

Enriching the Lives of the Citizens through Waterfront Development



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Chairman of the Advisors to Governor of Bangkok

Bangkok Metropolitan Administration

at The 10th Plenary Meeting of ANMC21

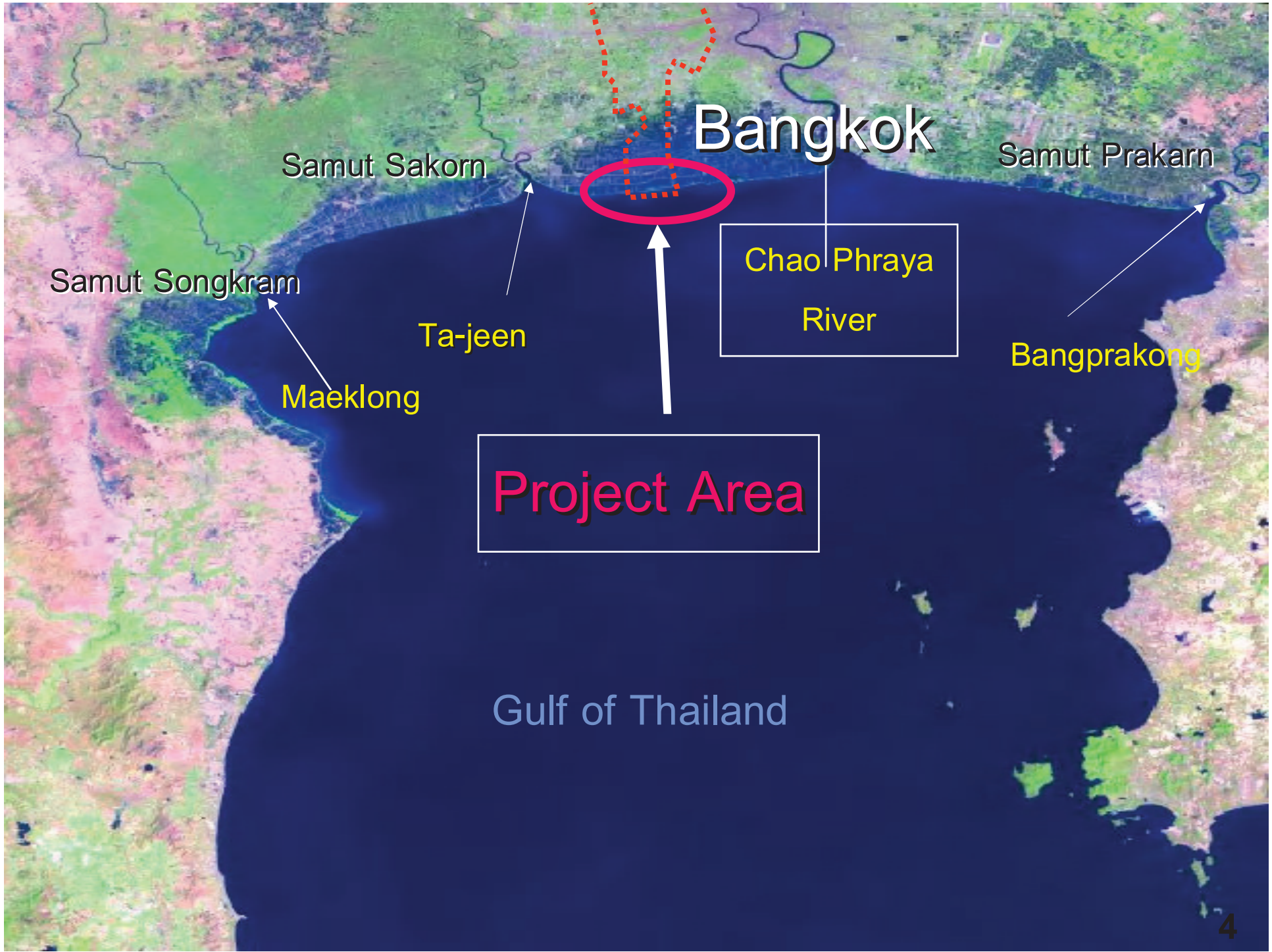
10 – 11 October 2011,

Seoul, The Republic of Korea



The Project of the Bang Khun Tien Coastal Erosion Protection and Prevention, Bangkok





Bangkok

Samut Sakorn

Samut Prakarn

Samut Songkram

Chao Phraya
River

Ta-jeen

Bangprakong

Maeklong

Project Area

Gulf of Thailand

Physical background of Bang Khun Tien Area

1. Fertile mangrove forest area in the old day.
2. The change of land utilization plus natural conditions caused coastal recession and lost of mangrove forest.
3. Coastal line is approximately 4.7 Km. long.

