World Water Day 2017 Celebration

Twante Canal Integrated Management Project in Myanmar

14 March 2017

ISAN Corporation

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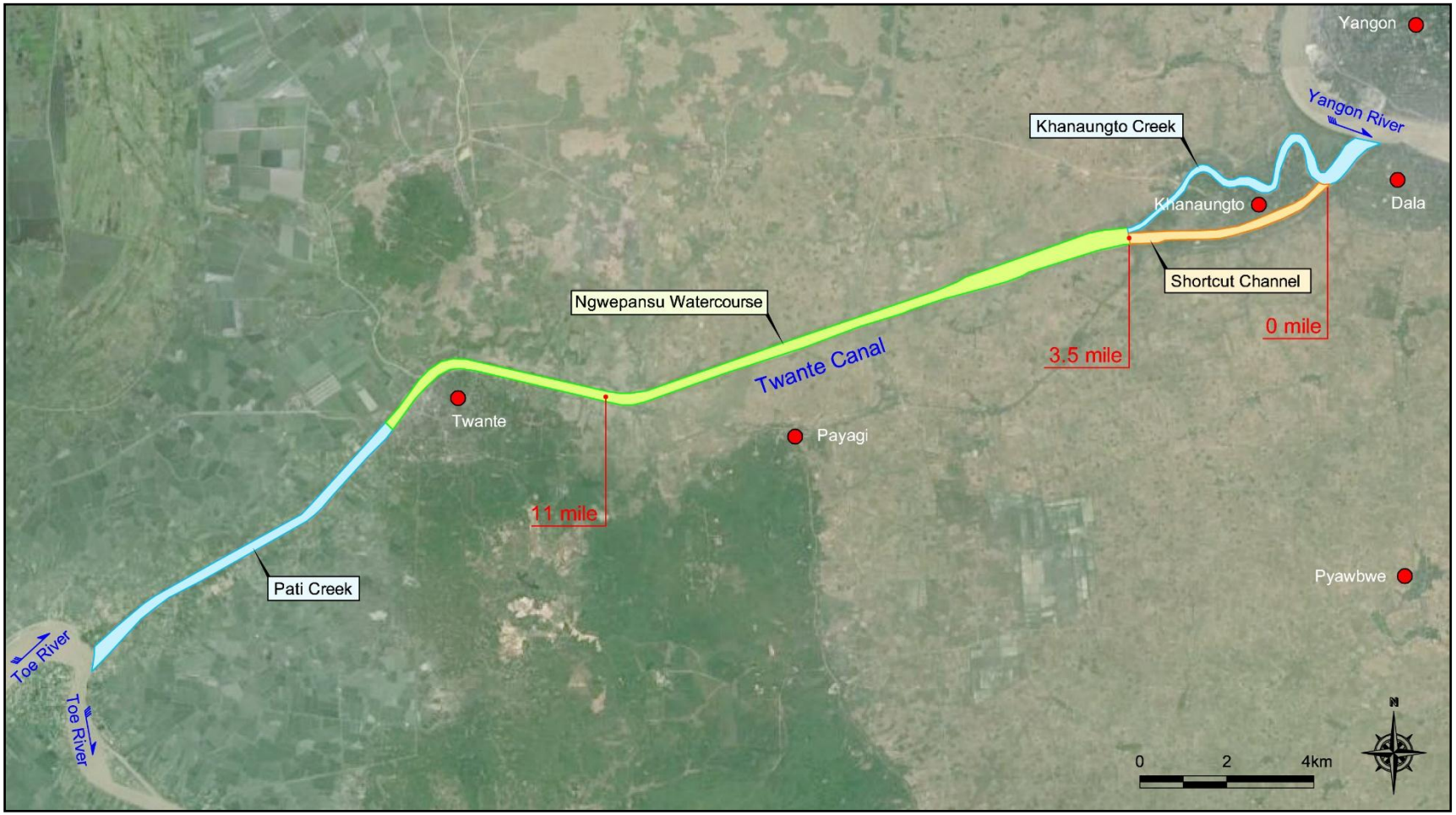
I. Project Rationale

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.

