal (Phnom Penh Municipality).

In addition to regulatory, awareness and control-and-command options for improving waste management, fiscal policy tools such as taxes on environmentally harmful substances and products e.g. plastic bags, chemicals, hazardous waste, and nitrogen based fertilizers, can successfully limit the use of these unsustainable products while at the same time create an environment favorable for green products and services. These issues can be dealt with in cooperation of MoE, MAFF, MIME, MoP, MEF, and MoC. Concerning waste management in the forests, MAFF can stimulate forest concessioners to effectively collect and manage waste from forest harvesting. The promotion of green-business and green products should be continued to increase resource efficiency and increase life-cycle approaches to production of commodities. This way, waste would not be created in the first place. Such change in products and services may be more labour intensive than business-as-usual, but would also further employment generation by for instance, the promotion of cleaner products to ensure sustainable development of industry, careful management of the chemical products concerning Persistent Organic Pollutants (POPs) and Printed Circuit Boards (PCBs).

Additional management of hazardous substances can be achieved through restricting and phasing out the import and use of products containing POPs and PCBs. Aside from that, MIME should continue to promote and strengthen

the capacity of industrial waste management from factories. Main activities include the provision of technical support such as training, technology modification, development of guidelines, evaluation and regulation support. MIME can continuously introduce and demonstrate cleaner production to SMEs and promote policies for greening industry with the government at large. Regarding the management of waste from road construction, the MPWT can develop a waste management plan through conducting waste collection programmes and implement the policy on mitigating and eliminating land-based pollution caused by human activities. In addition to the above, the importance of waste management can be mainstreamed through education. Here, the MoEYS can further integrate environmental programmes into curriculum starting from primary school through university. Other ministries involved in the promotion of environmentally sound waste management can collect the good practices and the MoEYS can use them as demonstration projects in schools and universities.

Areas with rich biodiversity and unique environment can act as drivers for tourism growth. In Cambodia, the tourism sector has emerged as a major driver of economic growth and created jobs with 2,125,465 international visitors in 2008 exclusively, it is expected to increase in the next several years (MoT, 2008). Currently, MoT is planning to develop tourism projects along the Greater Mekong Sub-region (GMS) (4 projects) and Core Environmental Program (4 initiative projects). However, Cambodia meets a significant challenge in terms of insufficient infrastructure for tourism zones, limited proper waste management, sanitation, and insufficient standards of goods, souvenirs and services provision, and also the provision of electricity to some areas. MoT has developed a strategic action plan which can highlight options for creating environmentally sustainable solutions to the challenges mentioned above, creating incentives for eco-tourism development, including green-certification schemes for hotels, guesthouses and eco-lodges. Criteria for eco-tourism can include energy-efficiency, composting, waste-segregation, use of renewables such as biogas, use of locally produced organic rice and organic products, and other initiatives.

5) SUSTAINABILITY OF TRANSPORTATION

The transport sector plays a critical role in the economic development of Cambodia. The infrastructure and the linkage to neighboring countries facilitates to all people concerned in the capital and provinces including the remote area which would be necessary for a rapid development. Meanwhile, railways and maritime transport activities are minimal relative to their potential and must be developed. The following line ministries can cooperate and collaborate to encourage and enhance development of sustainable transport: Ministry of Public Works and Transport (MPWT); Ministry of Land Management, Urban Planning and Construction (MLMUPC); Ministry of Agriculture, Forestry, and Fisheries (MAFF); Ministry of Environment (MoE); Ministry of Industry, Mines and Energy (MIME); Ministry of Water Resources and Meteorology (MoWRAM); Ministry of Education, Youth, and Sports (MoEYS); Ministry of Commerce (MoC); Ministry of Health (MoH), Ministry of Economy and Finance (MEF); Ministry of Interior; Phnom Penh Municipality and Provincial Authorities; Ministry of Rural Development and Ministry of Tourism (MoT). In addition, waterways transport is essential to the mobility of the rural population, while air transport plays a significant role in the tourism industry.

Transportation in Cambodia faces several challenges including: increase of vehicles on the streets leading to traffic congestion; lack of affordable and convenient public transport options; violation of traffic rules; little or no control over the number of vehicles; high single occupancy and insufficient provision of facilities for pedestrians (sidewalks, traffic lights, etc.). However, some methods have been developed to cope with these challenges: further strengthen and effectively enforce the existing traffic law, promote public transit and improve and quality

and quantity of sidewalks (MPWT, MoI and Provincial and Municipal Authorities). In addition, regular control of vehicle engines can ensure the quality and function of the engines and to ensure energy efficient combustion (MoPTW, MoE, MoEF and MoC). The promotion of the use of public transit is required, and policies supporting PPPs within this sector could make it more attractive for the private sector to invest in public transit development. The promotion of vehicles that use gas or vegetable oil to minimize carbon emissions can be another focus area to be considered. Meanwhile, the government should continue to urge and strengthen the cooperation and collaboration between MPWT, MoE, Provincial and Municipal Authorities and MoH to prepare a sustainable transportation action plan focusing on reducing the environmental pollution in the cities resulting from traffic congestion, reducing traffic accidents and minimizing the CO, and CO₂ emissions into the atmosphere.

To improve transportation also in rural and forest areas, MAFF should improve and enhance the existing policy, action plan and strategy for sustainable forest management. To ensure that road development in forest areas does not result in accelerated loss of forests due to illegal logging. The cooperation and coordination between MPWT, MAFF, MLMUPC, and MoE is very important in order to identify appropriate land for roads to avoid negative effect on human settlements and agricultural lands. MAFF can further improve and enhance the existing policy, action plan and strategy for development of transportation to ensure synergies between sustainable forest management and sustainable transportation options in these areas. Public awareness campaigns for traffic safety are suggested along with better traffic engineering, transportation demand management, public transit systems, and education of youths and adolescents. The tourism sector is relevant for transportation as well, because visitors to Cambodia make much use of the existing transport options (MPWT, MoI and MoT). In fact, most tourists come and stay by using many kinds of local transports (ranging from bikes to cars, boats, cruise-ships, trains and planes). Even though MoT has justified to build roadside stations funded by the Japanese ASEAN Integration Fund (JAIF) under the Triangle Development cooperation scheme (Monduliri, Stung Treng, and Ratanakiri provinces)³ more roads should be renovated and constructed. Meanwhile, in tourism sites the recommendation should be included use of traditional ox and horse-carts, bicycles and/or other low-carbon means of transport to reduce air pollution and carbon emissions.