The situation of coastal erosion :

1. Bangkok has tried hard to save Bang Khun Tien coastal area with many measures including city planning regulations and rock pile dam but it cannot sustain the coastal area.
2. Average width of eroded coastal strip is 800 – 1,000 meters.
3. Rate of erosion is approximately 1.4 – 4.5 meter/ year.

Result from mathematical models :

- The coastal line will be eroded 50 meters in 2016
(Mangrove forest will be completely destroyed)
- The coastal line will be eroded 100 meters more in 2036 (Shrimp pond will be 50 meters destroyed.)
- The study found that, to solve the problem, the construction of hard structure is necessary to trap the sediments. Meanwhile, to be conducted along with this structure is additional mangrove forest plantation.

Factors that caused Bang Khun Tien Coastal Erosion

1. Decreasing amount of sediments from the Chao Phraya River due to sediments were trapped above the dam.
2. Occurrence of huge waves during monsoon season
3. Long-shore Current
4. Annual subsidence of the ground at the average of 1-2 cm. per year.



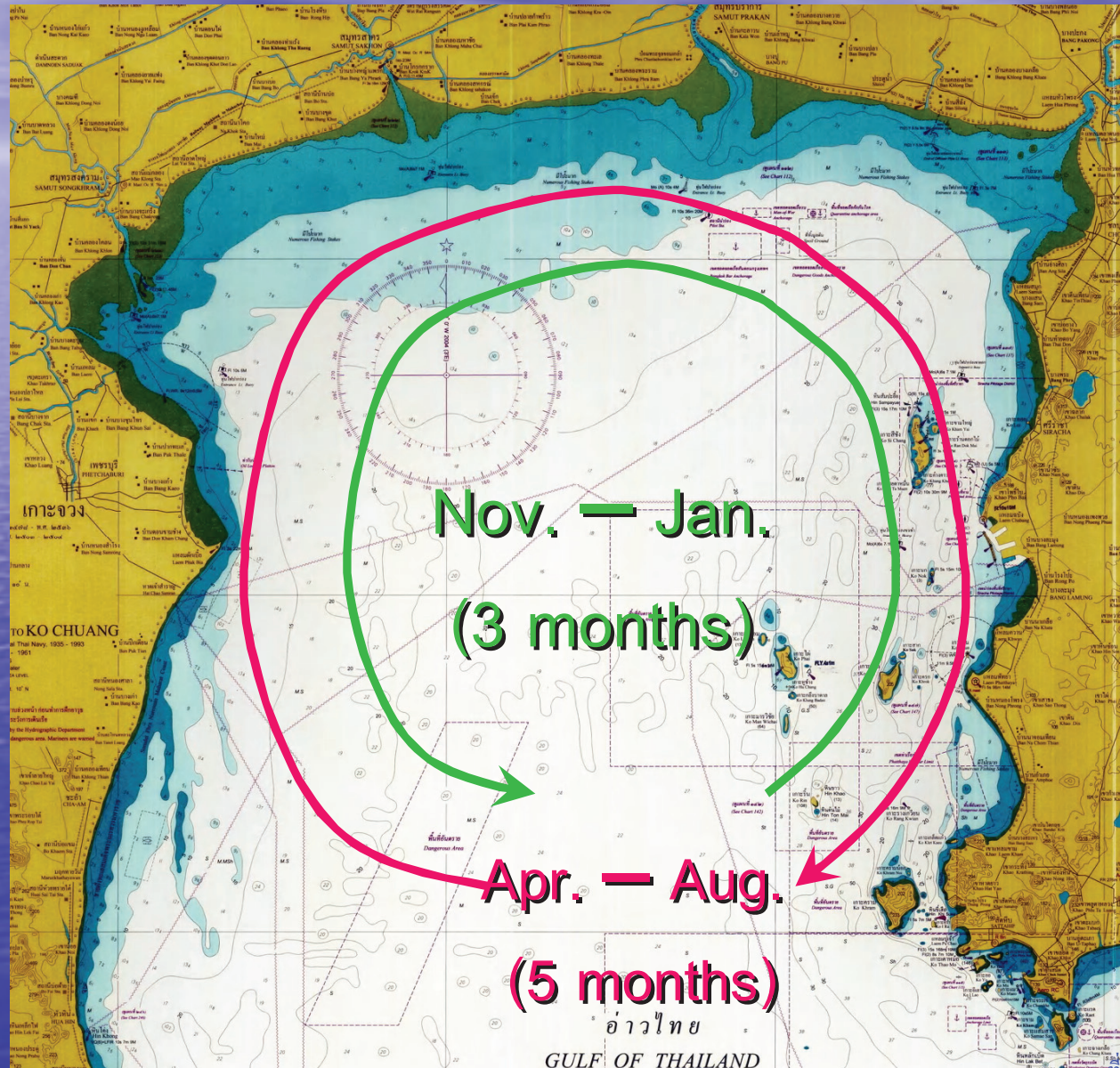
General condition of wind and wave in the upper Gulf of Thailand



