



KINGDOM OF CAMBODIA

Nation, Religion, King

**Climate Change Strategic Plan
For Education**



MINISTRY OF EDUCATION, YOUTH AND SPORT

2013

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PREFACE

Education is regarded by each country in the world as an important field in ensuring the development of human resources to meet national needs. Societies and nations need continuous human resource development. In this regard, the Royal Government of Cambodia (RGC) has integrated education into the socio-economic development plan by 2015. Under the Rectangular Strategy, RGC considers that “Education is a priority” in terms of national development. Improvement of quality and efficiency of education is at the core of the efforts to develop this sector.

Currently, climate change is one of the greatest social, economic and environmental challenges facing the globe. Climate change affects people across the world. Likewise, climate change is likely to affect the effectiveness of the Cambodian education sector as Cambodia is vulnerable to impacts of climate change. In response, the Ministry of Education Youth and Sport has developed a Climate Change Strategic Plan for Education (CCSPE) to provide knowledge and skills to students in adapting to climate change for sustainable development, in coping with extreme weather events and threats to rural livelihoods, especially rural-urban migrations.

In this regard, the Ministry of Education Youth and Sport has developed a curriculum for climate change education to support the CCSPE. The Climate Change Strategic Plan for Education is a core document that provides guidance in development of school curricula and in mainstreaming topics on climate change into national curricula.

The Climate Change Strategic Plan for Education is expected to be a useful resource for teachers, school directors, educational officers, parents, scientists, researchers and other stakeholders. To ensure effective implementation, the Ministry of Education Youth and Sport looks forward to close cooperation with all educational institutions, local communities, Non-Governmental Organizations (NGOs), International Organizations (IOs) and other stakeholders.



Phnom Penh

21, Feb. 2013

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ACKNOWLEDGEMENTS

First of all, the Development Team would like to extend its deep gratitude to **His Excellency IM SETHY, Minister** of Education, Youth and Sport, for his wise guidance and strong support for development of the Climate Change Strategic Plan for Education (CCSPE).

Sincere thanks also go to **His Excellency HAK SENG LY, Under-Secretary of State** of the Ministry of Education Youth and Sport for his support and contribution to the realization of this CCSPE.

The Team also wishes to thank Development Partners for their collaboration and support for in the process of development of the Strategic Plan. The team also acknowledges and thanks all coordinators and facilitators from the Ministry of Environment for their invaluable contribution and guidance.

Last, but not least, the Team would like to express its thanks to all key participants from all MoEYS technical departments for providing key ideas and perspectives during the consultative meetings, which have contributed to development of this Strategic Plan. Without their invaluable contribution, the Team would have faced difficulties in this assignment. Thanks are also extended to all field workers for sparing their valuable time to assist the Team in collecting information.

ACRONYMS AND ABBREVIATIONS

MoEYS	Ministry of Education Youth and Sport
DCD	Department of Curriculum Development
CCE	Climate Change Education
EFA	Education for All
POE	Provincial Office Education
DOE	District Office Education
LSP	Life Skills Program
DP	Development Partners
TD	Technical Developments
MoEF	Ministry of Economy and Finance
GDP	Gross Domestic Products
ELSP	Environmental Life Skills Program

EXECUTIVE SUMMARY

Climate change may affect the education sector directly through increased frequency and/ or severity of extreme weather events, and perhaps even more so through a range of socio-economic impacts. Extreme weather events may lead to damages of educational and other key infrastructure that is necessary for the functioning of the education sector, resulting in temporary or more lasting disruption in the provision of educational services.

More indirectly but perhaps even more significantly, a series of socio-economic impacts of climate change may reduce educational achievements and the performance of the education system. Some impacts may lead to increased school dropout rates or an increase in the number of days in which children and teachers do not attend school. For instance, children may be required to spend more time fetching increasingly scarce water and fuel wood, or to assist in agricultural work or to seek other work under conditions of reduced agricultural production / increased precariousness of livelihoods. The increased prevalence of malnutrition, which is known to impair concentration and learning capacity, and if suffered over long periods during childhood, to impair mental development, may adversely impact children's performance at school. The increased morbidity caused by changes in water availability and quality changes in the seasonality and range of disease vectors, etc. may both reduce school attendance by pupils and teachers and adversely impact children's and students' learning performance.

Climate change may create conditions of insecurity in which the provision of educational services and/or school attendance become difficult or impossible. Finally, as a result of conflicts as well as the increase in the frequency and/or intensity of extreme weather events and threats to rural livelihoods, climate change may increase rates of migration, especially rural-urban migrations. The resulting population increases in urban areas and in particular urban slums may put unbearable stress on already insufficient public educational infrastructure and human resources.

