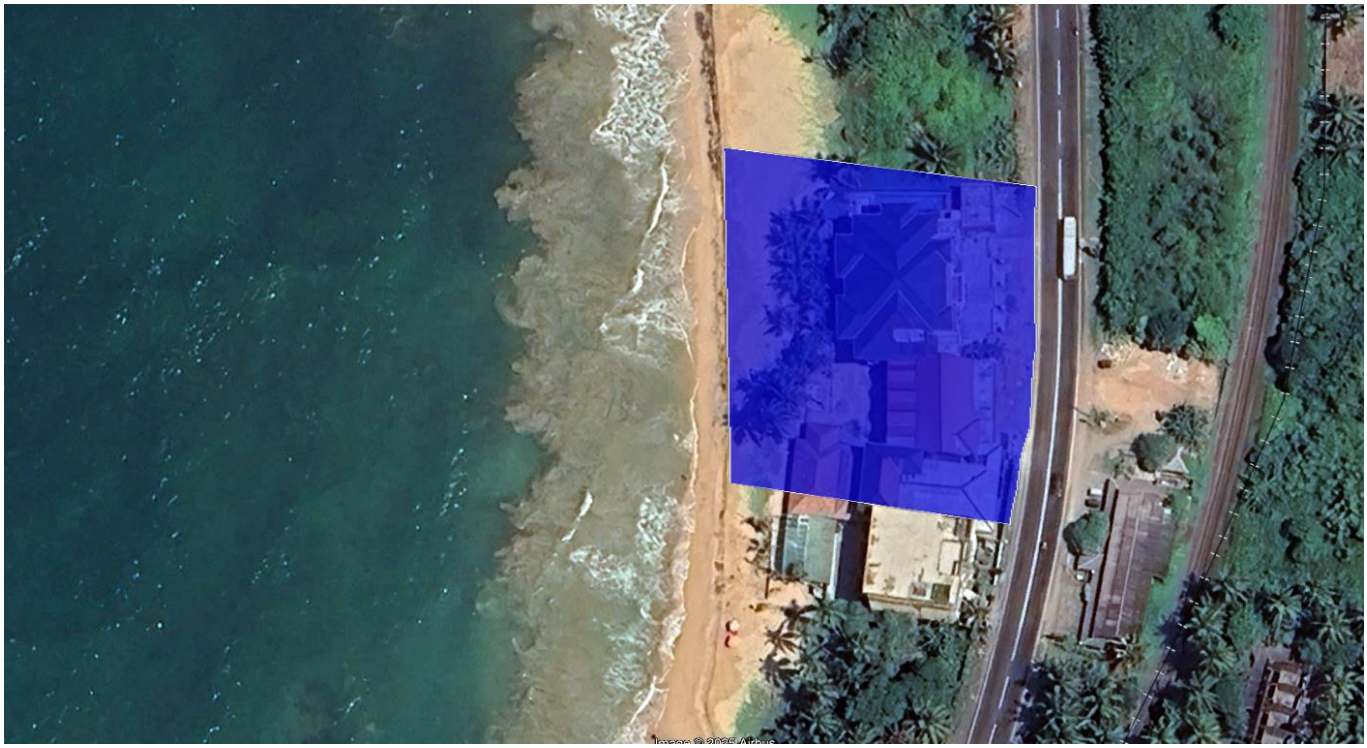
CoastalEdge

Coastal Land Assessment Report



Dear Sir/Madam,

We are pleased to submit the **Coastal Land Assessment Report** for the selected beachfront land parcel. This report has been prepared by CodeRunner Solutions using a combination of satellite imagery, digital elevation models, and field-referenced datasets to provide a comprehensive evaluation of the site.

The analysis covers key coastal parameters including:

- **Beach width variations** under tidal conditions
- **Elevation and flood risk assessment**
- **Sand quality and beach characteristics**
- **Wind conditions and seasonal climate factors**
- **Sea depth profile**

Our findings indicate that the parcel holds strong potential for sustainable development, with favorable natural conditions such as safe elevation, attractive beach quality, natural ventilation from coastal winds, and more.