The condition after monsoon season



Current stream in the upper Gulf of Thailand



The solutions by the BMA

- 1. In 1989, the cabinet approved the allocation of 2,735 rai of mangrove forest from the national permanent forest to the BMA to nourish and protect the coastal erosion and mangrove forest.*
- 2. In 1991 – 1996, the BMA embanked the shore with rocks and continuously strengthened with more rocks. The rocks embankment structure was 2 meter high, 6 meter wide at the base and 5,020 meters long along the shore. Though bamboos were also piled next to the rocks formation, the coast can be protected only at a certain level. More effective measures was studied.*
- 3. In 2005 – 2007, the BMA assigned its City Planning Department to conduct a study project of the protection of Bang Khun Tien coastal erosion. The result was that the T-shape sediment traps (T-Groin) and mangrove plantation was the most effective measure.*



Piles of wheels to weaken the waves.

Summary of measures by Bangkok Metropolitan Administration according to the study.



1. Hard (Permanent) measure :
Construction of sediment traps (T-Groins)

2. Temporary measure : bamboo piling
to protect coastal erosion



3. Soft measure : Mangrove plantation
(Mangrove Belt / Buffer Zone)

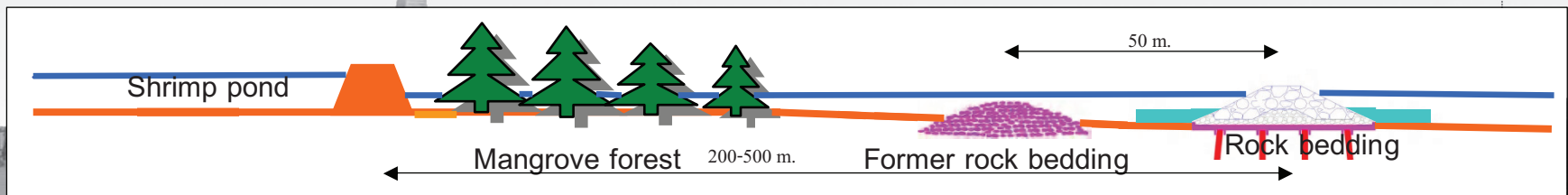
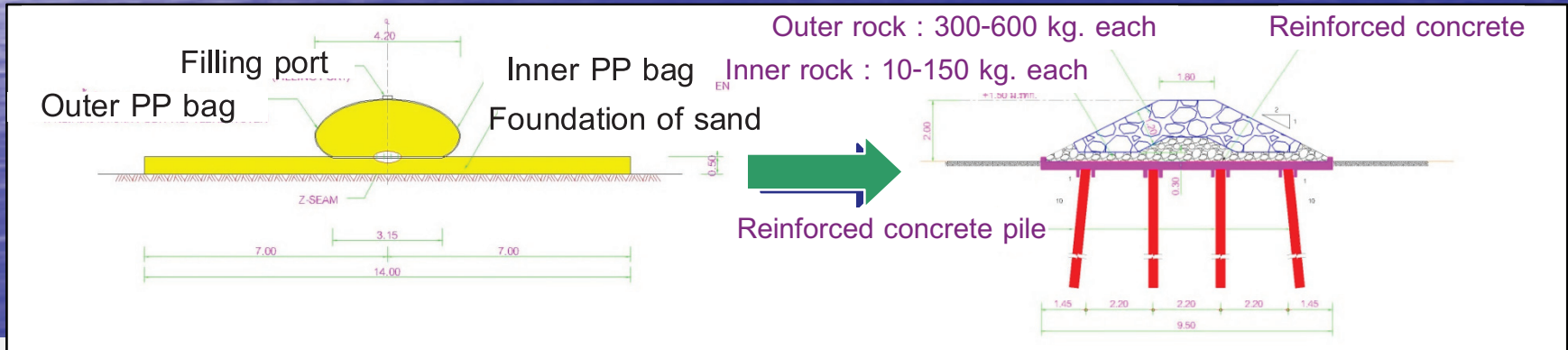
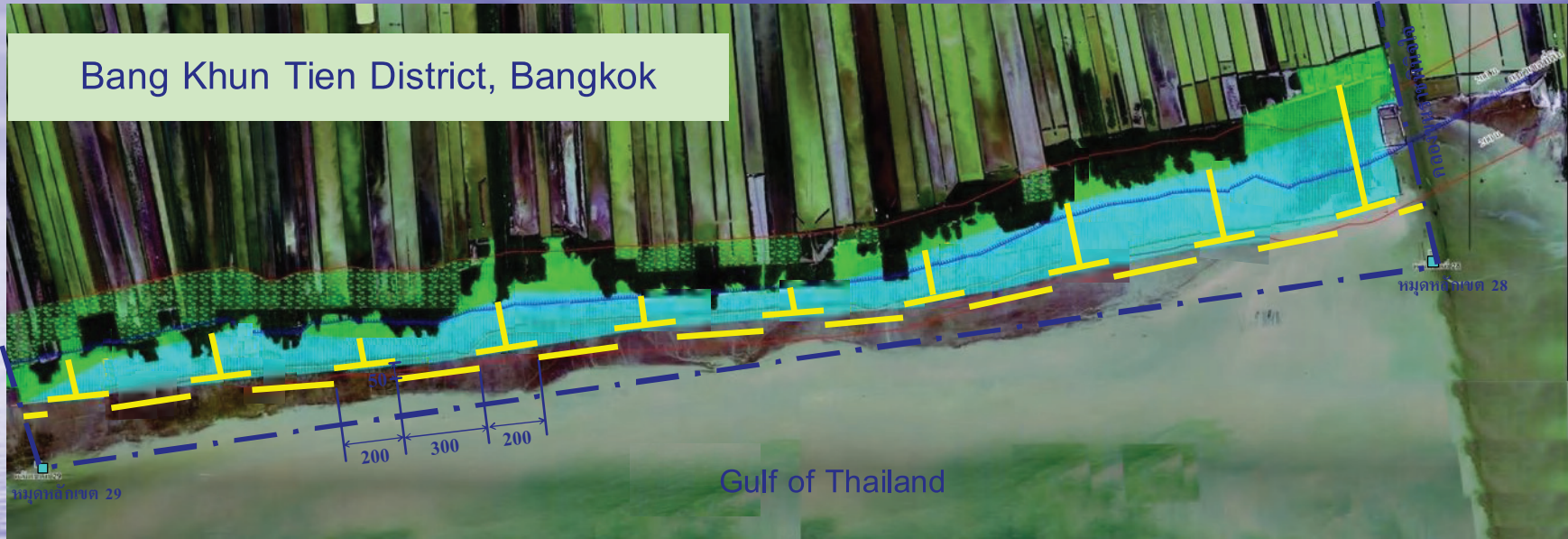
The setting of Forums for Public Opinion

Before the construction of T-Groin, the BMA held 3 times of public hearings: June 2008, October 2008 and February 2009 and had clarification meetings with the Commission on the Natural Disaster Protection and Mitigation, House of Representatives in order to discuss how to secure Bang Khun Tien coastal area. The agreement with the land owners along the coastal line were :