4.3 LONG-TERM INTERVENTIONS (10-20 YEARS)

The RGC is fully committed to some basic principles for taking the country towards development that meets the needs of the people. Focus includes: strict adherence to democracy in governance with openness and guaranteed freedom of expression; maintenance of political stability, rule of law, equity and social order; to be fully responsive, responsible, effective, transparent, accountable and predictable; and to ensure macro-economic stability, create and maintain key infrastructure, as well as a conducive climate for private sector to flourish, and provide essential social services for human capital formation and enhancement. However, further actions are in place for Cambodia in

³ These three provinces are located in the northeast of Cambodia bordering to Vietnam and Lao PDR.

response to the need for green development for economic growth. Therefore, RGC should focus long-term interest in energy efficiency improvements in its energy intensive sectors and investments in sustainable transport and renewable energy together with measures that promote environmentally sound agricultural productivity, sustainable freshwater management, and improvement of access to proper sanitation for the population.

Furthermore, integration of the green growth concept into the education system has to be encouraged; awareness raising and capacity building on green growth concept for workers will also be taken into account. Meanwhile, consideration will be given to mainstreaming gender equity into the green growth concept. In the long term, it is also recommended to substantially reduce perverse subsidies on, for instance, fossil fuels, and instead create positive incentives and appropriate taxes which will encourage a greener economy. Other reforms should be also considered to address some common issues in land use and urban policy to improve public access to and ownership of land. Sufficient effort must be mustered for long-term interventions, as they represent the possibility of creating a true opportunity to uplift the poor and vulnerable, restore the environment to its fullest potential and improve livelihoods of the people.

4.3.1 FISCAL INITIATIVES

In general, the overall plan for the development of the financial system is set out in the Financial Sector Development Strategy by MEF. This plan is comprehensive in nature and envisages a staged approach to financial sector development. To date, there has been much progress in the development of legal and regulatory frame works, however, there is still more to do to maintain steady and robust macro-economic growth, fiscal discipline, and vibrant financial sectors to pursue constant progress. Therefore, the RGC should take into account its subsidies to make sure that they do not have perverse consequences ensure that environmentally sound activities are. In this light, the RGC can operationalize the Polluter Pays Principle to promote the internalization of environmental costs. MEF should also continue to implement its Financial Sector Development Strategy to support the development of a sound market-based financial system to support resource mobilization, effective financial resource allocation, and broad based sustainable economic growth.

4.3.2 ECOLOGICAL AGRICULTURE

Ecological agriculture is productive and has the potential to meet food security needs. It is intended to allow farmers to improve their food production with low-cost, readily available technologies and inputs, without causing environmental damage. Ecological agriculture practices includes: integrated pest management, integrated nutrient management, conservation tillage, agro-forestry, water harvesting in dry land areas, windmills (water), drip irrigation, and livestock and aquaculture integration into farming systems. The effective practice not only increased yields, but also reduced adverse effects on the environment and contributed to important environmental goods and services (e.g., climate change mitigation) through increasing water use efficiency and carbon sequestration, and reduced pesticide use, to reach the greener growth⁴. The introduction of ecological agriculture concept to Cambodian farmers is very important. It can help farmers to improve food quality and increase the production of healthy food, while sustaining the environment.

⁴ <http://www.auroville.org/environment/agri.htm> and <http://www.twinside.org.sg/title2/susagri/susagri064.htm>

Agricultural sector is a politically sensitive sector affected by virtually the whole array of distortions, including— trade protectionism, perverse subsidies, wastage of water, unsustainable farming practices, and overuse of harmful chemicals. To reduce vulnerability of this sector, the RGC should encourage investment in sustainable and organic agriculture. Furthermore, the RGC should consider investment in freshwater systems to increase agricultural productivity and reduce water transmission losses/improve storage facilities of irrigation systems. The sustainability of agriculture is closely linked to the supply of water. Thus, the government should encourage its policy on the improvement of the irrigation systems through restoring the existing irrigation systems and building new ones to ensure the sufficient water for farmers.

The RGC should encourage a level playing field for sustainable agricultural production, including organic products, through increased investment in infrastructure for production of organic farming inputs, storage and transportation and possible start-up subsidies and/or soft loans. However, to be successfully implemented, the MAFF should enhance the cooperation with MoWRAM on Strategic Development Plans for Agriculture and Water Resources to ensure enough, safe and accessible food and water for sound and sustainable development of the agricultural sector. To this end, the RGC should put more focus on intensifying crop production to increase yields and rural incomes, diversification of crops, improving fisheries management, sustainable management of forestry through reforms, environmental conservation and implementation of land reforms, particularly to ensure land tenure for the poor. In addition, the government should prepare a comprehensive strategy for the agriculture sector; encourage and facilitate private sector involvement in agriculture and agro-processing; and cooperate with CoCC to enhance the pull from markets for organic agricultural products.

4.3.3 INFRASTRUCTURE AND TRADE IMPROVEMENT

Global concern about environmental issues is driving a dynamic market for environmental goods and services (EGS). The market covers many different sectors ranging from the natural resource based sectors to environmental technologies and services. Environmental industries are emerging in less and least developed countries of South and South-East Asia, including Cambodia. Some environmental technologies already exist in Cambodia at affordable prices. The use of such technologies is not yet widespread due to the lack of information and marketing know-how, underdeveloped green business linkages and inadequate public-private partnerships.

At the same time Cambodia could be considered as a target market for export of low-cost environmental technologies and services from industry leaders in the region. South-South trade could facilitate transfer of the whole range of environmental technology and related services and should be considered as an effective tool for a low carbon, sustainable development as well as a source of new “green” jobs and export revenues.

In order to further advance rural development, along with D & D, emphasis will be on building rural infrastructure roads, markets, drinking water facilities, sanitation facilities, minor irrigation, school and health service buildings, etc. much of it through devolution of funds through the commune councils - which may generate local employment and economic opportunities. Other physical infrastructures including building primary and secondary roads, railways, airports, ports, irrigation facilities, telecommunications, electricity generation and distribution networks should also be prioritized and encouraged. Therefore, MPWT should effectively continue to carry out its Strategies for the Environmental Sustainable Transport Development to ensure the economic growth and environmental sustainability including:

- The establishment of transport network in accordance with land use plans with the provision of access to the planned development areas and the establishment of road networks to promote desirable development in urbanized areas (MPWT, MoE, MAFF and MLMUPC);

- The introduction of modern public transportation system with the new system responsive to future traffic demand as well as economic development as capital city of the country and a system with affordable investment and manageable operation cost (MPWT, MEF, MoC, Mol, and MoE);
- The development of efficient, comfortable and safe transport system with purpose to alleviate traffic congestion on major roads and to establish the transport function (MPWT, Mol, and Municipal and Provincial Authorities);
- The improvement of urban and traffic environment to rehabilitate the national and provincial road pavement, particularly in urbanized area and introduce the public transport favorable to urban environment and tourism (MPWT, MoE, Mol, MoT, MLMUPC and MEF); and
- The establishment of efficient traffic control system with the provision of traffic signals in urbanized area to measure to reduce traffic accidents and alleviate traffic congestion and educate as well as enforce traffic safety through the enforcement of traffic law implementation (MPWT, MoYES, Mol, and Municipal and Provincial Authorities)