Adapting to climate change

Most of the effects of climate change that act as threats to the education sector have to be addressed through actions in other sectors (e.g. health, water, agriculture, public infrastructure), so integrating climate change aspects in education involves providing inputs for other sectors' adaptation strategies. At the same time, some adaptation measures can also be adopted within the education sector itself:

- As far as infrastructure is concerned, possible measures include making educational infrastructure as "climate-resilient" as possible and, where power shortages are expected to become more frequent and electricity is essential to operations, investigating possibilities of reducing dependence on externally supplied energy;
- As far as school attendance and learning performance are concerned, possible measures under the control of education authorities include organizing the provision of free school meals, developing basic medical surveillance and referral program in schools, and raising awareness of disease prevention and detection amongst schoolchildren and teachers;

Contributing to climate change mitigation

The education sector is definitely not a big contributor to emissions; accordingly, the sector's potential for contributing to climate change mitigation is rather limited. Some limited mitigation options nevertheless exist, for instance:

- Improving the energy efficiency of education facilities;
- Gradually opting for local power supply based on renewable energies to cover part of the energy needs of education facilities (which also ensures a minimum level of power availability during power cuts) and,
- Where traffic to schools and other education facilities relies significantly on individual motor vehicles, developing public or collective transport and encouraging non- motorized means of transport.

Enabling response capacities for both adaptation and mitigation

The effects of climate change on a country can be diverse and adversely impact practically all sectors of activity. These expected effects will require a whole range of measures to adapt to the new conditions and contribute to the global mitigation effort without compromising development. The ability of partner countries to identify and then implement adaptation and mitigation strategies can be supported through awareness raising and capacity building actions in the education sector. For instance:

- Awareness-raising on climate change and its expected effects can be integrated in school curricula at the different levels of education;
- Vocational training could be supported to generate in-country capacities necessary to implement national adaptation and mitigation plans or strategies;
- Post-graduate studies on climate change adaptation and mitigation could be developed; this would allow the creation of a pool of in-country expertise that would then be able to lead on the development of adaptation and mitigation strategies in a variety of sectors; such studies could also support the development of expertise for climate-related negotiations in international forums, and for making the best use of financing mechanisms available under the Kyoto protocol and its successor.

1. INTRODUCTION

The Intergovernmental Panel on Climate Change (IPCC) predicts that global temperatures will rise between 1.8°C and 4.0°C by the last decade of the 21st Century. The impacts of global warming on the climate change, however, will vary in different regions of the world (MoEF, 2008).

Our planet is very close to reaching a tipping point where climate change and global warming will become irreversible. Many scientists believe that this decade may be our last chance to do something effective against climate change. The tipping point represents a global temperature increase of two degrees Celsius. This increase in global temperature will among other things, lead to melting of polar ice sheets and massive loss of rainforests. What one country quickly needs is new international climate deal but this doesn't look to be happening any time soon because there are still major differences between developed and developing world in proposed decrease. Rainforests are becoming drier and oceans are becoming increasingly acidic, all because of the increased climate change impact. Extreme weather events such as hurricanes are becoming more frequent and there is also a danger of new diseases (Tailor and Francis, 2009).

The only solution to climate change issue is to significantly reduce greenhouse gas emissions and this can only be done by shutting down fossil fuel fired power plants and switching to clean, renewable energy sources. On the other hand, the newer developing countries such as Cambodia should address its national strategic plan on possible mitigation, adaptation, and resilient to climate change in the level it could. Therefore, every single field of activities, project, and program of institution must take the climate change perspective into strong consideration in their work plan (John, 2010).

Based on Government Rectangular Strategy in Rectangle IV: Capacity Building and Human Resources Development, Side 1: Strengthening the Quality of Education, and Rectangular Strategy in Rectangle I: Enhancement of the Agricultural Productivity and Diversification, Side 2: Land Reform and De-mining. National Green Grow Roadmap Master Plan (2010). Reducing Disaster Risk document (2010). Administering on Disaster Risk document (2011). Climate Change and Cleaning Development document (2010). Data base on disperse and placing of pollution element document (2009). Secondary memorandum document of climate change searching (2011). Holt Science and Technology Earth-Science document (2001). Prentice Hall Earth-Science document (2005). The Ministry of Education Youth and Sport included climate change education (CCE) into the National Curriculum by integrated environmental education in the primary and secondary text book, and Cambodian higher education focuses on the two main themes:

- To improve the quality of education of the students and communities by educating on climate change impact, disaster risk, adaptation and resilience to climate change, encouraging teachers, students and communities involve with CCE activity, protecting deforestation, air pollution and water resource and an active social awareness, rather than these people always relying on central government or aid agencies to help them out. In fact, encouraging and achieving a more independent attitude to solving some of their own problems lead to getting personal satisfaction from making progress themselves.

