Five circles are arranged in a horizontal line at the top of the slide. From left to right, they are: a solid light purple circle, an empty light purple outline circle, a solid light purple circle, an empty light purple outline circle, and a solid light purple circle.

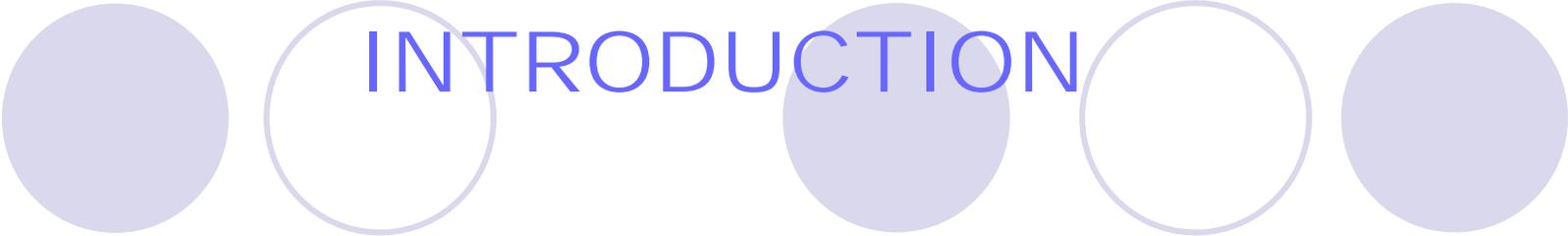
SUGGESTIONS ON MEASURES TO FACE THE CITY-FLOOD

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INTRODUCTION

- Climate change has occurred and become the most threatening environmental, social, and economic problem in the world
- Vietnam is considered as one of the highest risk countries which are facing the effects of climate change.
- It is estimated that about 4.4% of Vietnamese territory will be sunk under sea water whenever it rises up to one meter if the temperature increases 3°C in the year 2100
- We can realize the increasing of climate change through some strange and significant climatic phenomena such as lots of terrific hurricanes happening in recent years



INTRODUCTION

- The climate change catastrophe mainly caused by human with lots of non-environmental-friendly activities
- Coastal, river and canal erosions have occurred continuously and quite severely
- Climate change, together with the raise of sea level, makes the city drainage become more complicated
- The city-flood is under effects of climate change and urbanization

The header features five circles in a horizontal row. From left to right, the first, third, and fifth circles are solid light blue, while the second and fourth circles are hollow with a light blue outline. The word "CAUSES" is written in a blue, sans-serif font, centered between the second and fourth circles.

CAUSES

- The major cause is the emission of carbon dioxide, which brings about the Glasshouse Effect, the increase of the Earth temperature, the melt of icebergs, and the rise of sea level
- The movement of the Earth itself may also cause climate change
- Human improper activities do harm to the environment such as destroying riverhead forests and filling up rivers
- The city expansion projects destroy many ponds and lakes, canals and springs



CONSEQUENCES

- Huge amount of carbon dioxide emission makes the climate change strangely and abnormally
- Filling up rivers and encroaching riversides will eliminate water containers and natural drainage system
- The city expansion projects also destroy many water containers; meanwhile, there are no projects to compensate for those shortages
- Vietnamese coastlines have been eroded continuously; coastlines have invaded farther into the mainland
- Terrific floods have severely eroded the basin of rivers at almost every riverside

COASTLINE EROSION



Coastline erosion at Vung tau

COASTLINE EROSION



Coastline erosion at Vung tau

RIVERSIDE EROSION



RIVERSIDE EROSION



Riverside erosion at Tien giang

ACTIONS NEED TO BE DONE

- Ministry of Natural Resources and Environment has approved a three-stage national program of facing with climate change from 2009 to 2015 which costs approximately 1965 billion VND
- Protecting land from erosion, i.e. preventing land loss and protecting coastline dyke from damages is to preserve the land, the water by reforesting and preventing deforestation
- We should have an action plan for flood water receding, wave and current extermination

TECHNICAL SOLUTIONS FOR FLOOD FIGHTING

a. Flood due to climate change:

- Large scale sea level raise fighting: build protective dykes along coastlines of Vietnam
- Salt-penetration fighting: dams for preventing salt-penetration and receding floods are suitable

b. City-flood due to urbanization, climate change and other reasons:

- Water contain system should be prepared enough capacity to contain water from many sources.
- It's better to control water rising level caused by tidal, inundation, rain and others by using drainage system of 4 grades

TECHNICAL SOLUTIONS FOR EROSION FIGHTING

- Build anti-erosion system offshore in order to decrease wave and current strength on the dykes by anti-wave reforesting or seaward encroaching dykes
- Sand erosion caused of wind and wave can be ceased by anti-wave reforesting (planting sea water morning glory, casuarinas...etc) or build simple anti-wave and anti-current constructions
- To protect riversides or canal sides from erosion, we should plant some protective trees such as bamboo, nipa, aegiceras...

COASTLINE PROTECTIVE DYKE



Protective dyke at Ninh thuan

SAND PROTECTIVE FENCE



Sand protective fence at Ba ria- vung tau

COASTLINE PROTECTIVE GEOTUBE



Sand protective geotube at Ba ria- vung tau

COASTLINE PROTECTION



Sand protective geotube at Ba ria- vung tau

CANAL SIDE PROTECTION



Protective trees along Cho gao canal – Tien giang

RIVERSIDE PROTECTION



Riverside protective construction – Binh quoi



CONCLUSION

1. To face the climate change, to fight against city-flood are the most important and essential missions.
2. A functional team should be assigned to supervise and follow the project progress.
3. To prepare action plans for short and long term project, include a system of climate change and its effects measuring.
4. To get professional ideas and suggestions from local and oversea specialists of related subjects and problems



CONCLUSION

5. To broadcast the issues openly in order to share knowledge and to get supports from the public.
6. To set up reliable regulations of preventing improper activities which may harm environment, speed-up climate change and intensify the city-flood. To set up measures of detecting and controlling violations.
7. To have concrete programs and solutions to face with climate change and city-flood timely and effectively.