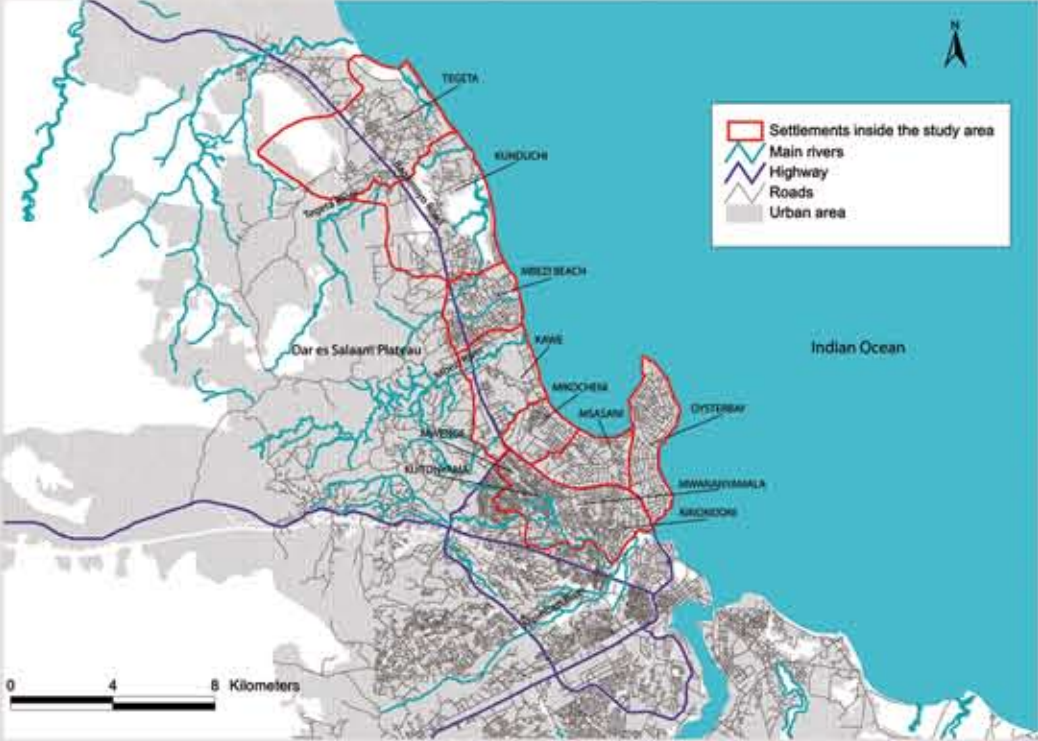
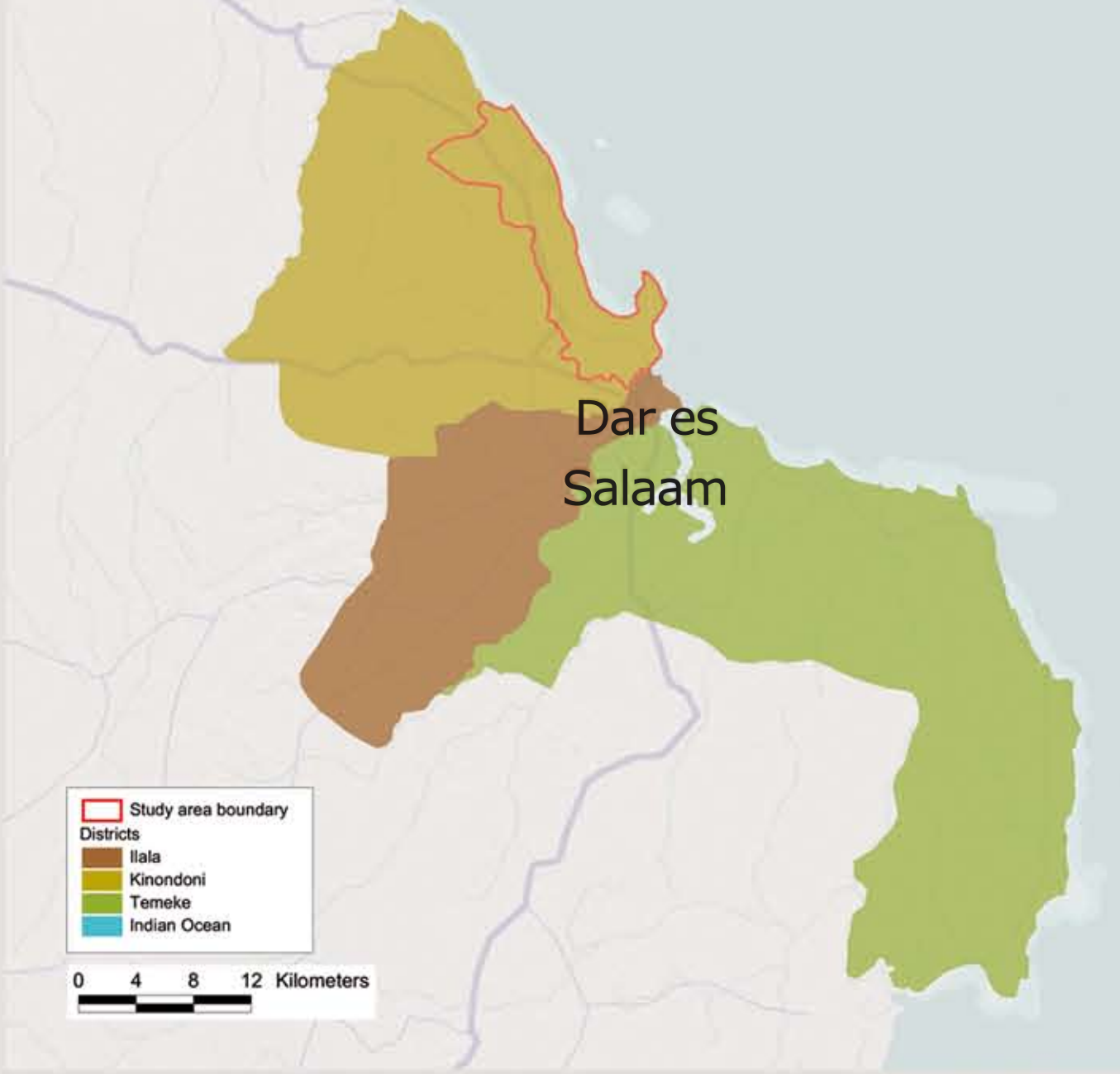