- To encourage and assist the teacher, student and community to participate more directly in improving environment education (CCE). The successful development of these aims would make a significant contribution by strengthening the knowledge on environment education (CCE).

The MoEYS is organized into six directorates: Directorate General of Administration and Finance, Directorate General of Education, Directorate General of Higher Education, Directorate General of Sport, Directorate General of Youth, Inspectorate General and Secretariat General of Education for All.

A series of policies and curriculum have emerged as current mandates of the MoEYS, such as the policy of curriculum development, life skill policy, teacher development policy, ICT policy, and national curriculum. These policies and national curriculum are being implemented through the projects and programs of:

- Disaster risk education and adaptation to climate change project,
- Health educational program,
- Environmental teacher training program,
- Monitoring and evaluation program, and
- Teaching and learning program.

Fields of activities in the sector of CCE development will need to interface with the full perspectives of the climate change mitigation planning process, the adaptation planning process and the **resilience design to climate change impacts**. Therefore, projects and programs of the MoEYS will specify the climate change mitigation, adaptation and resilience in their planning activities as a priority. This Climate Change Strategic Plan for Education describes the strategic activities planned for the current further mandate of the MoEY in the link with climate change actions and perspectives in all CCE development. These activities for improving the livelihoods of student and community must be carried out in the right way and in the correct social, economic and environmental contexts.

2. SECTOR-RELATED PROFILES

The Mekong River and its tributaries dominate Cambodia's hydrology. Cambodia covers an area of 181,035 km² extending approximately 580 km east to west and 450 km from north to south. Cambodia's topography broadly consists of the low lying central plains surrounded by mountainous and highland regions, and a 435 km coastline to the south. The Tonlesap Lake, an outlet of the Mekong during the rainy season, covers an area of up to 10,400 km² in the northwest. Cambodia's tropical monsoon climate is characterized by a rainy season (May-October) accounting for 90 % of annual precipitation and a dry season (November-April). The average annual rainfall is about 1407 mm. However, over the past decade, some inland provinces have experienced less than 600 mm of rainfall annually, while precipitation has reached 3,800 mm in coastal areas.

The Cambodian population is predominantly rural. The population of Cambodia increased from 5.7 million in 1962 to 11.4 million in 1998, and to 13.4 million in 2008. More than 51 percent of the population is female (6.9 million) and about 80 percent of people living in rural areas (1,621 communes and 14,073 villages). Phnom Penh and other urban areas account respectively for 10 percent and 9.5 percent of the population. The sex ratio (number of males per 100 females) was very low (86) in 1980 due to male casualties during the Khmer Rouge years but it gradually improved to 94.2 in 2008. Approximately 52 percent of the population lives in the central plain, 30 percent around Lake Tonle Sap, 11 percent in the highland and mountainous areas, and 7 percent in coastal areas. The national average population density is low for the region at 75 people per km².

Cambodia's GDP is strongly influenced by the climate. Because of a high reliance on agriculture and fisheries, extreme events such as flood and drought have significant adverse impact on Gross Domestic Products (GDP). Annual GDP growth rate from 2000 to 2009 fluctuated widely from 5 to 13% (2005). In 2008, GDP grew by 6.5% with agriculture, fisheries and forestry accounting for 32.4 percent of GDP, industry for 22.3 percent and services for 38.8 percent. The contribution of industry to GDP has doubled since 1993, but a substantial proportion of population is dependent on the farming and fisheries sector.

Economic opportunities and challenge vary greatly across Cambodia. Development trends reveal a high degree of spatial heterogeneity, calling for a local approach to development and flexible policies, tailored to the characteristics of different places. In particular, progress in the achievement of the Millennium Development Goals varies greatly across different provinces and between rural and urban areas. Diversity and complexity are further exacerbated within provinces at district and commune levels. This suggests the need for a strong focus on understanding and tackling local development dynamics.

The Ministry of Education, Youth and Sport is a multi-disciplinary intervention institution. It works in the areas of ensuring that all Cambodian children and youth have equal opportunity to access quality education consistent with the Constitution and the Government's commitment to the United Nations Convention on the Rights of the Child, regardless of social status, geography, ethnicity, religion, language, gender, or disabilities. The main activities of the MoEYS related to the CCE are curriculum development, environment and health education, pre-service and in-service teacher training, educational document development, CCE dissemination to community.

