

# World Water Day 2017 Celebration

## Twante Canal Integrated Management Project in Myanmar

14 March 2017



# CONTENTS

**I. Project Rationale**

**II. Project Proposal**

**III. Project Impacts & Compliances**

# I. Project Rationale

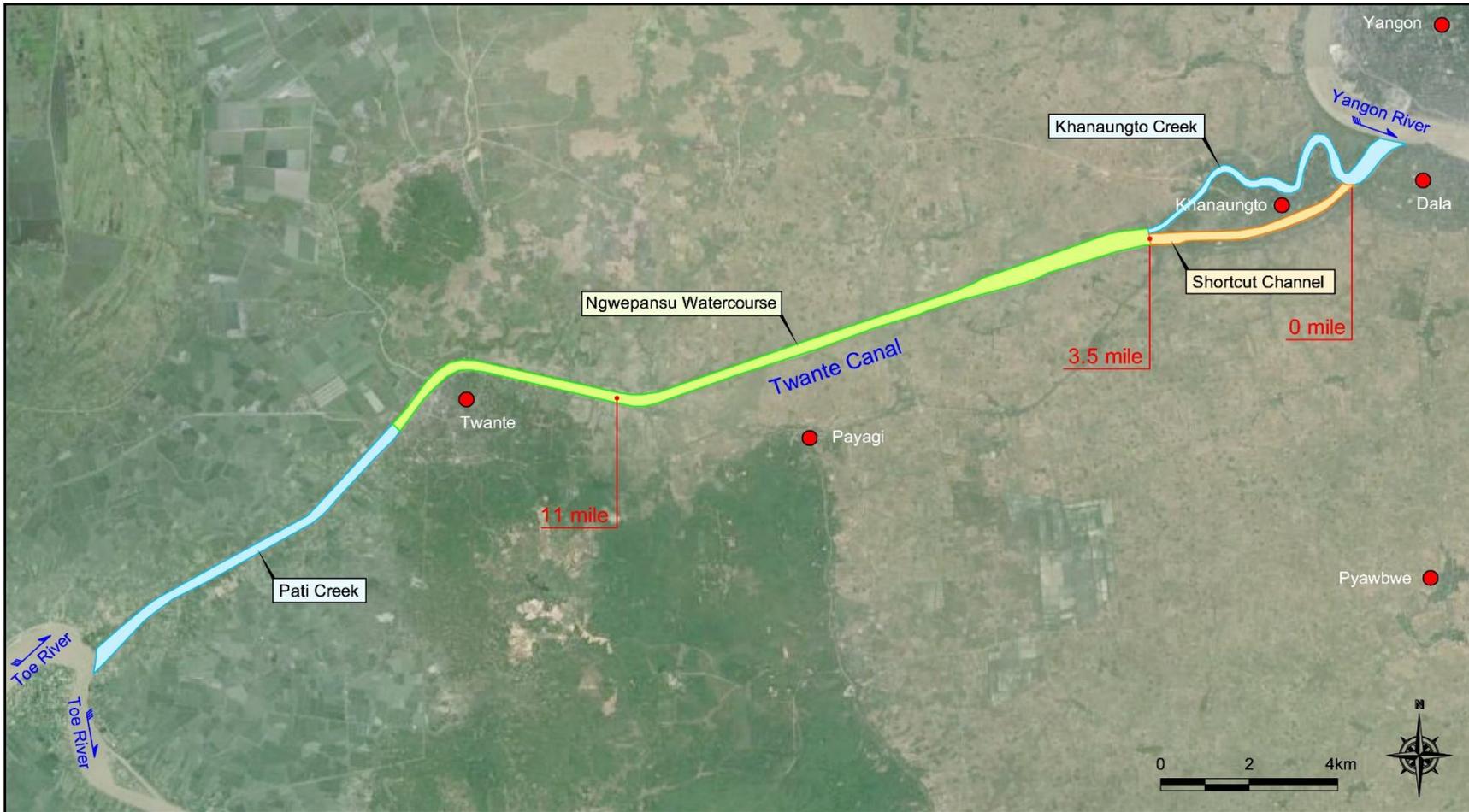
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# 1 Project Background



- 🕒 **Twante Canal** is an artificial waterway **connecting Ayeyarwady Delta and Yangon River** in Myanmar with the length of 34 km.
- 🕒 Since the completion in 1883 by England, it has been **heavily used for inland navigation** between Ayeyarwady Delta and Yangon City.