4.3.4 SUSTAINABLE ENERGY

Cambodia desperately needs energy to propel socio-economic development. The RGC has enhanced and promoted the country's energy security through investing in diverse technologies that offer the potential to reduce the nation's energy dependence on conventional fossil fuel as well as to minimize the impacts on environmental and human health. Thus, the RGC should further promote and encourage the introduction of renewable energy. Aside from that, the RGC should continue to develop a policy framework to embrace the rural electrification by renewable energy sources through:

- Striving to provide a reliable electricity service that is safe and results in minimum negative impacts on the environment at a cost acceptable to the rural communities;
- Offering legal framework, effective support through a variety of incentives, and fostering private sector participation to supply renewable energy electricity services (solar power, wind power, hydro power, tidal, and biogas/biomass) to the rural communities, with involvement of rural communities themselves to create added value such as employment generation and skills development;
- Acting as facilitator in the market by using a variety of encouragement apparatus conducive to electricity service that is equitable, reliable, and safe, with minimum negative impacts on the environment at an affordable price to the rural communities;
- Fostering the generation, transmission, and distribution of electricity with renewable energy technologies by setting electricity rates in accordance to the principle of Cambodia's electricity law;
- Promoting electricity systems that use the cheapest renewable energy system for rural communities; and developing a model in concurrence with the Government's duties related to grid extension and off grid extension; and
- Guaranteeing to provide sufficient funds, appropriate mechanisms, and training to allow participation in the rural electrification effort by financially disadvantaged people.

4.3.5 EDUCATION DEVELOPMENT

Capacity building and human resource development are among the main development strategies of the RGC. Currently, MoEYS is putting emphasis on education quality improvement at all levels, basic, post basic and higher education and the emphasis itself is also put on strengthening the partnership between the public and private sectors for more effective resource mobilization and utilization. However, MoEYS should ensure that all Cambodian children and youths have equal access to quality education regardless of social status, geography, ethnicity, religion, language, gender and physical form. Apart from that, attention needs also to be paid to other levels including on vocational training and higher education to start building a "critical mass" of educated, skilled, talented, capable people to serve the development needs of the country in various spheres (MLVT is the leading agency to implement this programme). Education has to meet international and regional standards to increase Cambodian competitiveness in global job markets.

4.3.6 HEALTH IMPROVEMENT

The key issue to improve the health sector would rely firstly on increasing the resources available (both financial and professional), secondly on strengthening service delivery including regulation and professional oversight. In addition, in addressing the quality of health care will require fundamental changes to incentive for health care professionals and to management systems of both private and public health care. It is noted that the health care sector has witnessed significant progress but some of the health indices are still quite low. In order to improve the health care sector, the following insights should be taken into account:

- Expand availability of health care facilities by construction and/or rehabilitation of hospitals, health centers, etc, in rural areas;
- Expand and strengthen sustainable methods for provision of help to the poor to access public health care system such as a flat-rate health insurance for the poor;
- Elicit, encourage and involve private sector in provision of health care, both in urban and rural areas; and
- Pay special attention to curtail spread of HIV/AIDS and other diseases especially to families, by information and education efforts.

4.3.7 INTEGRATING GENDER EQUITY INTO GREEN GROWTH

The mainstreaming of gender equity into the green growth initiative is of importance because gender equity is a critical issue to be addressed for improvement of developmental equity. Currently, gender equity is integrated into health, education, control over agricultural resources, socio-economic and political empowerment and legal protection. In addition, specific measures should be included in the collaboration between MWA with MoH for health, with MoEYS for education and MAFF, MoWRAM and MRD for agriculture and rural income generation for economic growth and create jobs.

4.3.8 LAND USE AND ECOLOGICALLY SOUND AND HEALTHY URBAN ENVIRONMENT

The appropriate management of available land is very important from both economic and environmental points of view. The RGC needs to look at changes in land use (ranging from forest to farming, or farm to urban and unclear property rights and legal enforcement). Meanwhile, the RGC should put more focus on the effective implementation of land law, sub-decrees and land strategies. In reality, the increasing urban growth such as rapid urbanization and growth of the cities contributes to the deterioration of environmental services. In this regard, ecological space within the provincial cities and Phnom Penh Municipality should be expanded and systematic management of the urban environment should be promoted (MoP, 2008). Furthermore, a management system for a sustainable urban environment has to be established by considering land use plans as a top priority. Development strategies have to be maintained and encouraged to promote access to clean water; build the physical infrastructures; develop environmentally sound landfill sites; promote public transport and promote tree planting together with the upgrading and expansion of parks and other recreation facilities.

In addition, an emission cap on air pollution should be introduced to major factories and industries to reduce the emissions of major pollutants such as dust, sulfur and nitrogen oxides, while the emission trading should be also introduced to those major businesses to drive voluntary efforts to reduce carbon emissions. Meanwhile, the RGC should consider the introduction of low pollution vehicles such as hybrid cars and natural gas cars/buses accompanied by the introduction of electric motorcycles and encourage the development of more energy-efficient, less polluting transport modes. In all such initiatives, the opportunity to stimulate local industries, employment and economic growth should be considered a significant priority. The RGC should also encourage and push the development of its master plan for environmental management to be conducted throughout the country for sustainable economic development. The introduction and implementation of ecological networks shall be considered to introduce many species from rural or suburban to urban areas, especially Phnom Penh Municipality. Furthermore, ecological networks can be used to describe and compare the structures of real ecosystems, while network models are used to investigate the effects of network structure.

4.3.9 GREENING THE ECONOMY

In the two groupings of environmental sectors there are a number of challenges facing exporters in Cambodia.

Sustainable natural resource products

SMEs, producer groups and community trading organizations in Cambodia face a number of challenges in exporting to environmental markets. These include lack of knowledge about production and marketing, high transaction costs in marketing, costs of compliance with quality standards and ensuring participation of the country in standard setting processes.

More specifically these include:

- Unsustainable and/or uncompetitive supply.
- Weak capacity to process and market products.
- High cost of compliance with quality standards.
- Weak national policies to support environmental sectors.
- Lack of developing country voice in international standard setting.

Environmental technologies and services

The environmental technology and services market face a similar set of challenges particularly relating to their difficulty in complying with international standards, other tariff and non-tariff barriers for example on documentation and labeling.

Cambodian exporters face typical barriers to trade in services according to the modes of delivery as defined by the GATS, for example equity restrictions for FDI, residency and citizenship requirements. These measures can significantly hamper the capacity of professionals from Cambodia to supply their services.

The Green Growth Roadmap will work to strategic objectives, namely,

- Strengthen the international competitiveness of Cambodian enterprises (micro level).
- Develop the capacity of trade services providers to support businesses (meso level).
- Support policy makers in integrating the business sector into the global Green economy (macro level).

The primary objective therefore of the Roadmap in trade development area is to strengthen the competitiveness of national SMEs exporting environmental goods and service from Cambodia.