2.1 Curriculum Development

The MoEYS has overall responsibility for the strategy and implementation of curriculum development with the Department of Curriculum Development (DCD) being the technical agency. The intended users of the strategy are relevant institutions at all levels, including national institutions, provincial education offices (POEs), district education offices (DOEs), and schools.

With regard to curriculum development, there is an urgent need to review the curriculum for completing the goal of EFA by 2015, including the environment and health education, life skills program, vocational education.

Responding to this basic need, a MoEYS working group— under the full coordination of the DCD and relevant departments— has developed the national curriculum on environment and health education, life skills program, and vocational education. The national curriculum has identified measures including: strengthening of institutions; determining responsibilities of relevant agencies – both at national and sub-national levels; enhancement of participation of communities that are beneficiaries of improved environment and health education, life skills program, and vocational education; strengthening service quality; involvement of the private sector; and, encouraging local communities to become owners after the program or project completion. The sector aligns with the principle of Decentralization and De-concentration (D&D). In accordance with the D&D principle, the sector operates at a number of different levels: household and community, commune, district, provincial and national. At each of these levels, there are several different actors, stakeholders and individuals, each of whom has different views and ideas. All of these factors add up to a complex sector in terms of shared values, understanding the challenges, systems and procedures, and the means to address the overall challenge of enabling student, teacher, youth, and out of school children to have sustainable access to be awareness of CCE.

2.2 Environment and health education

The main objectives of environment and health education are:

- to foster clear awareness of, and concern about, economic, social, political and ecological interdependence in urban and rural areas;
- to provide every person with opportunities to acquire the knowledge, values, attitudes, commitment and skills need to protect and improve the environment; and
- to create new patterns of behavior of individuals, groups and society as a whole towards the environment.

Responding to the main objectives of environment and health education, MoEY proposes the following strategies:

1. Determine whether an environmental protection plan has been developed as part of emergency response by consultation with relevant government ministries.
2. Identify people within MoEYS who are (or will be) responsible for environmental education and ensure that they receive necessary training.
3. Assess environmental education needs and develop skill-based environmental education curricula/programs based on the assessment.
4. Identify modifications required in the current curriculum to ensure inclusion of the environmental education component.
5. Facilitate the development or improvement of materials and methodologies for environmental education, and the testing and implementation of these programs.

6. Provide guidance to educational authorities in emergency-affected areas and to civil society organizations on the conduct of environmental education programs.
7. Provide resources and train teacher for environmental education.

2.3 Life skills program

The Life Skills Program in the mainstreaming of programs addresses various issues such as general life skills, pre-vocational life skills, normally life skills and vocational life skills.

These issues and environment problem still continue in the world as well as in Cambodia, so education for the Life Skills Program (LSP) need to provide one platform to enrich the CCE, as we move toward a sustainable development.

The Environmental Life Skills Program consists of stand-alone modules that focus on five fundamental environmental issues: *Biodiversity Conservation, Climate Change and Sustainable Lifestyle, Energy Efficiency and Conservation, and Renewable Energy, Waste Management, Water Conservation*. Each module is designed for a particular audience or school level based on the science subject curriculum. The details of each module are as follows:

- **Biodiversity and Conservation** – this module focuses on the interrelationships of various components in the environment.
- **Climate Change and Sustainable Lifestyle** – this module focuses on the concepts of climate change and prepares the school to adapt to its impacts.
- **Energy Efficiency and Conservation & Renewable Energy** – this module focuses on the benefits of conserving energy and making energy efficient choices.

The different renewable energy sources will also be discussed.

- **Waste Management** – this module focuses on waste management by understanding the 3Rs (reduce, reuse, recycle) and composting.
- **Water Conservation** – this module focuses on the watershed - the source of water - and understands its importance.

The LSP is envisioned as a three-year program that aims to increase awareness and motivate young people to more actively participate in conserving and protecting the Cambodia's environment.

2.4 Vocational education

The long-term vision of the Ministry of Education, Youth and Sport (MoEYS) is to “establish and develop human resources of highest quality and ethics in order to develop a knowledge-based society within Cambodia”.

In alignment with its Education Strategic Plan 2009-2013, MoEYS is introducing various initiatives to make better use of information and communication technologies (ICT) and tourism in order to

achieve this vision, to improve the effectiveness of education at all levels, and to produce a workforce for the country both technologically productive and able to think critically.

Environmental awareness is the main principle for our future green education. This section covers initiatives, publications or other activities aimed to raise awareness on issues related to climate change and its impacts. It also includes topics related to capacity building on the various aspects of climate change.