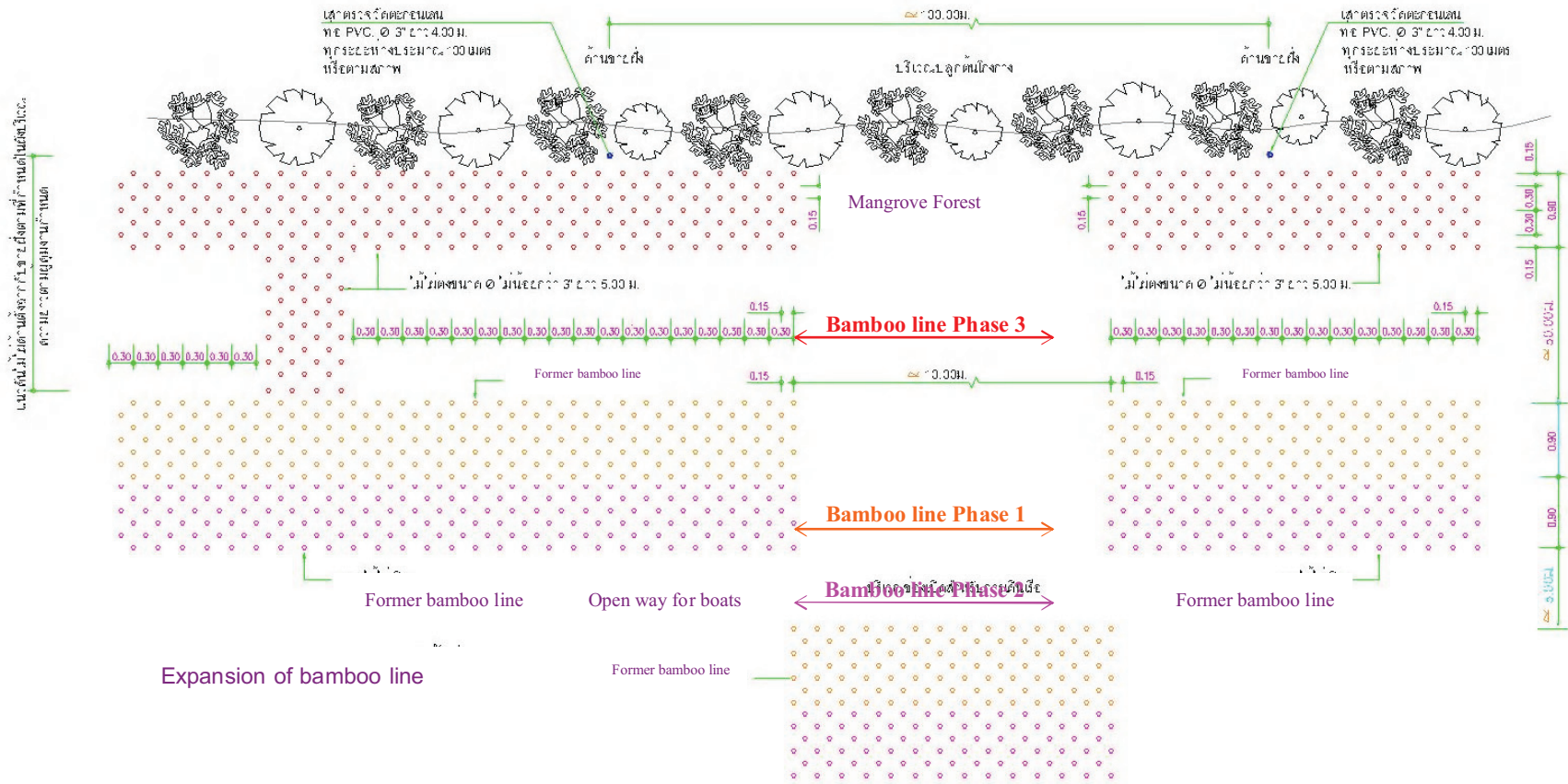
1. The landowners were consent that the BMA modify the T-Groin construction from sand bags to rock bedding to avoid the rupture of the sand bags that might be harmful to the area ecosystem and way of local lives.
2. As a temporary measure, BMA should prevent the coastal erosion with the utilization of bamboo sticks to prevent any damages occurring during the construction of the rock bedding.

The adjusted model of T-Groin :

From Sand bags to T-shape rock bedding with an interval of 500 meters on reinforced concrete cement, and another outer line of 300-meter rock bedding.