The rapid increase in the volume and types of waste generated, including industrial waste, e-waste, and municipal waste, mainly owing to economic growth, industrialization and the limited waste management, represent a growing problem for both national as well as local governments. The increasing amount of wastes and the associated rise in the hazards that it poses are severely affecting the environment, natural resources, public health, local economy, and living conditions (UNEP, 2009). To encourage the right kind of development, the RGC can lobby for debt swapping schemes, where international debt is nullified in exchange of green development.

The RGC should encourage and facilitate the implementation of clean energy projects, invest in "smart" grids. It should continue to support the diffusion of small-scale off-grid technologies, especially those that create local employment and economic opportunities. The implementation of Cleaner Production technologies are of crucial importance, as also are new and creative ways of thinking about products and processes in terms of internalizing life-cycle assessments and material flows of products and services. The government should promote green industries and industrial ecology principles such as eco-industrial parks, using green technology and especially green energy to minimize negative effects to the environment, bio diversity and human health. The roadmap will work to strategic objectives such as: strengthening the international competitiveness of Cambodian enterprises, develop the capacity of trade services providers to support business and support policy makers in integrating the business sector into the global green economy. Meanwhile, the RGC should promote and integrate the policy on green industry into the national strategic development plan and encourage the enforcement and implementation of this policy. Effective environmental protection and natural resource management is a sectoral concern; many governmental actions to protect the environment and manage environmental impacts should be integrated with investment and policy priorities. There is also a need to incorporate sustainability impact assessments and compliance procedures in new project screening requirements. Therefore, the RGC should strengthen the capacity of MoE to plan and implement projects, including monitoring, enforcement, and strengthening of compliance according to the existing environmental legislation.

An incentive system of subsidies, taxes, and regulations that encourages environmentally responsible behaviour should be considered and promoted. Dealing with this issue, the RGC should also be encouraged to legislate towards internalizing the costs of externalities in this arena. This will help develop the waste management and recycling sector into highly profitable and labor intensive business sectors, providing reliable and competent services as well as decent conditions for workers. The sectors should cover safe and clean handling, transfer, storage, and disposal of waste and promote the 3Rs principle—reduce, re-use, and recycling. The effective implementation of 3Rs principle, there are four strategies shall be taken into account: reduce the volume of waste through establishing incineration plants;

reduce the volume of waste sent to incineration plants through recycling; cut down the volume of waste sent to the landfills; and finally, cut down the volume of waste generated through waste minimization. In considering public funding support to renewable energy technologies, green transport, and energy efficient buildings, the government should encourage the use of recycled materials and renewable energy. Furthermore, the government should give equal fiscal treatment to original and recycled/remanufactured materials and products. Moreover, the government should take into account the development of an integrated approach to transportation planning and financing, particularly at the urban level, with priority given to investment in energy efficiency and low carbon mobility that is also cost effective, e.g. rail, bus rapid transit systems, integrated public and non-motorized transport.

4.3.9 DECENTRALIZATION AND DECONCENTRATION REFORM

The strategic framework for Decentralization and Deconcentration (D&D) reform was developed by the RGC. It aims to achieve broad based and sustainable development and strengthen vibrant local economic foundation for every citizen to provide equal opportunities to participate in local development, effective natural resource management and delivery of quality public services to meet the needs of citizens and improve their livelihoods (MoI, 2005). The reform avails commune councils to plan and manage the construction of roads, the renovation of schools, and the establishment of sanitation infrastructures. In this function, the MoI has set its action plan to force the provincial and municipal authorities to crack down on land encroachment, forest clearance, illegal control, and pollution. Major strategies and reform programs include the Public Investment Program (PIP), which seeks to align the annual national budget to reach the targets articulated in the NSDP to seek to transfer increased responsibilities for economic development and poverty reduction. The Public Financial Management Reform Program can improve the linkage between policy priorities, budget planning and implementation, integrate accountability and review processes for both finance and performance as well as improve the payment and management of the civil service (MoI, 2005).

In this regard, the strategic framework for D&D is a very important factor for promoting and distributing the green growth to the provincial level. However, effective policy design and implementation requires careful consideration of the implementation environment at all levels of governance. The roles and responsibilities of central, provincial, district, commune, and village administrations are to deliver service to the populace; and give to the rights and roles to indigenous communities on forest management (DANIDA, 2006). Aside from that, the RGC D&D reforms underpin the foundations for democratic government, institutional reform and improved service delivery. Thus, the D&D reform can serve as a catalyst for the mainstreaming green growth for poverty reduction and sustainable livelihoods at sub-national levels. Therefore, well-functioning institutions and regulations are crucially needed for the attainment of green growth objectives and outputs.

V. IMPLEMENTATION MECHANISM FOR GREEN GROWTH

5.1 ENABLING ENVIRONMENT FOR THE NATIONAL ROADMAP

After stakeholder consultations with Line Ministries, the following suggestions have emerged. Firstly, the Green Growth Training of Trainers toolkits will be presented to Ministers in order to underline the importance of green growth and to increase buy-in on decision making levels. Awareness raising campaigns and capacity development at sub-national levels must be undertaken consistently and continuously to enhance understanding on issues pertaining to green growth. Finally, a green growth sub-decree should be created to ensure the underlying legal framework.

5.2 STAKEHOLDER COLLABORATION

The MoE and Line Ministries have a facilitating and implementing role for the green growth roadmap. The Green Growth Secretariat, while situated within the Ministry of Environment should therefore be in close cooperation with concerned ministries, depending on the nature of the cross-cutting issues to be dealt with in the Roadmap's projects. Also, to ensure necessary development in rural areas, the MoI can be involved in mainstreaming and overseeing the implementation of practices/projects at sub-national level, possibly by establishing Sub-national Green Growth Centers.

Moreover, other international donors/institutions also have a potential role to play, in the provisioning of financial assistance, once actual projects and activities have been proposed in the Roadmap (See Annex). Furthermore, the RGC should make more effort to introduce the green growth concept to donors to encourage stakeholder participation, collaboration, and cooperation. It is also important to identify stakeholders including: national and sub-national levels, scientific community, NGOs, and civil society organizations to create solid, broad-based support. Moreover, there is a need to disseminate information that can generate public support and to implement transparent processes for public involvement. Finally, it may also be required to monitor and evaluate the green growth management via stakeholder involvement to establish a clear target and quantitative goal of the green growth activities.