- 1- To enhance awareness among the General and Technical High School (GTHS) and institutions about the new challenges related to:
 - a- Environmental issues and Climate Change that affect farming;
 - b- Changes in farms and firms and the relationship school-enterprise;
 - c- GTHS and the application in green (agricultural) sector and to know the innovative projects and initiatives carried out in Cambodia that could permit them to face these challenges trying that the schools implement some of these projects/initiatives.
- 2- To improve knowledge, skills and competences of teachers and managers of GTHS and other stakeholders of the trade about the challenges indicated above.
- 3- To encourage innovative thinking and entrepreneurial behavior of students.
- 4- To strengthen the cooperation among the partners.

3. CLIMATE IMPACTS AND CLIMATE RISK PROFILES

Cambodia is one of the most climate vulnerable countries in the world and will become even more so as a result of further climate change. Floods, tropical storm surges, droughts and disease epidemics are likely to become more frequent and severe in the coming years. These changes will threaten the significant achievements that Cambodia has made over the last 10 years under the strong Third and Fourth parliamentary mandate of the Royal Government of Cambodia in increasing incomes and reducing poverty, and will also make it more difficult to achieve the Cambodian Millennium Development Goals. Over the last 10 years, the Government of Cambodia, with the support of development partners, has invested large funds to make the country less vulnerable to natural disasters. These investments include flood management schemes (flood control), awareness raising, storm and flood shelters (Ketsana, 2011) and the construction of rural roads, dams, and reservoir's dykes above flood levels. Climate resilient varieties of rice and other crops have also been developed. The challenge Cambodia now faces is to scale up these investments to create a suitable environment for the economic and social development of the country and to secure the well-being of our people, especially students.

With its forward-thinking, the MoEYS's vision is, therefore, to eradicate poverty and to achieve the knowledge well-being for all the people, especially students. This will be achieved through a pro-poor **climate change strategy by sector**, which prioritizes adaptation and disaster risk reduction, and also addresses climate change awareness development, mitigation, technology transfer. However, there is a need to clearly know to what extent the climate change impacts have been experienced by the education sector. These can be addressed as follows:

3.1 Climate Change and the Curriculum Development

Since 1996, The MoEYS has developed the National Curriculum for running education programs in primary, secondary, and higher education levels. But, at that time the curriculum integrated the concept of environmental science only, i.e., it did not focus on the impacts of climate change. In last the 10 years, the climate change impact has become a serious and ongoing problem in Cambodia, so the curriculum needs to improve its goals and objectives to focus on:

- Education on using water and safe water,
- Education on disaster risk and adaptation to climate change,
- Education on population growth rate,
- Education on land and forest use,
- Education on deforestation,
- Education on fossil use,
- Education on global warming,
- Education on ozone depletion.

3.2 Climate Change Impacts on the Life Skills Programs

A series of life skill policies and curriculum development (2005-2009) offer life skills programs, such as cultivation, feeding animals, land safety and improvement, sickness and insect protection, harvest, natural biochemistry products, market-based production, straightening out and saving land biochemistry etc. However, these series of life skill policies and curriculum development did not respond to the climate change impacts as a result of the following activities:

- Use of biochemistry.
- Use the pesticide for insect control,
- Land degradation,
- Production safety,
- Selection of species,
- Natural hazards and disasters,
- Unregulated use of natural resources
- Weather-related mortality, infectious diseases, air-borne respiratory illnesses,
- Crop yields and irrigation demand,
- Changes in forest composition, shift of geographic range of forests, forest health and productivity,
- Changes in water supply, water quality, increasing competition for water,

- Erosion of beaches, inundated coastal lands, costs to defend coastal communities,
- Changing in ecological zones, loss of habitat and species.

3.3 Climate Change Impacts on Vocational Education

As mentioned in Section 3.1, the curriculum was not sufficient in terms of vocational education. As a result, MoEYS sees a need to revise this section.

The technical and vocational education can play a major role in supporting the school and communities that are facing the challenges of climate change, such as food/health security, safety, and shelters.

In this regard, to respond to the climate change in vocational education, capacity needs to be built in these areas for the promotion of environmentally sustainable programs. Such programs will increase public understanding of the interdependence between their environment, communities, country, and their lives. A child-based, facility-based, and skill-based curriculum could be designed by technical and vocational education experts to empower students' preparedness in natural disaster risk reduction techniques. Other activities that technical and vocational education content should integrate include:

- Promotion of specific disciplines, for example, ensuring a skilled and educated workforce in taxonomy and systems, which can competently document the changes and patterns in biodiversity.
- Integrating timely communications, including awareness concerning projects and developments in every area of climate change.
- Including environmental and climate change issues as prominent topics in school curriculums to benefit their communities.
- Establish interdisciplinary studies with technical and vocational education experts who can partner to benefit from methods, background, and overall experiences of professionals in their various fields of specialization.
- Advisory role, as a discipline technical and vocational education, has the capacity to make valuable impact as advisors to improve the services of the program.