Bamboo construction plan : to protect Bang Khun Tien Coastal Erosion



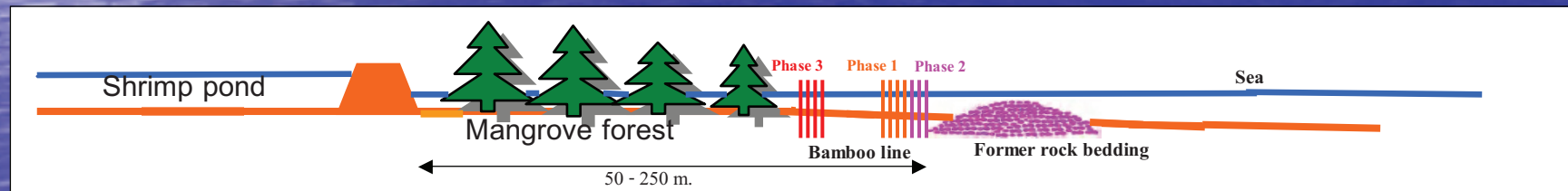
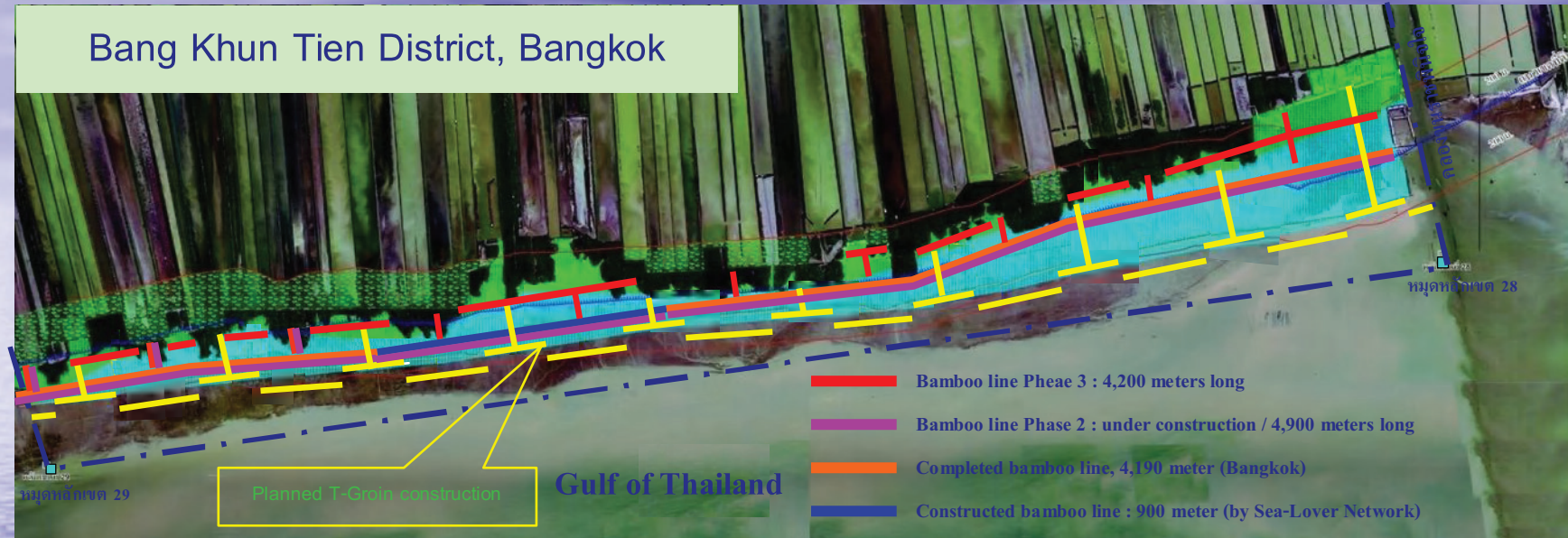
Phase 1 : Completed in March 2011.

Phase 2 : Under construction, to be completed by December 2011

Phase 3 : Budget approved, to start construction in December 2011

Bamboo construction plan to protect coastal erosion

Bang Khun Tien District, Bangkok



The finishing of bamboo piling to protect
Bang Khun Tien coastal erosion.





Thank you