5.3 COORDINATING GREENING OF GROWTH BY USING THE ISA FRAMEWORK

Identifying what "green growth" means for Cambodian stakeholders requires a broader, longer-term, and more strategic process that emphasizes conceptual learning and transformative outcomes. Uncoordinated, ill-sequenced and disconnected sectoral policies will not succeed in spurring the greening of economic growth. It is therefore important that the Roadmap align itself with the aforementioned plans and priorities of the RS, the NSDP, and of the overall goals of the CMDGs. To ensure integration of the Roadmap with overall development planning, it is paramount that its aims is to harmonize with those put forth in the RS, the NSDP, and the challenges regarding the CMDGs. Foremost, the Roadmap aims to unite priorities for development and growth with those of environmental sustainability. This will positively contribute to the maintenance of macroeconomic stability, because the implementation of Green Growth tools and projects can help with the safeguarding of natural and human capital and thereby increase resilience against negative impacts from climate change and the global economy. Several interventions put forth in the Roadmap - including eco-village, sustainability of water resources and of forestry and renewable energy, have the potential to improve livelihood options of the rural poor by contributing to the diversification of incomes, the improvement of capacities and capabilities, the creation of new green job opportunities, as for instance through the cross sectoral promotion of organic agricultural practices, the introduction of biogas generation etc.

The focus areas of the RS are represented in the formulation of environmentally sustainable activities and interventions in the following manner: agricultural productivity can be promoted and maintained in the longer term if organic agricultural practices are promoted to hinder the degradation of arable lands. Sectoral diversification can be supported by increased capacity building, TVET, and other initiatives by MoLVT, and MoYES, etc. If organic farming is promoted in rural areas, and the production can be connected to the main markets, Cambodia can have the potential to become the organic rice hub of Southeast Asia. Such capital inflow would spur private sector growth, create additional employment opportunities, and as a whole benefit international marketability and competitiveness of Cambodian products. Generally, the Roadmap does not suggest other development aims than those stated in the RS, and the NSDP, but attempts to highlight the environmental and social aspects of these focus areas with practical tools

and interventions. Finally, the Roadmap applies the holistic green growth approach to these focus areas to address the challenges in a cross-sectoral manner towards improving access to essential services.

In any event, greening economic growth will require strong political ownership of the reform process and continuous cross-ministerial collaboration throughout all stages of the reform cycle. This is by no means an easy task. To assist in the facilitation of such efforts, the Inter-ministerial Green Growth Working Group has been created, whose main responsibility has been the process of formulating and overseeing the formulation of green growth projects, policies, and interventions. This Roadmap is a pioneering document to line out the initial possibilities for greening economic growth. Methods and Tools for Integrated Sustainability Assessment (MATISSE) Project, "Integrated Sustainability Assessment (ISA) is a cyclical, participatory process of scoping, envisioning, experimenting, and learning (see figure 1) through which a shared interpretation of sustainability for a specific context is developed and applied in an integrated manner in order to explore solutions to persist problems of unsustainable development."⁵ ISA can serve as a valuable instrument for governments and policy makers seeking to effectively undertake and coordinate Green Growth policies. The process underscores four major stages that are often continuous and overlapping.

5.3.1 SCOPING STAGE:

A key objective of this stage is to attempt to clearly identify, define, and understand any pressing problems that are contributing to un-sustainability, for instance, natural resource depletion, issues of persistent unemployment, and poor economic performance. Recognizing the root causes of these problems, such as incorrect price signals from perverse subsidies or weak command and control, is also important. At the same time, stakeholders must be identified and engaged, and a Roadmap to Green Growth that is based on country-specific problems and challenges must be framed and agreed upon. Collecting sound data on the problems and their impact on relevant stakeholders will be an important asset for the future when rallying for public support. After the ISA cycle has been completed, the problems and challenges must be revisited to make status about the progress, and stakeholders must again be identified to fit within a new context.

5.3.2 ENVISIONING STAGE:

Moving into this stage, It is necessary to be first involved envisioning among stakeholders what green growth and sustainability would mean in the specific Cambodian context. Identifying the vision of and challenges to sustainability and green growth will require the use of various participatory assessments. In line with the Sustainable Livelihoods Approach (SLA), as promoted by ESCAP, the concerns of vulnerable (including the poor) women and men should be included. Based on such agreement the envisioning stage entails designing the Roadmap with a long-term, holistic strategy to achieve green growth and sustainability. The options for gradually phasing-in a green tax and budget reform (GTBR), and other non-market-based instruments (e.g. eco-labeling), should be examined. This vision should contain multiple pathways including both a "business as usual" and green growth scenarios. Short-term policy proposals should strike a balance between cost-effectiveness, equity, and political feasibility.

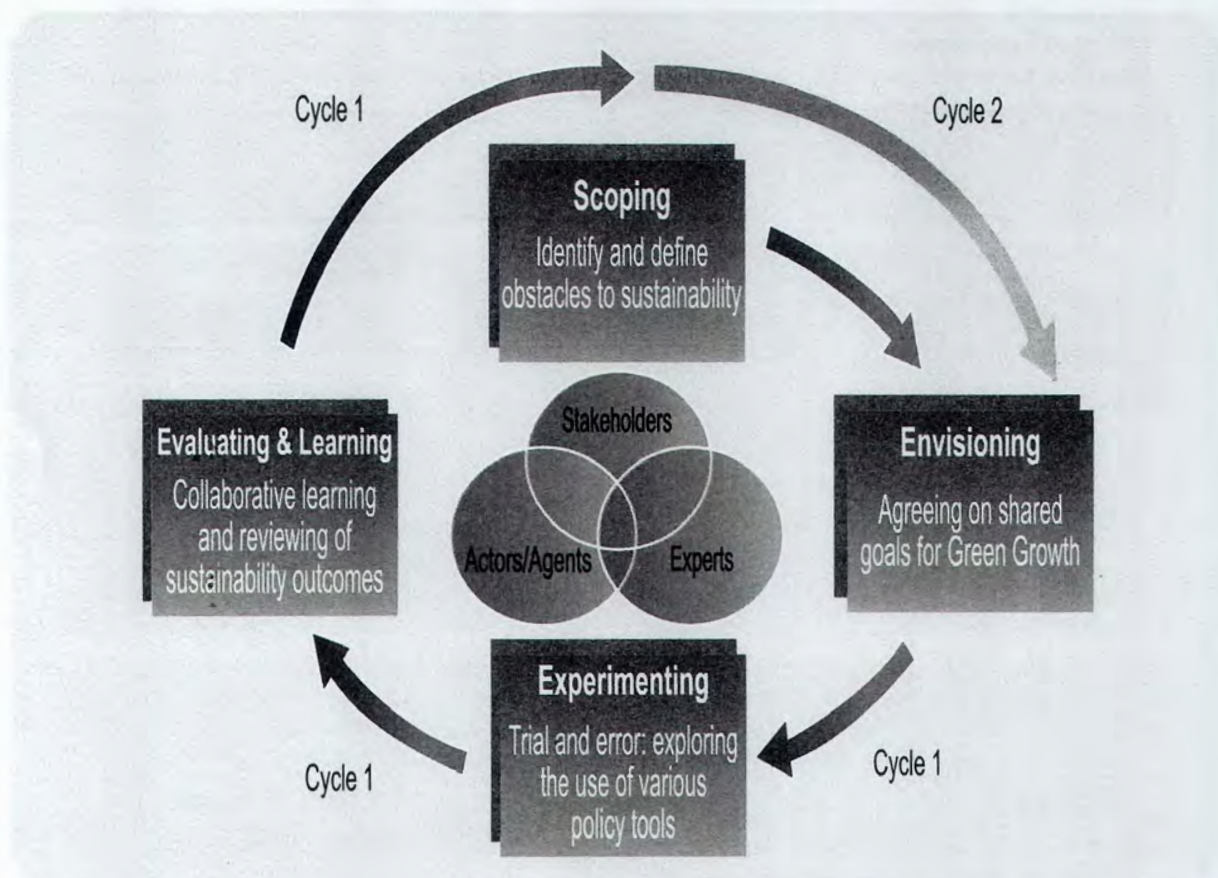
⁵ <http://www.matisse-project.net/projectcomm/index.php?id=833>