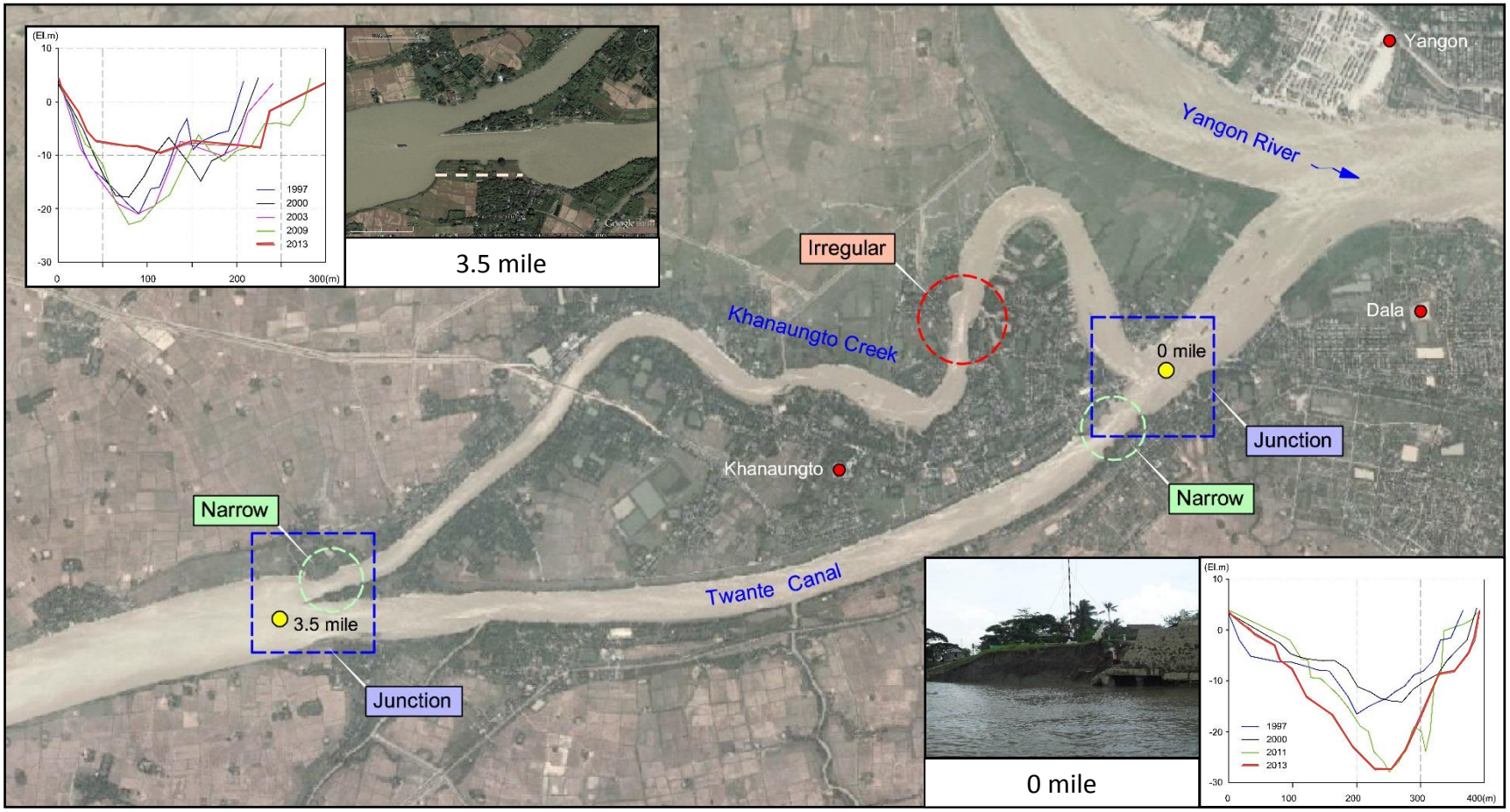
Project Rationale

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)