## 2 Problems & Needs (Morphological Change)



- 🕒 **Khanaungto Creek** (old canal) from 3.5 mile to 0 mile was overworked and repaired for the smooth inland navigation in 1908
- 🕒 **New shortcut channel** from 0 mile to 3.5 mile constructed by the British Government in 1917, but it caused **critical hydraulic instability**.

## 2 Problems & Needs (Bed & Bank Erosion)



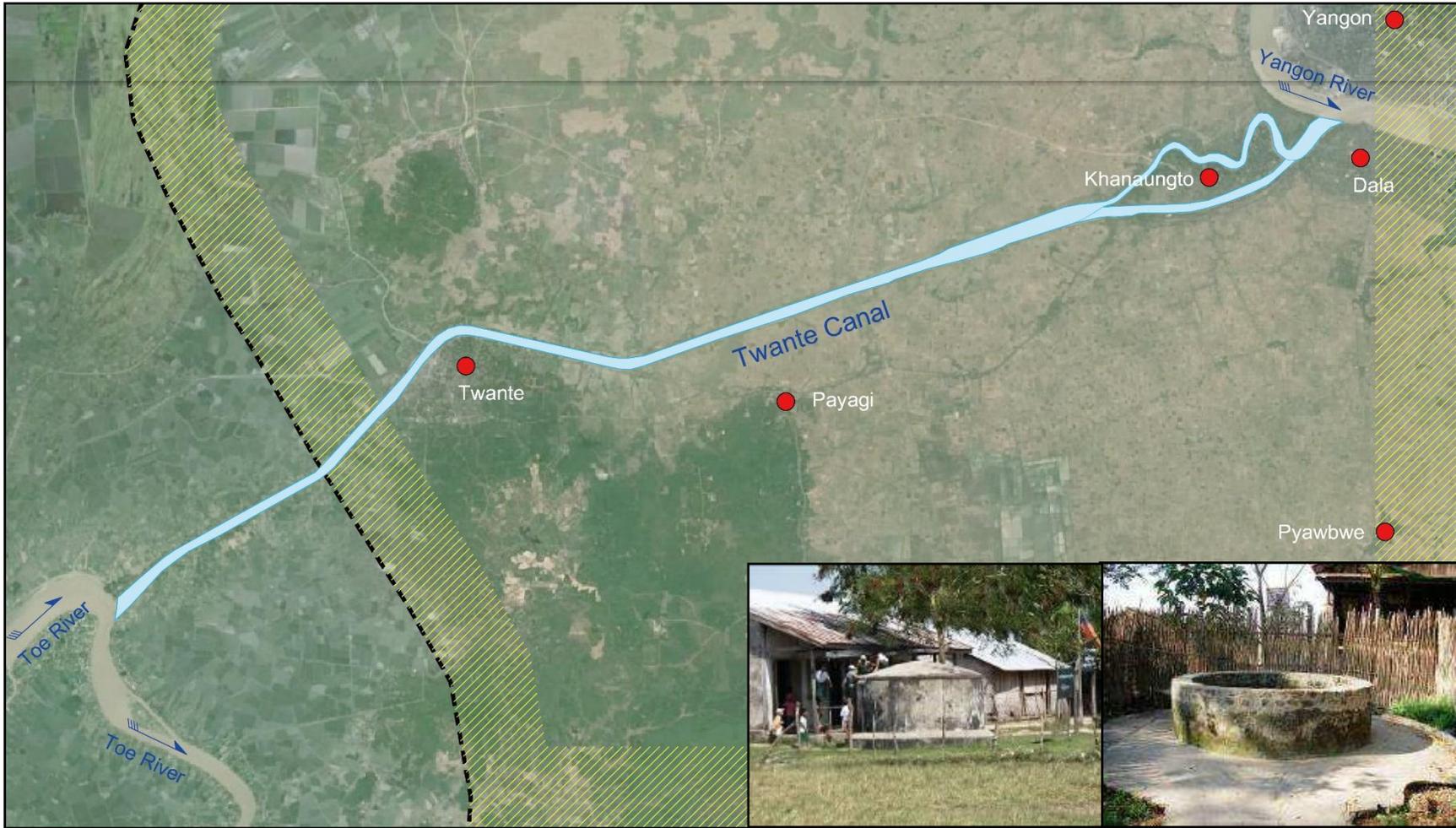
- 🔵 **High-speed current due to tidal effect** ( $v_{max} \approx 3.5$  m/s during ebb tide)
- 🔵 **Serious bed and bank erosion at the junctions**
  - ✓ Damage of bank protection and land loss for residential area and farmland
  - ✓ Threatening the safe ship navigation due to large-scaled eddy generation