5.3.3 EXPERIMENTAL STAGE:

This stage focuses on utilizing ISA tools to analyze the feasibility, consistency, and adequacy of the vision of sustainability, in particular the drivers of various possible development paths. It is in this stage that policies are implemented to reach the goals set in the previous envisioning stage. Stakeholder input should be a criterion for determining which tools would be the most appropriate. Nonetheless, a combination of both qualitative processes and quantitative tools (e.g. models of systems and subsystems) would be ideal. The quantitative component is especially important for assessing eco-systems, as well as tax and subsidy burden on the poor.

5.3.4 LEARNING STAGE:

Formulating "lessons learned" from previous monitoring and evaluation activities is crucial for readjusting and fine-tuning the vision for green growth. These will feed into the first stage (scoping stage) of the next ISA cycle. It is also important to underline whether or not the policies achieved their intended goals and objectives in transitioning to sustainability. They may have caused unintended consequences that must now also be addressed. Widely presenting information on positive results of the first ISA cycle such as for instance improvements to environmental quality or the creation of a green job sector - is a method for maintaining long-term support for this process.



5.3.5 FUTURE IMPLEMENTATION FRAMEWORK OF THE GREEN GROWTH ROADMAP

The Policy, Planning and Implementation Framework (PPIF) could assist planning and scoping of projects and programmes, and track progress of proposed interventions on a web-based platform. The PPIF could be diagrammatic and visual to show links between policies, objectives and projects. This would demonstrate their interdependency and assist with identifying implementing agencies and prioritizing projects and programmes. Further, the framework would clarify the linkages to the National Strategic Development Plan 2006-2010 and 2009-2013, the Rectangular Strategy (RS), National Green Growth Roadmap, the 7 Accesses of the Roadmap and existing initiatives, and track progress and outcomes.

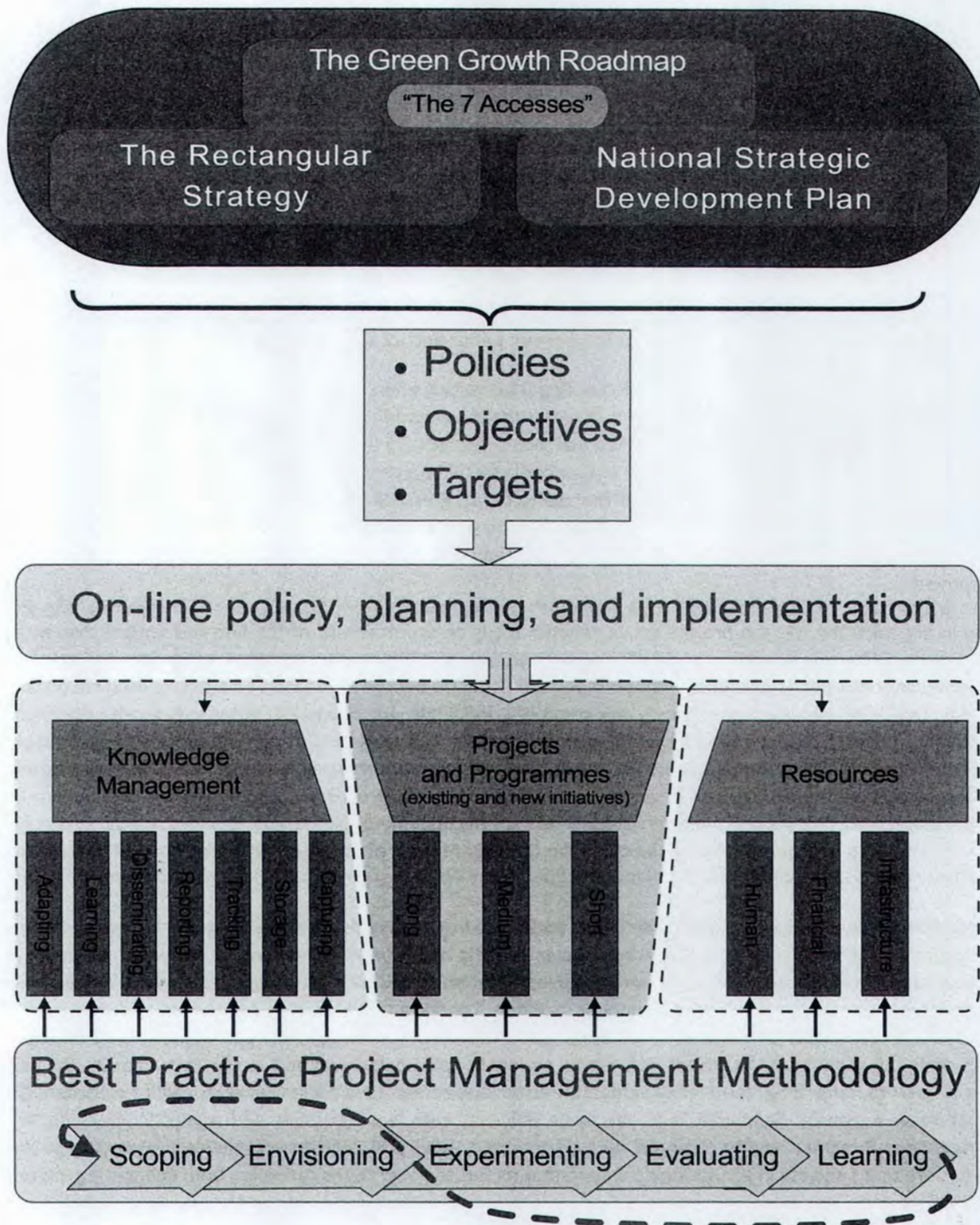
In addition, such implementation tracking could:

1. Enable any changes in policies or objectives to be assessed for impacts on projects (and vice versa for project outcomes).
2. Provide for project planning/management and outcomes to be tracked/stored as knowledge as per the ISA (Scoping Stage, Envisioning Stage: Experimental Stage: Learning Stage).

Ensure that short term and long term projects are correctly scoped and linked including links with existing projects and programmes to enable progress with long term objectives concurrently with short term priorities and momentum to be maintained.