4. POLICY AND STRATEGY RESPONSE TO CLIMATE CHANGE

The Ministry of Education, Youth and Sport has a mass of serial policies to respond to education and establish and develop human resources of the very highest quality and ethics in order to develop a knowledge-based society within Cambodia. The activities of policy development generally involve research, analysis, consultation and synthesis of information to produce recommendations. Similarly, the aim of policy for curriculum development is to develop fully talents and capacities of all students in order that they become competent people, with parallel and balanced intellectual, spiritual, mental and physical growth and development. In particular, when students leave schools they will be able to:

- Develop a love of learning that will enable them to pursue employment and continue life-long learning;
- Have attained a foundation knowledge of Khmer language, Khmer literature and Mathematics;
- Have the knowledge, skills and attitudes necessary to improve and maintain their own physical and mental health and to contribute to improve and mainstream of the health of their families and society;
- Manage and take responsibility for their own actions and decisions and be self-reliant
- Value the importance of Science, Technology, Innovation and Creativity; have employment related skills, an understanding of and positive attitude towards work effectively and harmoniously with others;
- Understand other people and cultures, civilizations and histories that lead to building of a public spirit characterized by equality;
- Be active citizens and be aware of social changes, understand Cambodia's system of government and the rule of law, and demonstrating a spirit of national pride and love of their nation, religion and king;
- Protect and preserve their natural, social and cultural environment

Given the strong impacts of climate change on environmental education policy, there is a need to find tools and resources, and key points on environmental education and awareness-raising. Broad topics of environmental education programs include:

- Energy conservation-focus on household sector, where the aim is to reduce consumption of fuel, principally wood, for cooking and warming.
- Soil conservation – topics include the causes and effects of soil erosion as well as physical and biological methods of erosion control.
- Water conservation – crucial concepts include control of water loss by physical and biological measures and protection of water sources.
- Environmental health – includes topics such as disease prevention through appropriate sanitation and water hygiene along with health education.

The position and key points on environmental education and awareness-raising are:

- Education has long-term impacts and should be supplemented with short-term regulatory measures and public information messages on environmental protection. Environmental education should be seen as a continuous and multi- sectorial process, as well as a tool for stimulating reflection, discussion and decisions and attitudes. It should be supplemented with shorter-term regulatory measures and public information campaigns to limit immediate damage to natural resources.

- Formal and non-formal approaches should be harmonized for better results. Non-formal approaches will be more effective if a whole school approach to environmental education is adopted. Schools must not be treated as isolated islands of knowledge; they must be seen as part of the community. Likewise, the community must be brought into the schools, for example, through camp/settlement environmental working groups. Topics should be related to day-to-day life.
- Environmental education and awareness-raising should be closely tied to broader environmental programs. Environmental education should be fully integrated with ongoing efforts to promote environmentally sensitive behavior. Linking environmental educational programs to particular aspects of livelihood is not always easy, particularly when curricula are nationally standardized and examination-oriented. Building such linkages can broaden people's interest in environmental concerns.
- Environmental awareness-raising can promote participation in environmental problem solving.
- Multiple entry points are available for environmental awareness-raising. Non-formal environmental education can be channeled through health programs, adult literacy classes, video sessions, religious services, notice boards, drama and poetry festivals, competitions, etc. Networks of community service and health workers can be particularly effective in passing on appropriate environmental messages, given adequate training.
- Environmental awareness raising and training must include measures to empower communities and their management institutions.
- Environmental concepts can be integrated into formal education programs. Possible approaches to formal environmental education includes supplementing the existing curriculum with additional environmental materials, or developing a separate package of awareness-raising materials. Decisions on whether to introduce environmental education as a separate theme should be made as early as possible. Evidence from past efforts suggests that infusing environmental concepts into an already overloaded curriculum may be less appropriate than introducing an entirely new subject.
- New teaching methods may require improvements in teacher's competencies. In some cases, it may be appropriate to adopt new teaching approaches (e.g. activity based and problem solving approaches) to environmental education. These approaches may demand new skills and competencies from teachers and trainers, with a likely shift away from didactic to teacher centered methods. Capacity building may be required to develop teaching methods and resources.

5. PROPOSED POSSIBLE RESPONSES TO CLIMATE CHANGE EDUCATION

5.1 Vision of MoEYS to Climate Change

Develop quality climate change education for sustainable development in Cambodia.