## 2 Problems & Needs (Flood Vulnerability)



- 🕒 The **Ayeyarwady delta** is characterized by **low land and flat terrain** by formation of swampy lands.
- 🕒 **Flood risks** in Khanaungto, Dala & Twante Townships
  - ✓ Flood inundation in **low lying area** during the **spring tide**
  - ✓ Increase of flood damage potential with new urban development according to **Strategic Urban Development Plan of the Greater Yangon**

## 2 Problems & Needs (Saltwater Intrusion)

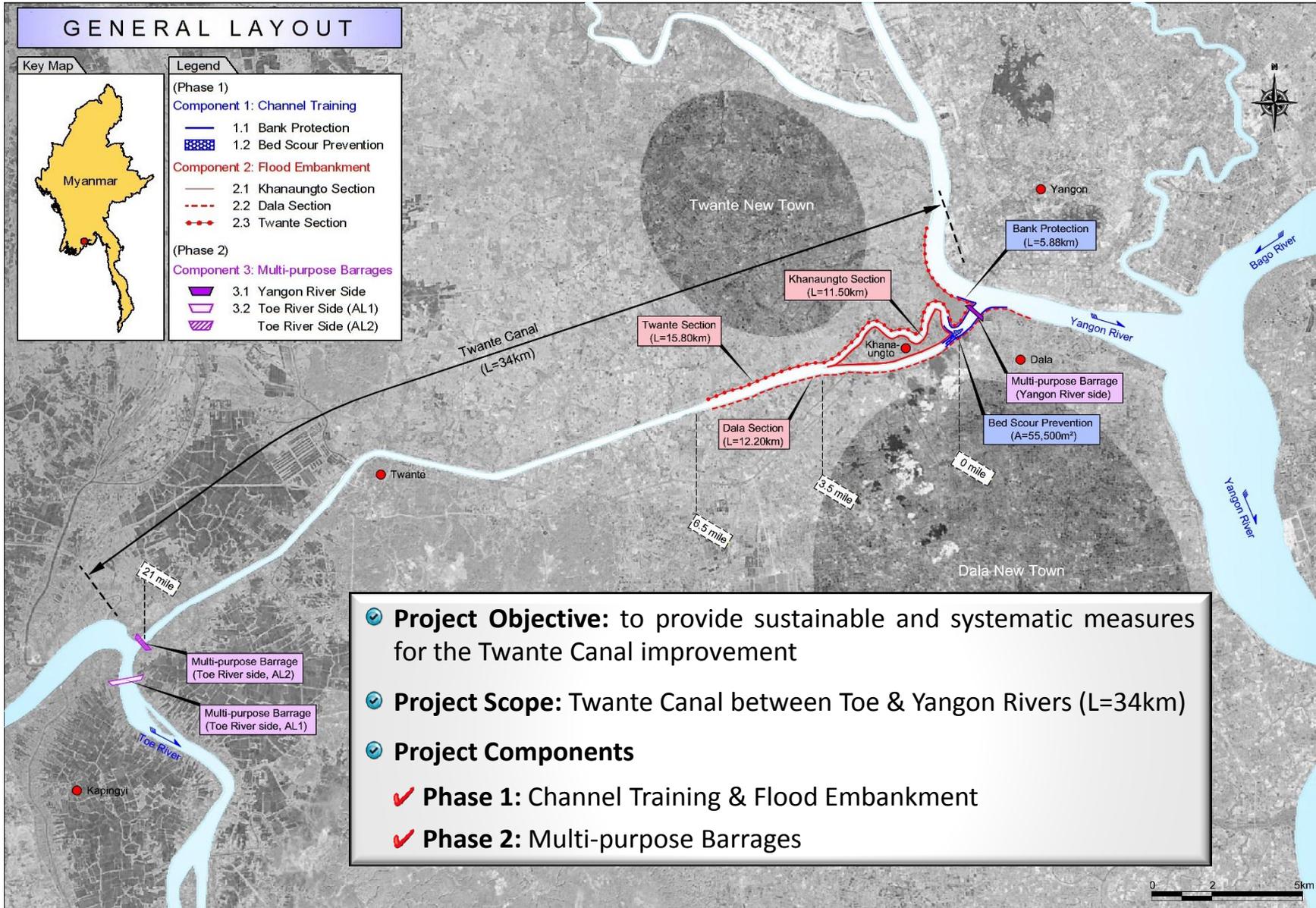


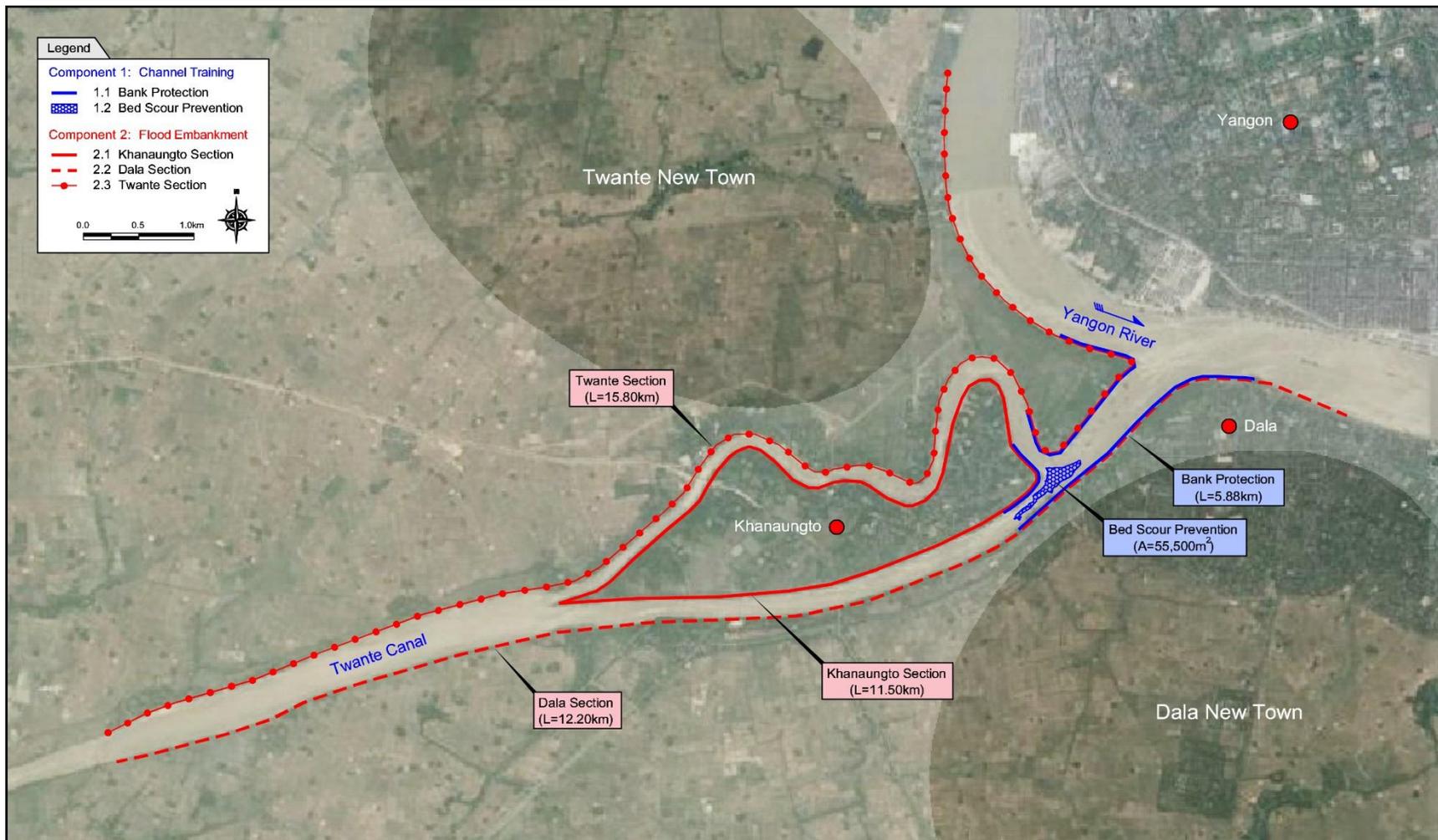
- ☑ Limited arable areas due to saltwater intrusion and soil salinity
- ☑ Requiring freshwater with urban development in Khanaungto, Dala & Twante Townships