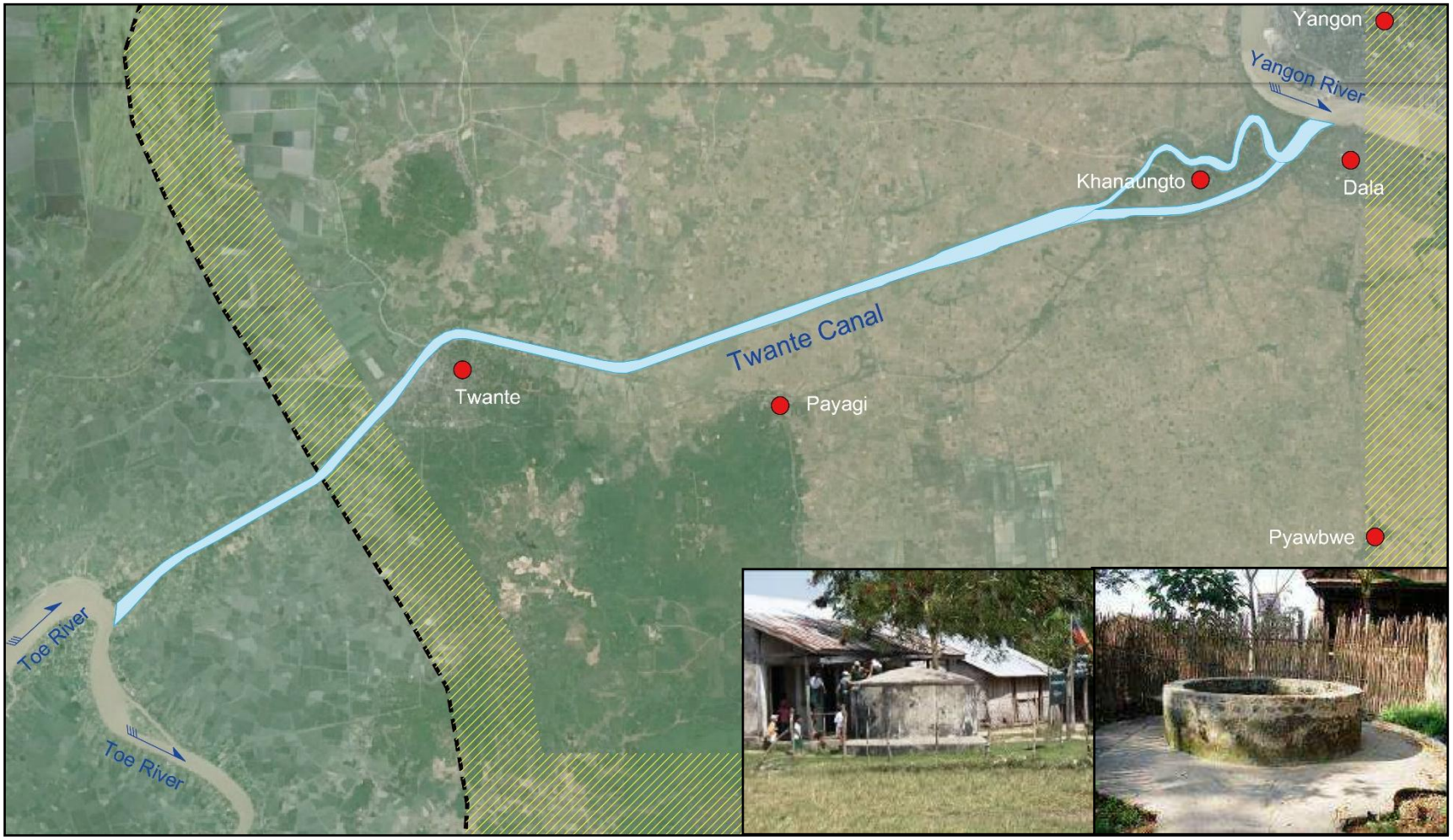


- **High-speed current** due to **tidal effect** (v_{max} ≈ 3.5 m/s during ebb tide)
- **Serious bed and bank erosion** at the junctions
  - ✔ Damage of bank protection and land loss for residential area and farmland
  - ✔ Threatening the safe ship navigation due to large-scaled eddy generation