5.2 Mission of MoEYS to Climate Change

In order to achieve the above vision, MOEYS has the mission of leading, managing and developing the Education, Youth and Sport sector in Cambodia in responding to the climate change adaptation and reduction through:

1. Establishing a Module on Climate Change

This module is designed to help teachers understand climate change issues in a global and regionally relevant context, and incorporate lessons into their curriculum. This can be achieved by the following topics: 1) Atmosphere and the Earth's Energy, 2) Weather and Climate, 3) Climate Change, 4) Lesson Plans, etc.

2. Establishing a Module on Environmental Education

This module is designed to help teachers integrate environmental issues and concepts into the core curriculum for any subject or discipline so as to increase the overall environmental literacy of students. This can be achieved by the following topics: 1) What is "environment", 2) Why do we need to protect the environment? 3) Environmental literacy and ESD, 4) Integrating environmental issues into the curriculum, etc.

3. Establishing a module on Natural Disaster Preparedness and Response

This module promotes the inclusion of natural disaster preparedness and response in school curricula, involves young people and teachers in action plan development and teaches community participation strategies. This can be achieved by the following topics: 1) learning about Earthquakes; 2) learning about Floods; 3) learning about Typhoons/Storms, Hurricanes, and Cyclones; 4. Learning about Tsunamis; 5. Learning about Volcanoes; 6) School infrastructure, etc.

4. Establishing Training-of-Trainer Climate Change Module

This web-based module focuses on training educators, students, formal and non-formal education and advocate for ESD and its practical implications, with reference to climate change issues. This can be achieved by the following topics: 1) ESD: A worldwide priority; 2) How to implement ESD; 3) we all have a role; 4) Challenges; 5) The Big Vision quiz, etc.

5.3 Goals and Objectives

5.3.1 Goal

To build the capacity of teachers, students and communities on Climate Change Education and increase understanding on Climate Change adaptation, and optimize mitigation opportunities for sustainable development.

5.3.2 Objectives

The long-term objective of MoEYS is to enable Cambodia's young people to gain knowledge on climate change. MoEYS's immediate objective is to ensure that all Cambodian children will get knowledge and skills for preventing and solving problems caused by climate change.

To realize the above objective, MoEYS has defined priority activities as follows:

1. Ensuring equitable access to climate change education services.
2. Improving the quality and efficiency of climate change education services.
3. Institutional and capacity development for educational staff for decentralization.
4. Provide students with the knowledge and skills which are relevant to reduction and mitigation of climate change, disaster risk and adaptation.
5. Student can use their knowledge and skills in the communities where they live and get the best and successfully practice from CCE to solve the problems caused by climate change impacts.
6. Develop the foundation for an enduring sustainability education in schools and communities.
7. Support comprehensive, cross-disciplinary classroom and external learning opportunities related to climate change and sustainability education.
8. Provide educational experiences for students to study climate change, including:
 - Causes of climate change
 - Impacts of fossil fuel consumption on environment and living species
 - Natural carbon cycle and effect of carbon-based fuels
9. Assist students to examine how human practices affect the sustainability of populations and ecosystems, including:
 - Impact of land-use decisions, de-forestation, urbanization and agriculture on the environment and living species
 - How consumption and waste contribute to climate change
 - Natural resource management; water, energy and forests
 - How our decisions and actions have an impact on climate change and our ability to adapt to our physical and ecological environment.
10. Use learning resources to empower students and school communities to take action on climate change, and become sustainability messengers
11. Develop comprehensive energy awareness in students on:
 - Sources of energy, the energy system today and in future
 - How energy is used

- How use of energy impacts natural and human environments
- How to make sustainable decisions around energy/natural resource use, from a local, provincial/regional and global perspective.

5.4 Strategy Frameworks

5.4.1 Strategy Analysis

The strategy is built on the principle of encouraging and enhancing innovative teaching approach to integrate quality climate change education for sustainable development and guided by the following:

1. Inter-disciplinary practice
2. Science education
3. Whole school approach
4. General and Technical High School
5. Education on disaster risk reduction

The implementation stage needs to provide adequate design on climate change education with full response to climate change. Post-project evaluation will help schools and communities to work on best environmental education practices. In the implementation of the strategy MoEYS will focus on:

1. Providing the curriculum with standard characteristics in accordance with local and universal practice in addressing climate change.
2. Reinforcing implementation of a child-friendly approach to teaching and learning.
3. Building additional capacity for educator on environmental education to respond to disaster risks.
4. Strengthening monitoring and evaluation of implementation to ensure quality and effective education in responding to climate change.
5. Construct schools following MoEYS standard in accordance with local geography and regulation.