## II. Project Proposal

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# 1 Project Outline





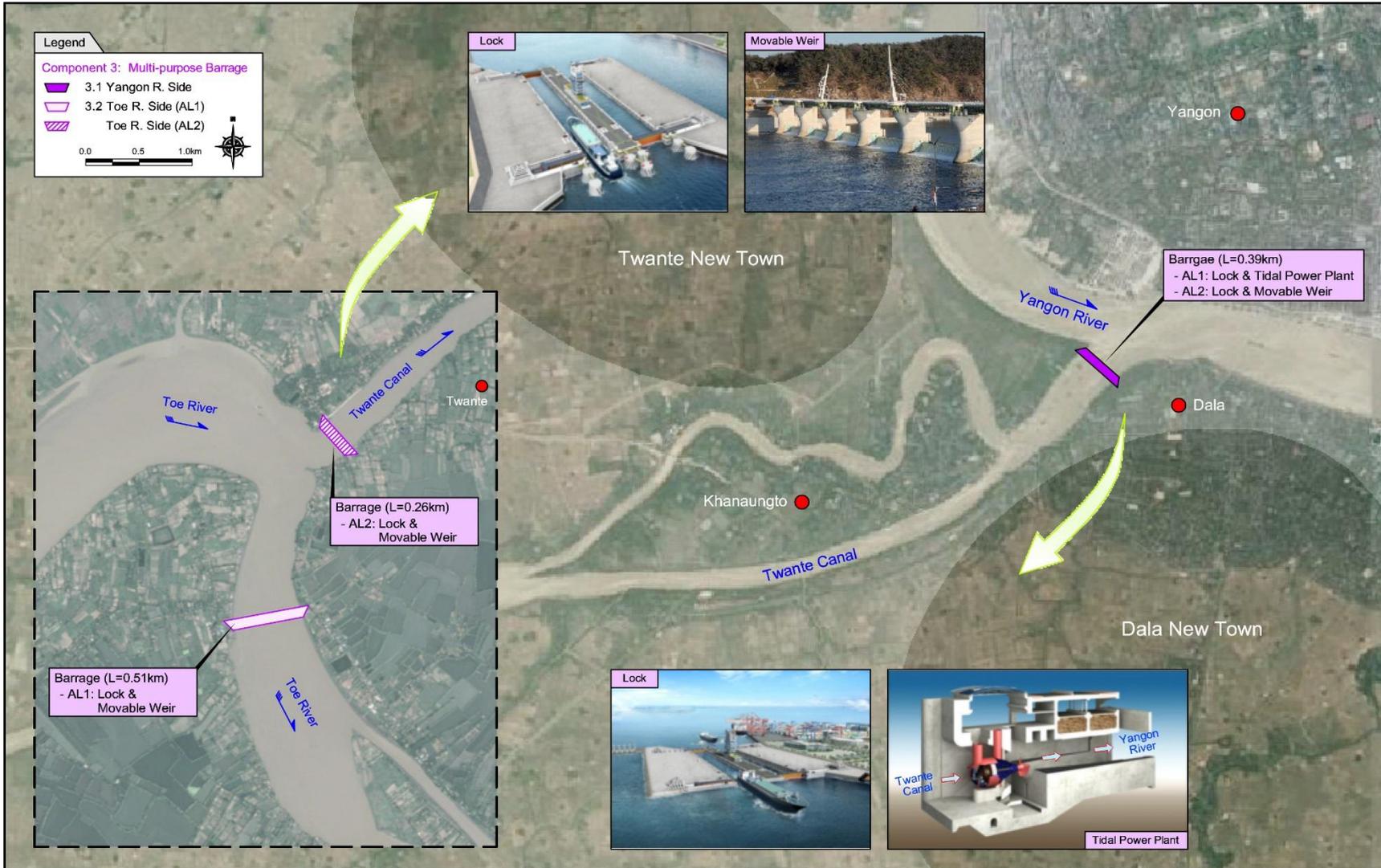
🕒 **Channel Training:** to reduce the flow velocity at the tidal flow and to stabilize the flow field along Twante Canal

🕒 **Flood Embankment:** to secure the design flood level during the largest spring tide



## 2 Project Scope (Phase 2 : Multi-purpose Barrages)

Project Proposal



🔗 **Multi-purpose Barrages:** to secure constant safe ship navigation, mitigate the flood risk during the largest spring tide, and provide abundant fresh water from the upper Ayeyarwady

## 2 Project Scope (Phase 2 : Multi-purpose Barrages)

### Comparison between Alternative 1 & 2

Division	Alternative 1	Alternative 2	Remark
<b>Cost</b>	<b>Extreme</b>	<b>Moderate</b>	
Barrage (Toe)	Toe River (L=510m)	Twante Canal (L=260m)	
Barrage (Yangon)	Power plant (high cost)	Movable weir	
<b>Benefits</b>	<b>Extreme</b>	<b>Moderate</b>	
Water supply	++	+	
Electric power	+	-	
<b>Social &amp; Env. Impacts</b>	<b>Moderate</b>	<b>Expectable</b>	
Submerged area	+	-	
Ayeyarwady flood	+	-	

※ ++ (extreme), + (moderate), - (none)

✓ **Key Factors of Barrage Design:** location, scale, type, components, etc.