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**

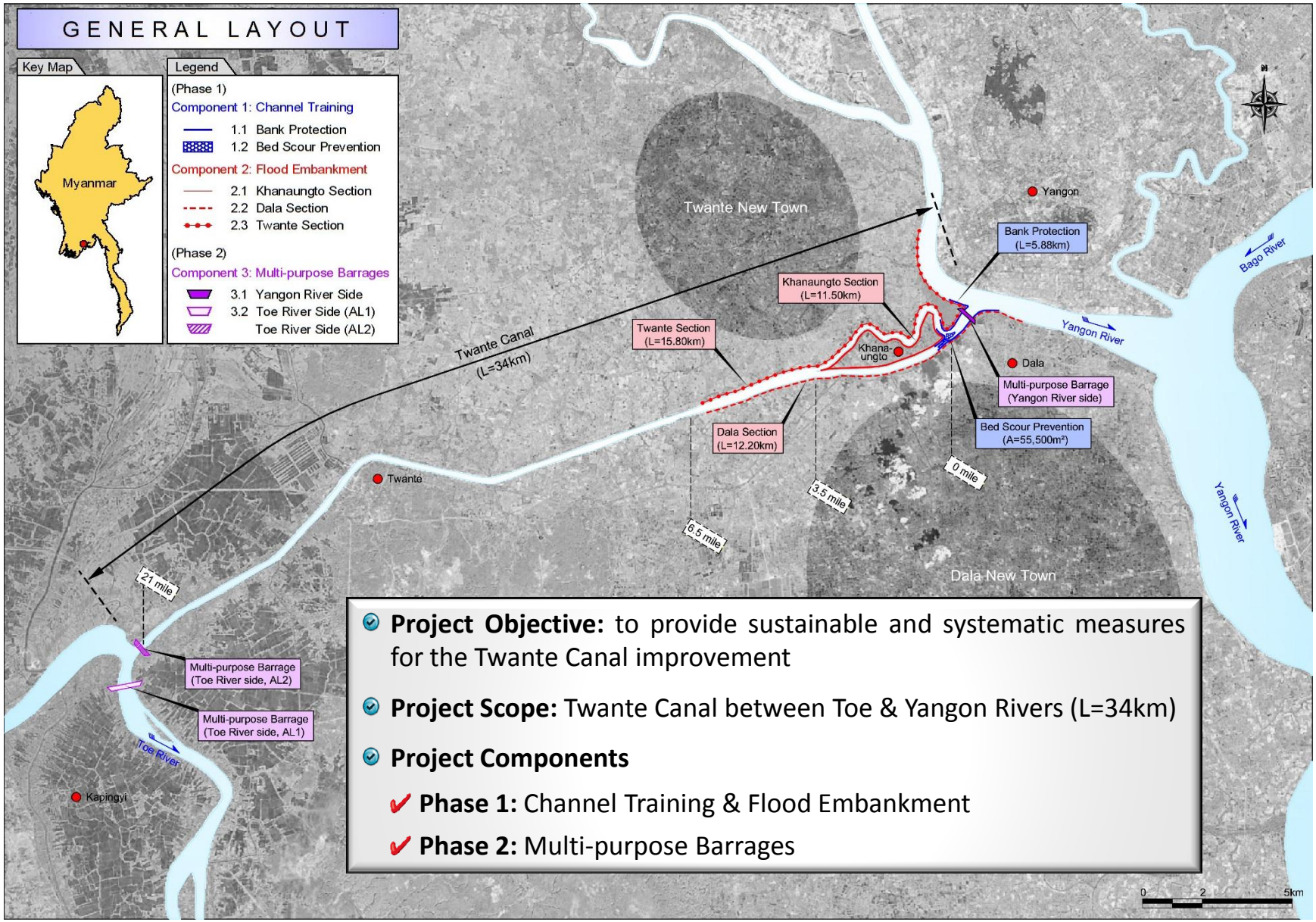
2 Problems & Needs (Saltwater Intrusion)