5.4.2 Strategic objectives

On the basis of educational development, MoEYS proposes that resilience to climate change requires that environmental education focus on the following FIVE STRATEGIC OBJECTIVE PRIORITIES:

1. Improve education policy, analyses, research and planning for climate change by:
 - Establishing a Technical Working Group for developing educational policy, analyses, research and planning for climate change.

- Conducting a baseline survey on climate change impacts.
 - Conducting research on climate change impacts.
 - Analyzing climate change impacts.
 - Preparing an Annual Operation Plan for climate change activities.
 - Developing and disseminating educational policy on climate change.
 - Developing climate change supporting documents and materials for primary, secondary and high schools.
2. Strengthen the quality of teacher education and training of education planners for teaching and learning methodology for climate change by:
 - Developing documents on climate change methodology for teaching and learning.
 - Developing tools for monitoring and evaluation of climate change implementation activities.
 - Conducting training workshops.
 - Raising awareness on climate change by involving media.
 - Carrying out monitoring and evaluation.
 3. Conduct curriculum training on adaptation, disaster risk management, and resilience to climate change by:
 - Establishing a Technical Working Group for developing climate change curriculum.
 - Developing climate change curriculum by inclusion of disaster risk management, and resilience to climate change.
 - Providing training workshops.
 - Conducting monitoring and evaluation on curriculum implementation.
 4. Raise awareness on climate change and enhance non-formal education programs through media, networking and partnerships by:
 - Establishing climate change communities and non-formal education networks.
 - Collaborating with various stakeholders with partners.
 - Conducting monitoring and evaluation of impacts of climate change.
 5. Build schools that respond to climate change adaptation and disaster risk management by:
 - Collecting information on locations vulnerable to climate change.
 - Engaging communities.
 - Selecting appropriate locations for building schools that respond to climate change and risk management.

5.4.3 Financing Strategy/Mechanisms:

- Financial Resource Mobilization: RGC contribution, National trust Fund.
- Financial Management Mechanisms: Program-based approach.

5.4.4 Gender integration

The Royal Government of Cambodia has the policy to promote gender in all aspects of development and leadership. Therefore, gender has been mainstreamed into national strategies, such as the Rectangular Strategy II, NSDP, CMDGs and Sector Development Plans. Understanding the status of women and their important roles in the Cambodian society and their vulnerability to climate change impacts, the Ministry of Education, Youth, and Sport will pay more attention to their education and education of younger generations in the future. In formulating the Climate Change Strategic Plan for Education Sector, MoEYS will ensure that:

- Gender and climate change are integrated into the curriculum of education and training programs;
- Climate change response strategies for the education sector are gender responsive; and
- Gender responsive performances in the Climate Change Strategic Plan of Education Sector are monitored.

5.5 Key Messages of Sustainability Education include:

- Each individual is a part of local and global systems.
- Everyone can acquire the knowledge and tools to have a positive impact on natural and human environments.
- Sustainability requires a respect for all cultures and recognition of the interdependence of all people in the global community.
- Indigenous peoples have a long history of sustainability through their traditional ecological knowledge.
- Sustainability lessons learned at school transfer to the home and community.
- Non-Governmental Organizations and community groups provide enhanced opportunities for sustainability education programs and resources.
- Leadership by example means integrating elements of sustainability into all decisions and actions.
- Sustainability, climate change, energy consumption and waste awareness are issues of environmental and socio-economic concern.
- Environmental sustainability issues should be addressed in as many subject areas as possible, in age-appropriate context using a range of educational methods, including systems and futures thinking, inquiry, discovery, active learning and problem-solving.

- Classroom learning and school facilities/operations should work together towards common sustainability goals, including greenhouse gas reductions.
- Sustainability principles apply to the design, construction and renewal of school buildings. This may include transportation, procurement and resource use such as energy, water and waste management.
- School structures and natural outdoor spaces can be used to teach about sustainability.

6. CONCLUSION

Cambodia is one of countries vulnerable to climate change. Natural resources are important for local communities to sustain their livelihood and development. Degradation of natural resources has been caused by natural and human activities. The climate change has led to natural disasters in the country, including floods and droughts that affect socio-economic development and cause environmental problems. Good practices in environmental education and related management is the key. A holistic approach and environmental education shall be incorporated into all sector aspects to respond to adaptation, promoting capacity building, and adaptive capacity of vulnerable people in affected areas. The sectors cooperation is important to support adaptation. National policies, strategies and regulations have been set as national framework to respond to climate change and challenges of adaptation.

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