We trust this report will be a valuable resource in your professional evaluation and decision-making. Should you require further clarifications, detailed data outputs, or additional site-specific modeling, we would be happy to provide continued support.

Thank you for the opportunity to collaborate on this important assessment.

Sincerely,
CoastalEdge Team.

CoastalEdge

Coastal Land Assessment Report – Induwara Beachfront Parcel

Client Selected Plot: Induwara Coastal Zone, Southern Sri Lanka

Prepared by: CodeRunner Solutions

Date: October 31, 2025

1. Beach Width Analysis

Beach width refers to the horizontal distance from the back of the beach to the water's edge, and it varies based on the tidal stage. A wide beach during low tide offers more usable space for recreation or development.

Narrower widths at high tide may limit access or expose land to waves. Evaluating beach width under both tidal extremes helps assess the long-term stability and usability of coastal property. Seasonal and annual variations can indicate ongoing erosion or accretion patterns.

Tidal Condition	Beach Width (m)
Low Tide	Maximum: 46 m
High Tide	Minimum: 14 m

✅ Interpretation:

- At **low tide**, the beach is **wide and spacious**, up to **46 meters** in some areas.
- At **high tide**, the beach becomes much narrower, sometimes only **14 meters wide**.

What this means:
The land has a beautiful, wide beach most of the time, perfect for relaxation and activities. However, during high tide, the beach space close to the water reduces, so buildings should not be placed too close to the shore.

Data Source:

Beach width analysis is done using Google imagery data going back to 2014.

2. Elevation & Flood Risk

A 3D elevation map represents terrain elevation in three dimensions, showing the relative height of land above sea level. It helps assess the flood vulnerability and drainage potential of coastal land.

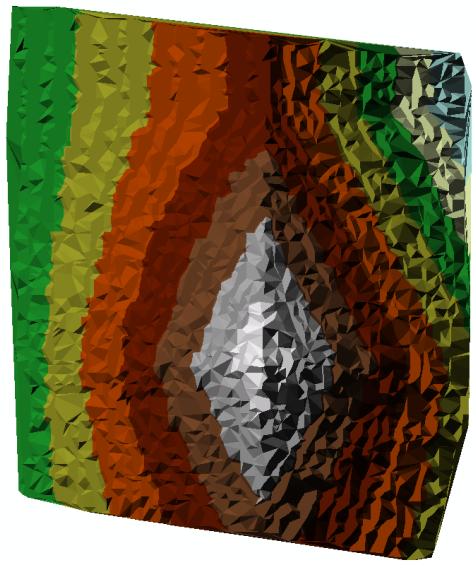
Using elevation models like DEMs and TINs, one can visualize the slope, ridges and low-lying areas. This is important for safe building placement and understanding how water may accumulate or flow.

High elevation offers natural protection against storm surges, sea-level rise and heavy rainfall events.

3D Terrain Analysis:

- A 3D model shows that the land is **at a safe height**, not in a known flood-risk area.

What this means:
The land is generally **safe from flooding** during normal weather and tides.



✅ Flood Risk:
The plot is not within a known flood-prone zone and appears safe under normal weather and tidal conditions.

Data Source:

Elevation and flood risk is done using the most recent Google Digital Elevation Model (DEM) data available.

3. Sand Quality & Beach Type

Observation Method: Google Street View & Satellite Imagery

✅ Implication:
The sand is **like in the image below**, which is ideal for tourism and beach lovers.

Data Source:

Sand Quality and Beach Type identification is done using the most recent Google Maps imagery and view points.

4. Wind Conditions & Climate

Wind speed analysis studies the average and peak wind intensity at a location throughout the year. This is important for construction standards, user comfort and potential wind-related erosion. Coastal areas in Sri Lanka experience monsoonal winds, with varying strength and direction. Understanding wind patterns ensures structures are well-ventilated but also wind-resistant. Data is sourced from historical models, reanalysis datasets or APIs.

General Wind Behavior:

- From **May to September** (Southwest Monsoon), the area gets **strong winds** from the sea.
- From **December to February** (Northeast Monsoon), the winds are **gentle and mild**.

What this means:
The natural winds help keep the area cool, but any buildings should be strong enough to handle occasional strong winds.

