

សាលាទទាំងទីឆ្លំពេញ PHNOM PENH CAPITAL HALL

ECO-CITY CONSTRUCTION OF PHNOM PENH

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I- GEOGRAPHY OF PHNOM PENH

- Phnom Penh is the capital city of Cambodia which is located on the banks of Mekong, Tonle Sap and Bassac rivers. These rivers provide freshwater and river ecosystems as vital resources for sustainable environmental conditions, beautiful nature and a prosperous culture for the people of Phnom Penh since the past until now.
 - Area: 692,46 km²
 - Administrative divisions: 12 Districts (Khans), 105 Communes (Sangkats) and 953 villages
 - Population: 1,461,853 (766,118 females) in 2017
 - Population growth rate: 3.2% per year
 - Weather: 35°c, Wind N at 10km/h, 60% humidity
 - Geography: flare pan area



- Phnom Penh is the heart of Cambodia which has been developing on all sectors such as economy, social affairs, culture, tourism and infrastructure. The flow of tourists and people who pass through to earn a living everyday causes to persistently population growth in adding to nearly 1.5 million permeant residents living the city. For the time being, the change of environment and development is drawing our intention to maintain clean environment and beautiful city which lead Phnom Penh city to change its face, acquire endless development, gain recognition, and constantly receive awards at the International level.
- The development of infrastructure in Phnom Penh city comprises of expansion of streets, roads, bridges, park renovation, public lighting, the renovation of sewage systems, ditches, a contaminated water pumping station, solid and liquid waste management in order to promote quality of environment and people's welfare.



PHNOM PENH UP TO DATE



II- DEVELOPMENT AND ENVIRONMENTAL ISSUES

 The endless growth of the population as well as the economic and social growth that have occurred since the year 2000 have led Phnom Penh city to confront many new challenges such as traffic congestion, environmental pollution, solid and liquid waste management, the creation of high density new and large buildings, city's boundary expansion, and disorderly incremental of residential areas in the suburbs etc.

A- Challenges:

A-1 Air pollution

- Exhaust emissions from motor vehicles during traffic congestion and from the use of generators
- Steady growth of motor vehicles and some of them are in poor quality
- A large amount of dust in the atmosphere causes from the transportation of sand, soil and activities on construction sites
- Giving off noxious odors and garbage burnings, and
- A small amount of small and medium-scale of factories or handicrafts are currently using black oil in their production, and some of them do not follow the instructions to reduce sound and vibration.

A-2 Water pollution

- Domestic wastewater collected by sewerage system and discharge into ponds and natural lakes
- No wastewater treatment plant in Phnom Penh
- No separation pipe for storm water and sewage, so it will be costly for treatment and causes flash flood during the heavy rain.
- Sewerage system does not cover the whole city and it makes inundations.
- Septage is pumped from household's septic tanks and discard illegally in natural lakes.
- There are only 65% of factories and enterprises that have constructed proper wastewater treatment facilities in accordance with the technical standards while 35% have yet done it, and
- A number of handicrafts have discharged used oil and polluted wastewater into public sewerages or
- into lakes and streams or rivers.



A-3 Soil pollution

- Disposal of solid waste at the sources are inappropriate
- Means of transportation for solid waste including trucks, labors, equipment and materials being used for providing services are insufficient, most of which are old and not in compliance with the technical standards.
- The quality of waste collection service (cleaning, collection and transportation) is notable lacking.
- The existing of waste fee have not yet updated
- Limited human resources as well as budget and technology management expertise at basic level or dumping sites in relation to solid waste management.



B- Development and Sustainable Environment

- In order to address the above challenges based on the rectangular strategy of he Royal Government and fundamental capital development strategy, as well as the support and assistance from countries and development partners since 2005, Phnom Penh Capital Hall has set up the Land Use Master Plan to orient development until 2035 which is being carried out now.
- Furthermore, the development of Phnom Penh city is to ensure the sustainable development of the economic and infrastructures, to promote the quality of life, to improve the living environment of people in the city, and to maintain the quality of air for the welfare of the public, a number of regulars works have to be fulfilled as follows:



B-1 Air Sustainability

B-1-1 Reduction of traffic congestion

- Establishment of satellite cities
- Expansion of carriageway's widths and equipping of carriageway dividing barrier
- Repair of bitumen road at subordinate roads and small crossroads
- Construction of detours in the city's town or city belt roads
- Construction of bridge over the river
- Building of overpass at the intersection
- Equipping of traffic lights, signs and signals
- Establishment of city bus

B-1-2 Vehicle technical inspection work

In compliance with Prakas No.31 PPWT of the Ministry of Public Works and Transport, the Phnom Penh Department of Public Works and Transport has carried out the vehicle technical inspection work (check) in order to reduce the exhaust emissions from vehicles into the atmosphere.

MAP OF THE SATELLITE CITIES

MAP OF THE THREE BELT ROADS





GREEN GROWTH







OVERPASS







B-1-3 Creation of green surface area

The Phnom Penh Capital Hall has built 82 gardens with a total surface area of 645,989 square meters and plantation of trees along the roads in order to contribute decreasing green house gases.