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

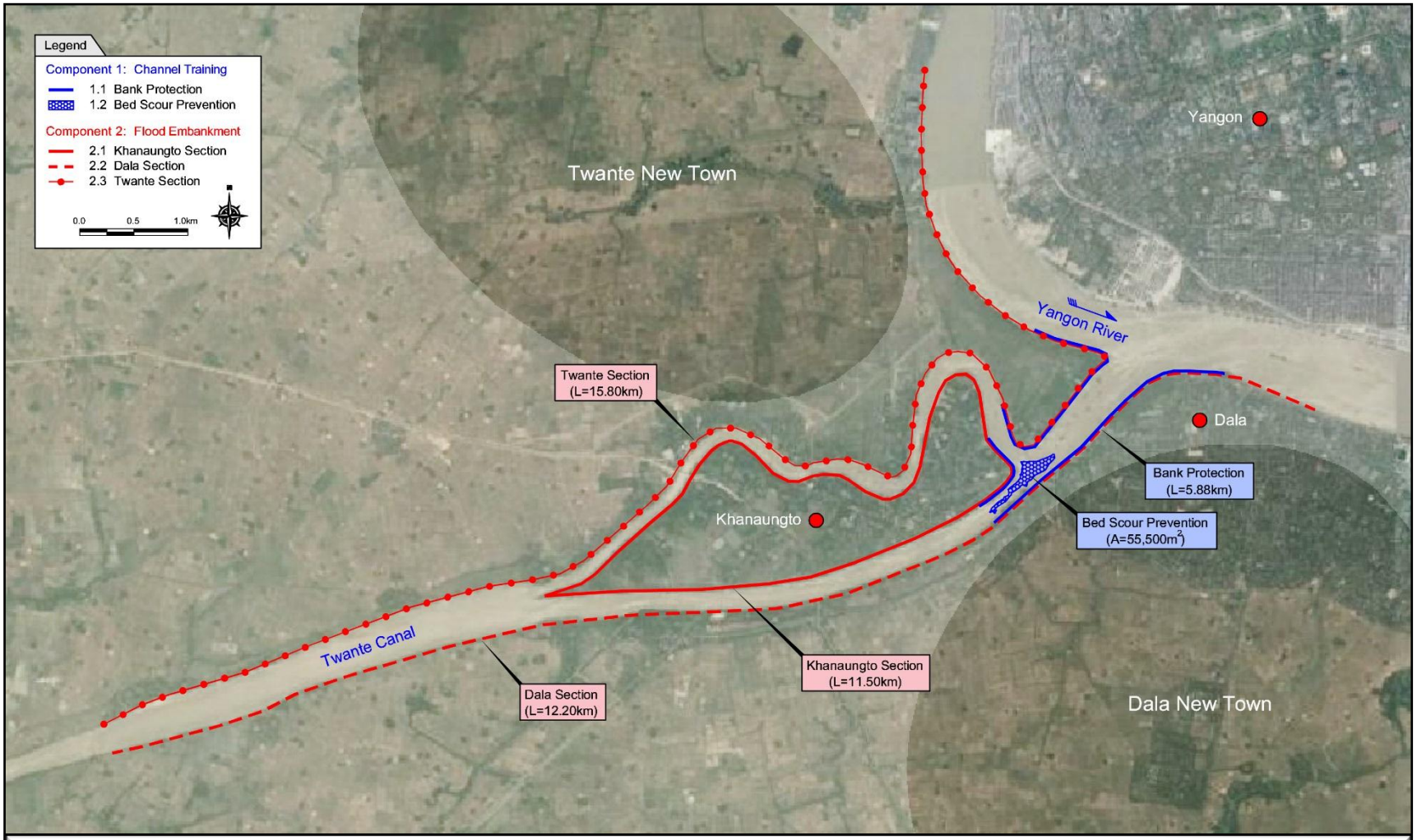
II. Project Proposal

1 Project Outline



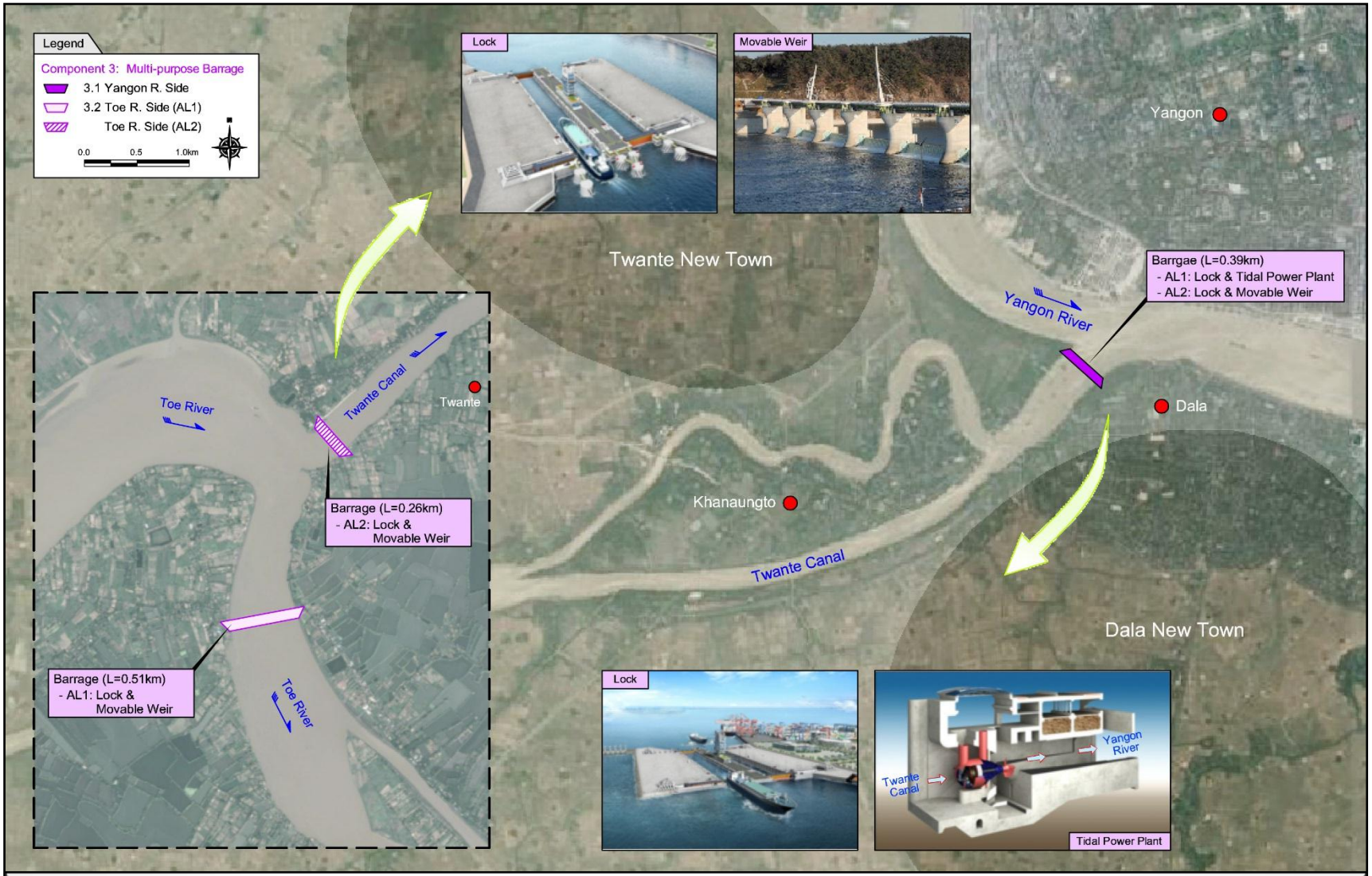
- **Project Objective:** to provide sustainable and systematic measures for the Twante Canal improvement
- **Project Scope:** Twante Canal between Toe & Yangon Rivers (L=34km)
- **Project Components**
  - ✔ **Phase 1:** Channel Training & Flood Embankment
  - ✔ **Phase 2:** Multi-purpose Barrages

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



- **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)



- **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