3. Enable learning from around the world to be visible and adaptable where applicable.
4. Incorporate a project management framework to enable the best use of limited resources to ensure 'seed' objectives to be achieved.
5. Identify at the macro and micro level the resources needed (including human/financial), the progress of project and policy objectives and outcomes.

Policy, Planning and Implementation Framework



VI. CONCLUSION AND RECOMMENDATIONS:

The Green Growth Roadmap presented here has three broad objectives. In the short term (2-5 years), it will make a major contribution to stimulating the economy, saving and creating jobs, and protecting vulnerable groups and ensuring the environmental sustainability; while in the medium term (5-10 years), it will further promote sustainable and inclusive growth and the achievement of the CMDGs for economic development and social and environmental stability; and finally in the long-term (10-20 years), it will contribute to the reduction of Cambodia's carbon dependency and ecosystem degradation – all in favor of sustained economic growth and poverty reduction.

The RGC has adopted its NSDP (2006-2010) and its updated NSDP (2009-2013) 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. In addition, in late 2008, the new political platform of the RGC of the fourth legislature of the national assembly was unveiled with the aim to strengthen the quality of governance at all levels of government institutions in order to ensure that all public services are delivered in transparent, effective and accountable manner as well as to strengthen the rule of law, social justice and equity. This platform also includes a dedication to enhance management, preservation and sustainable exploitation of forestry and fisheries resources in accordance with the laws and regulations to protect the interest of the general public and local communities.

Meanwhile, the RGC is in the process of implementing D&D reforms that are overseen by the National Committee for the Management of the D&D reforms (NCDD) in which the development of Organic Law is important for the further transfer of functions and resources to sub-national levels. Moreover, the D&D coupled with economic growth and development will also increase the resilience of Cambodia to climate change and to other adverse impacts that are to be expected in the future. In order for these plans to progress smoothly, it is crucial to create an enabling environment for green investment to foster new green job growth. The government should actively involve private enterprises in greening the development sectors essential for Cambodia's long-term economic growth and development.

To stay in line with the RS, any project activity should focus on enforcement of the law and ensure that an overall enhancement of the progress towards development priorities. In addition, the roadmap emphasizes the cross-cutting nature of current and persistent development issues and applies a holistic approach and cross sectoral cooperation. In doing so, the RGC has the opportunity to positively influence its economic growth towards environmental sustainability, poverty reduction, and livelihood improvement. The government can influence the sustainability of development by ensuring adequate focus on the quality of human and natural resource pools. In realization of this broadly-based scope, the IGGWG can begin its journey towards green growth by designing more detailed work plans for initial projects as reflected in the interventions part of this document. Numerous activities and projects could be initiated in order to gain practical experience in the implementation of green growth projects and to gain support from donor agencies.

The RGC should actively involve private enterprises and NGOs in greening the development and mainstream the green growth initiatives through awareness raising; sector specific capacity development to increase eco-efficiency of production and consumption; and incremental implementation of ESCAP's proposed green growth policy tools to drive towards a sectoral greening of economic activity. Continued formulation of project and discussion with stakeholders at local levels is necessary to ensure project sustainability. Finally, the RGC should seriously consider the mainstreaming of green growth concept into overall national strategic development so that it can ensure the inclusive economic growth, and long term environmental sustainability for Cambodian society. National Green Growth Roadmap means growing Cambodia in a way to be efficient, with less resources and waste; to be clean, without polluting the environment; and to be green, with preserving greenery, waterways and the natural heritages. The RGC wants to develop its society in a sustainable way so that its future generations can enjoy both economic growth and a good living environment.

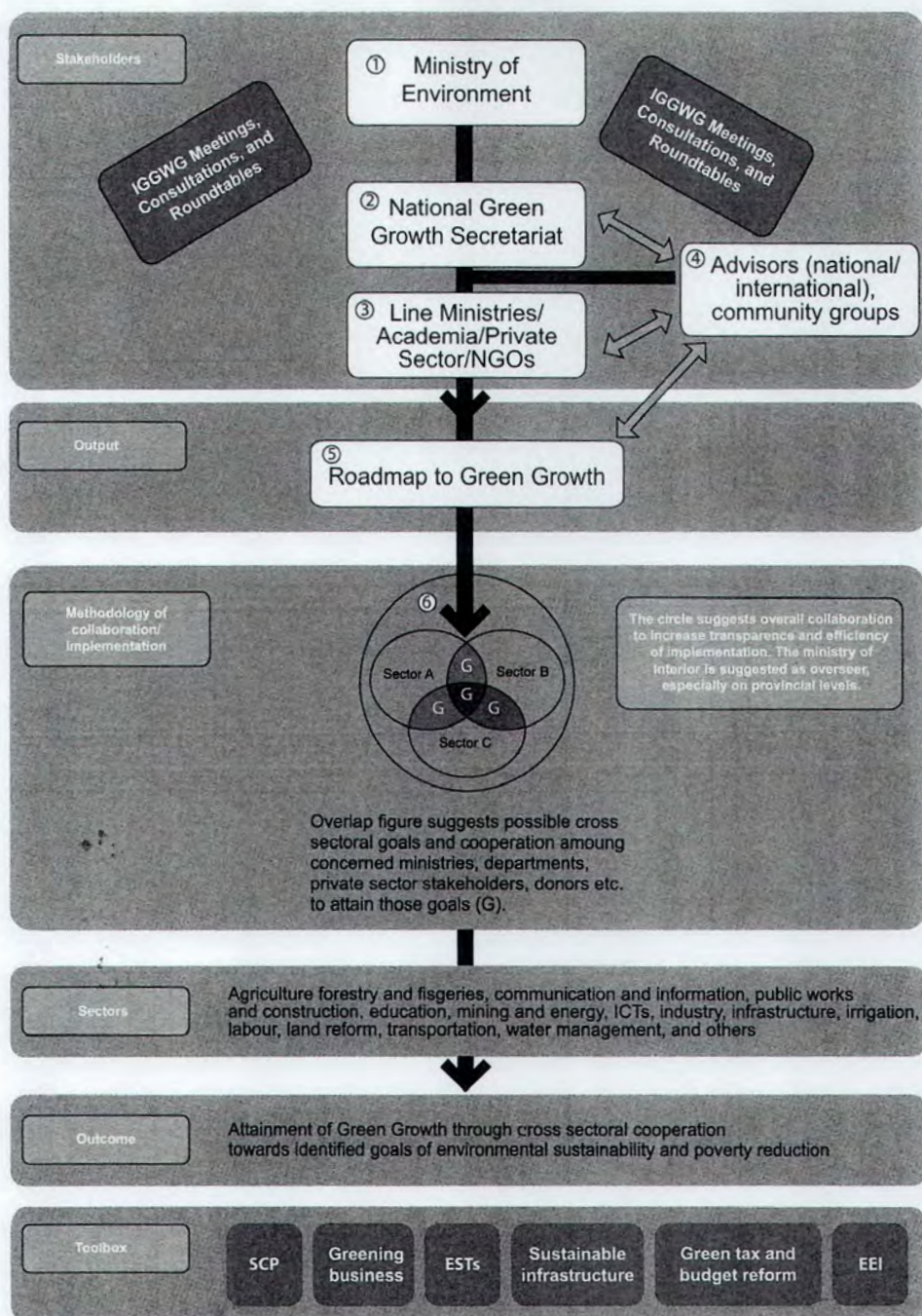
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Annex 1:

Stakeholder Involvement Organigramme - Formulation and Implementation of the Roadmap



Annex 2: LIST OF PRIORITY PROJECTS

The prioritization of Cambodia's project profiles for green growth will be validated through a series of workshops and training courses. The aim of the prioritization of the proposed green growth project activities is to select the most crucial projects for affordable funding under circumstances where financial resources for project implementation are limited to those that support Cambodia's sustainable development objectives. The criteria of the projects will be defined based on the existing RGC's development priorities as articulated in the Rectangular Strategy for growth, employment, equity and efficiency, the CMDGs and other of Cambodia's existing laws, regulations, policies, statements and commitments to international conventions. The criteria encompass various aspects for economic development with environmental sustainability. Those proposed projects are listed below:

List of Proposed Projects

No.	Project's name	Short-term (2-5 years)	Medium-term (5-10 years)	Long-term (10-20 years)	Estimated budget (USA)	Responsible Ministries	Stakeholders
1	Create a National Ministerial Green Growth Council	✓				MoE	
2	Capacity building and awareness raising on green growth to the officers, private sectors, academia and local communities	✓				MoE	
3	Create a national public awareness and consultation process, amongst others by disseminating "Greening Workplace" and "Greening Home" educational materials and information posters	✓				MoE	

4	Bringing environmental technology to the poor to facilitate access to and enhance national export capacities in environmental technologies (photovoltaic, energy efficiency etc.) (Phnom Penh, dependent on donors from private sector)	✓							MoE	MIME, Private Sector, NGOs, MoI and MoT
5	Develop national strategy for Greening industries: based on resource efficiency and 3R (reduce, reuse and recycle) strategies	✓	✓		✓				MoE	MIME, Private Sector and NGOs
6	Develop stimulus measures for promotion of sustainable agriculture including index-based insurance schemes and/or micro-financing	✓	✓		✓				MoE	MAFF, MoC and MEF
7	Develop a scheme for innovative investments to ensure sustainable natural resource management	✓	✓		✓				MoP	MEF and MoC
8	Develop Eco-Village for sustainable economic growth and environmental sustainability		✓		✓				MoE	MAFF, MIME, CCoC, MLMUPC, MRD, MoI, MoWA, MoEYS, MLVT, MRCs, MoH, MEF, and MoT

9	Sustainability of Water Resource for consumption and irrigation			✓	✓				MWRAM	MAFF, MRD, MIME, MoE, MLMUPC, MoWA, Mol, MoEYS; and MoT
10	Develop sustainability of agriculture strategy plan and promotion of the use of non chemical fertilizer			✓	✓				MAFF	MoWRAM, MoE, MIME, MLMUPC, MRD, MoWA, Mol, MoH, MoC, MEF, CCoC, and MoT
11	Development and implementation of sustainability of Forests management			✓	✓				MAFF	MoWRAM), MoE, MIME, MLMUPC, MRD, MoWA, Mol, MoH, MoC, MEF, CCoC, MoT and Local Authorities
12	Develop national strategy plan for sustainability of energy use			✓	✓				MIME	MAFF, MoWRAM, MoE, MIME, MLMUPC, MRD, MoWA, Mol, MoH, MoC, MEF, CCoC, and MoT
13	Develop and effective implementation of sustainability of waste management in country			✓	✓				MoE	MAFF, MIME, Mol, Phnom Penh Municipality, and Local authorities

14	Sustainability of transportation and infrastructure development			✓	✓				MPWT	MoE, MAFF, MIME, MoWRAM, MPWT, MoC, MEF, MoH, MoP, MoEYS, Phnom Penh Municipality, MoWA, and MoT
15	Development and implementation of the role of Gender on green growth			✓	✓				MoWA	NGOs, Stakeholders
16	Health sector improvement for enhancing green growth implementation			✓	✓				MoH	NGOs, Stakeholders
17	Participatory sustainable land use management and enhancing the effective land use planning for indigenous people			✓	✓				MLMUPC	MAFF, MoI and MRD and Stakeholders
18	Sustainable Coastal Zone development and Management and sea ecosystem research and development for green growth			✓	✓				MoE	MoI, MAFF MLMUPC and Local Authorities
19	Improve and implement the scientific and technology for National Adaptation Plan of Action to Climate Change to ensure sustainable development	✓		✓	✓				MoE	MIME, MoWRAM, MAFF, Academia, NGOs, Private Sector and Local Authorities

20	Improvement and effective implementation of Waste Water Management		✓	✓				Phnom Penh Municipality, MIME, and Local Authorities
21	Land use and ecologically sound and healthy urban environment and introduce the eco-city concept for sustainable city development		✓	✓				MoE and Phnom Penh Municipality and Local Authorities
22	Assess climate change intensity and develop climate change and sea level rise scenario		✓	✓				MoE, MoWRAM, MAFF, Local Authorities, NGOs and Key Stakeholders
23	Safe water supply and sanitation for rural communities and alternative livelihood development		✓	✓				MoWRAM, MIME, MAFF, and MoE
24	Develop/integrated school extra-curricular programme on green growth		✓	✓				Stakeholders
25	Development of small and medium enterprise industries for sustainable economic development		✓	✓				CCoC and MoC, Private Sector and Stakeholders

32	Reducing Emission from Deforestation and Forest Degradation (REDD)		✓	✓					MAFF and MoE	Private Sector, NGOs
33	Research and develop climate change vulnerability and response programme		✓	✓					MoE	MAFF, MIME, MoWRAM, and Academia
34	Produce and disseminate all educating material information, and directive articles booklets on green growth to all stakeholders		✓	✓					MoE	Stakeholders from line ministries and NGOs
35	Develop strategy and action plan to encourage the use of renewable energy for sustainable energy consumption		✓	✓					MIME	MoE and Private Sector
36	Development of national strategy plan to ensure sustainable natural resource management in protected areas		✓	✓					MoE	MoI and Local Authorities
37	Introduction the environmental technology to the poor		✓	✓					MIME	MoE and Stakeholders and Private Sector

38	Implement Afforestation and Reforestation for Clean Development Mechanism project to ensure forest cover to mitigate climate change	✓	✓	✓	✓	MoE, Climate Change Department and MAFF, Forestry Administration	Local Authorities/NGOs, Academia, and Private Sector
39	The development of national strategy and action plan on environmental education for sustainable development (to be responsible by MOE		✓		✓	MoE	Collaboration with MOEYS and other stakeholders
40	The establishment of national committee for implementing environmental education for sustainable development		✓		✓	MoE	Council of Ministers