B-1-4 Noise Reduction

- As power supply is being increased, the use of generators to supply electricity can be reduced 95%.
- Factories and handicrafts must follow a number of techniques guided by the Phnom Penh Department of Industry and Handicraft in order to reduce vibrations.

B-2 Water Sustainability

- Water supply networks have increased to 2,156 km which has the capacity to produce 430,000 m³ of water/day equal to 90% of the scope of the total area of Phnom Penh Capital and supply 24 hours per day.
- Under the phase 4 of Flood Control and Drainage Improvement in Phnom Penh it also includes the feasibility study of wastewater treatment plant to be set up at the southern and northern areas of Phnom Penh city
- Environmental Law and Regulations are in place to control water pollution
- Wastewater from all sources such as industries, factories and commercial areas etc... is subject to have prior permit from the Ministry of Environment before they can discharge their effluents into the public sewerage.

MEDICAL WASTE INCINERATION CENTER



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- Under the phase 4th of Flood Control and Drainage Improvement in Phnom Penh which has been sponsored by Japanese Government, the Phnom Penh Capital has improved its sewerage system and it has also included the feasibility study on establishment of wastewater treatment plant at the southern and northern areas of the city.
- Environmental Law and Regulations are in place to control water pollution
- Wastewater from all sources such as industries, factories and commercial areas etc... is subject to have prior permit from the Ministry of Environment before they can discharge their effluents into the public sewerage.

B-3 Soil Sustainability

- Educating and disseminating people to dispose their wastes properly and follow the waste collection schedule.
- Implementing of waste separation at source in public markets (wet and dry wastes) and public areas in the city.
- Imposing of fines for littering in public in order to improve sanitation and environment in the city.
- Mainstreaming knowledge of waste management in the educational system and educational curriculums.
- Preparing the materials for educating and disseminating such as banners, leaflets, posters, T-shirts and the production of one minute education spots to be broadcasted by all social medias.
- Organizing a consultation workshop on "Determination of stakeholders' roles and strategy for enhancement of waste management and services provision of cleaning, collection and transporting.
- Issuing an announcement targets to marts and supermarkets to ban for free delivery of plastic bags to their customers (in compliance to the Sub-Decree on the Management of Plastic Bags).
- Establishing the management and separate storage of medical and battery wastes.
- Improving the landfill site from open dump to a site where garbage is covered by soil, and promote recycling activity
- Delegating a part of work on waste management to the 12 district authorities to sign MOU with CINTRI to match the schedule of waste disposal and collection
- Creating 2 waste inspectors for each of 105 sangkats (communes) to educate and disseminate people on SWM
- Phnom Penh Waste Management Strategy and Action Plan for 2018-2035 has been set up lately.

WASTE BANK IN SCHOOL





. P.Shool : 150\$ - 250\$. S .Shool : 250\$ - 500\$





MEDICAL WASTE INCINERATION CENTER



MANAGING AT LANDFILL SITE



WASTE RECYCLING FACILITY

- The capacity of this recycle facility at Dangkor Landfill site is 150 ton/day, but in present they start from 70-100 ton/day and produces the output as below:
 - Organic waste 50%
 - Plastic bag 25%
 - Valuable materials 5%
 - Non valuable 20%





Water Bottle

- Plastic bottle Reproduction
- Material needed: used plastic bottle 20t/month
- Final Products: Plastic Bottle for Drinking water















Plastic Bags

Plastic Bag Reproduction

- Raw material : used plastic bags, grain plastic
- 10t/month
- Final Products: Plastic Bag white and black















Used Paper

Paper waste Recycling -ROYAL

- Raw material needed: used paper, 400t/month
- Final products: board& writing Paper







Plastic Wire

Plastic Wire Handicraft

- Raw Material Needed: used plastic bag, 2000 kg/month
- Final Products: Plastic wire for local market





Aluminum cans









Coconut Charcoal

- Raw material: Used charcoal and coconut shell, 10t/month
- Products: clean charcoal









Waste Reduction through Biogas Production

- The Advantage of using biogas unit: Reduce municipal waste/ Saving money from LPG cost / Produce slurry and EM/ Improve Agricultural Productivity / Households sanitation/ Reduce greenhouse gas components which led to global warming and climate change. Some organic waste can be used for biogas production are: farming Animal's dung, Human excreta, Food and Kitchen waste, vegetable waste and backyard waste.
- The Biogas units has been established for the poor communities in Dangkor and Meanchey districts supported by CITYNET, Phnom Penh Biogas Initiative (PPBI).



III- CONCLUSION

 On the basic of the Master Plan and City Development Strategy which have been fulfilled by local authorities and citizens with the highly effective partners from private sectors and relevant non-governmental organizations as well as the implementation of road map of green development and national strategic green development of the Royal government of Cambodia have transforming Phnom Penh City into an Eco-City and ensuring the city will become a city of 21st century that is modern, economic growth and has a good environment with great price of the nation.

Thanks for your kindly attention!