Cost	**Extreme**	**Moderate**	
Barrage (Toe)	Toe River (L=510m)	Twante Canal (L=260m)	
Barrage (Yangon)	Power plant (high cost)	Movable weir	
Benefits	**Extreme**	**Moderate**	
Water supply	++	+	
Electric power	+	-	
Social & Env. Impacts	**Moderate**	**Expectable**	
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
Total	**84.6 (100%)**	

- **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**.

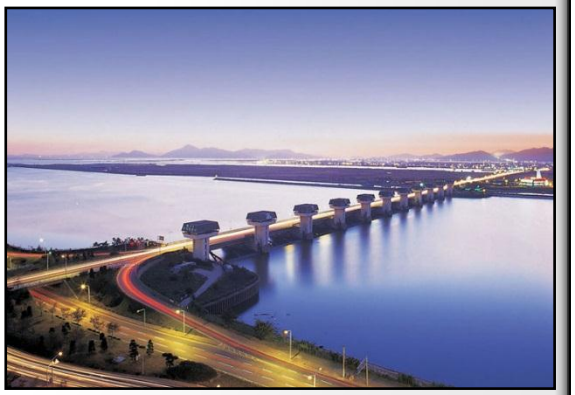
III. Project Impacts & Compliances

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

2 Compliance with UN Water Development Agenda

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!