- Depend on **water supply extent & power generating capacity**

✓ **Further study parameters** on technical feasibility, economic efficiency, social & environmental impacts, financial burden, and etc. with **fresh water demand** for **new town development plan**



### 3 Project Prospect

✔ **Project Scope:** Channel Training & Flood Embankment **(Phase 1)**

✔ **Total Project Cost:** US\$ 69.242 million

✔ **Economic Efficiency**

B/C Ratio	NPV (US\$ Million)	EIRR (%)	Remark
2.00	42.182	19.3	

✔ **Project Benefits**

Items	Project Benefits (US\$ million)	Remark
Navigation improvement	30.5 (36%)	
Land loss prevention	1.2 (1%)	
Flood prevention	52.9 (63%)	A = 6,821 ha
<b>Total</b>	<b>84.6 (100%)</b>	

✔ **Project Financing**

✔ **The Project at Phase 1** is characterized by **high public concern** and **long term beneficial**.

✔ **ODA** such as EDCF from Korea Eximbank is **competently recommendable**.

# III. Project Impacts & Compliances

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# 1 Project Impacts

## ✔ Positive

- ✔ Secure Safe Ship Navigation
- ✔ Secure Safe Living and Improve Living Conditions
- ✔ Promote Touring Attraction
- ✔ Activate Local Economics



## ✔ Negative

- ✔ Inevitable Resettlement of Affected Persons



### ☑ **Water-related Hazards and Climate Change**

- ✓ Increasing water-related hazards such as flood and erosion damages in the Ayeyarwady Delta area with global climate change
- ✓ To secure safe living in residential area and farmland and to improve living condition by prevention of land loss & tidal flood along the Twante Canal

### ☑ **Water, Sanitation & Hygiene**

- ✓ To provide fresh water for drinking, cooking, and personal hygiene to residents in Dala, Twante, and Khanaungto Townships

### ☑ **Water and Ecosystem**

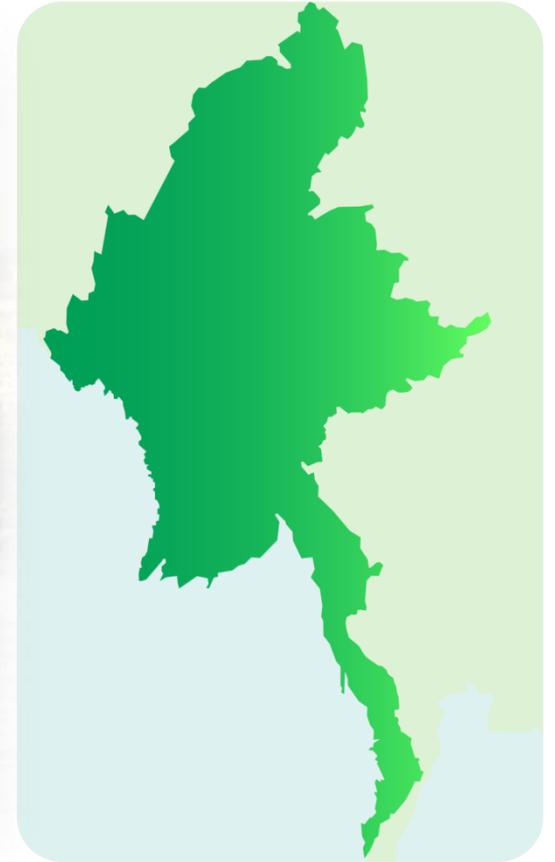
- ✓ (Phase 1) to design river facilities to minimize negative effects on ecosystem in the Twante Canal
- ✓ (Phase 2) to optimize new fresh-water ecosystem in the Twante Canal

### ☑ **Water Security and Urbanization**

- ✓ To secure sufficient fresh water resources for new urban development in Dala, Twante, and Khanaungto Townships

### ☑ **Water and Food**

- ✓ To desalinize irrigable area around Twante Canal
- ✓ To meet growth rate of agricultural demand on fresh water resources



**THANK YOU VERY MUCH!**