✅ Implication:
Winds are favorable for natural ventilation and cooling, but some structural wind resistance should be planned in building design.

Data Source:

Wind conditions and climate analysis are done using the Sri Lanka Meteorological Department's data.

5. Sea Depth Profile

Sea depth profile reveals how quickly the seabed deepens from the shoreline, which influences wave behavior and flood potential.

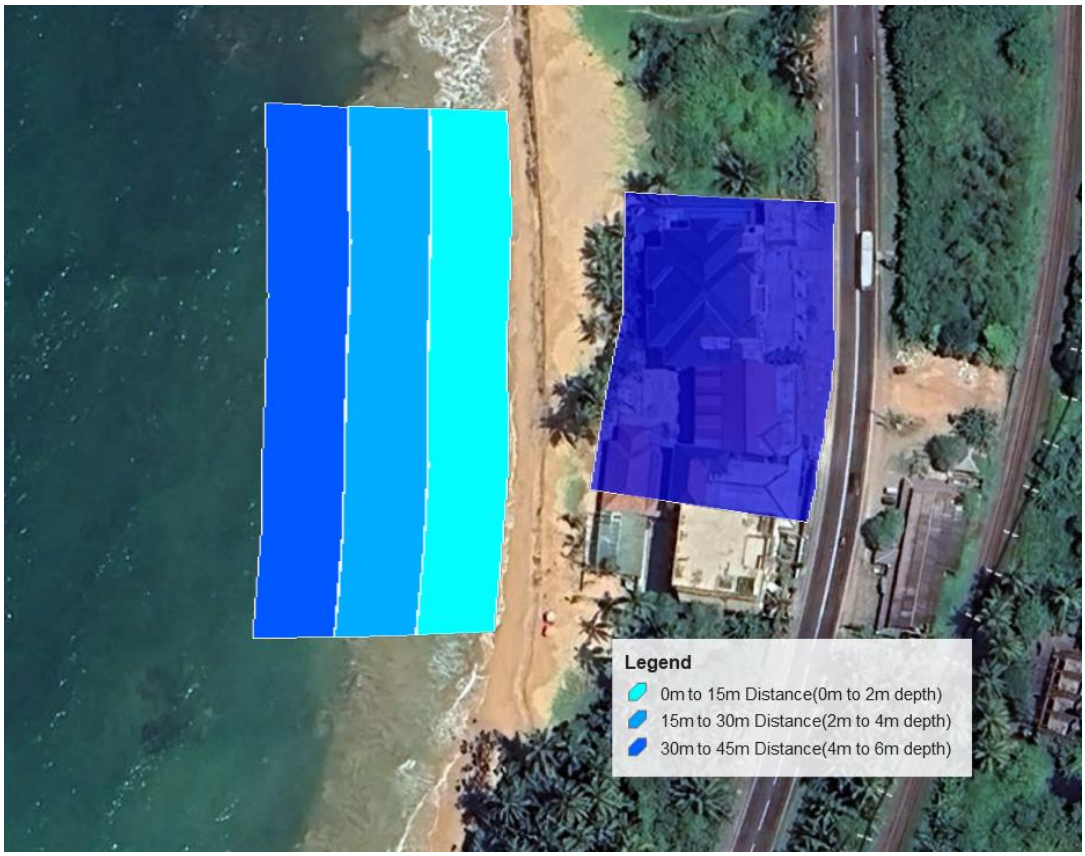
This is essential for understanding coastal erosion risk and marine construction feasibility. Shallower, gradual seabeds are generally safer and more stable for nearshore activities.

✅ Implication:

- The **sea near the beach gets deeper gradually**, without sudden drops.
  The gentle sea depth is **good for swimming and beach activities** and helps reduce the impact of waves during storms.

Data Source:

Sea depth profile analysis is conducted using official surveyed bathymetric data acquired from a hydrographic institute when available. If unavailable, satellite-derived bathymetry data is applied based on water depth and data availability.



Conclusion

This land in Induwara is a **great choice for development** due to:

- A **beautiful and wide beach** (especially at low tide)
- **Safe land level**, not prone to floods
- **Attractive sand quality**
- **Natural cooling winds**
- **Safe swimming conditions**