STUDY AREA LOCATION

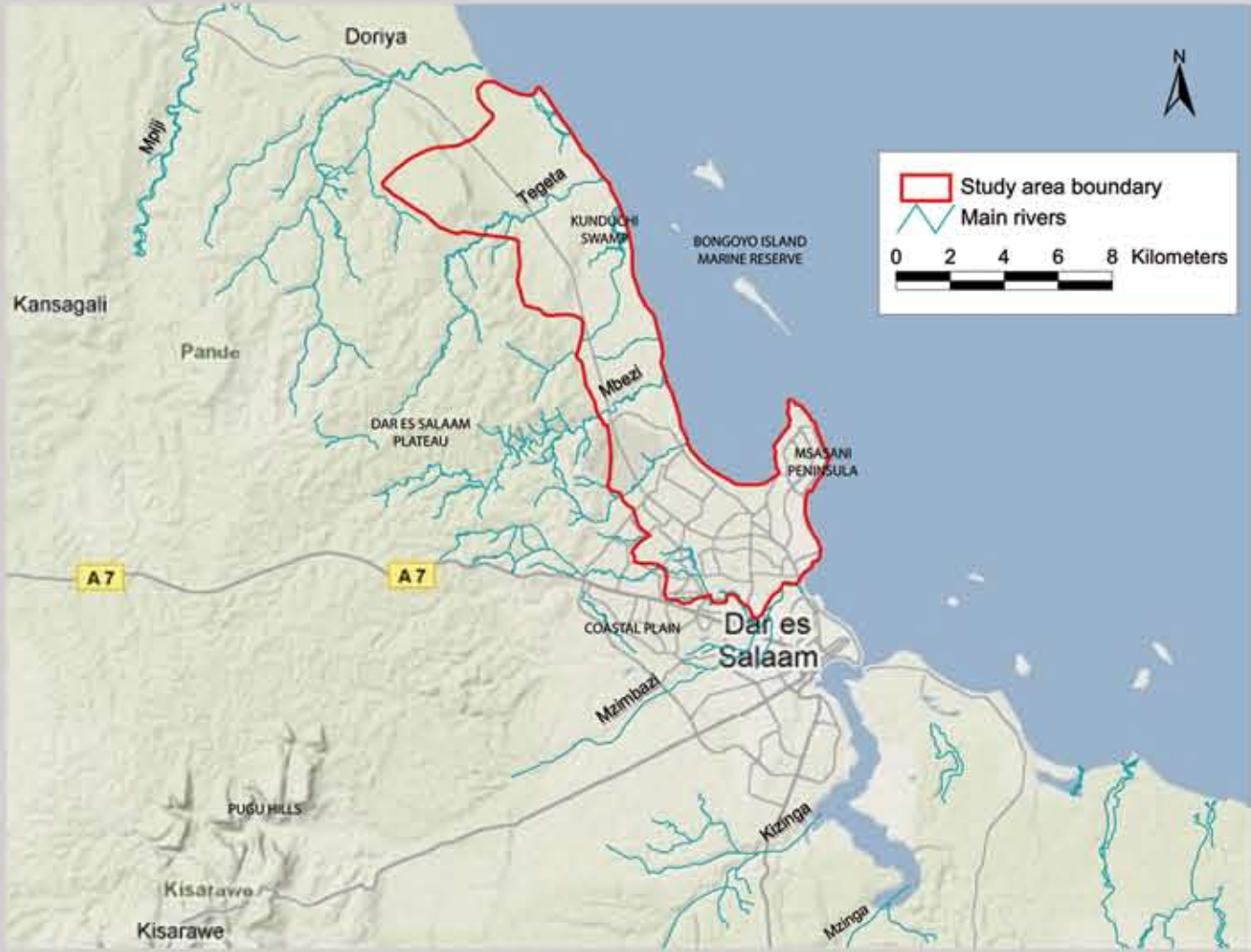


Dar es Salaam (دار السلام, "house of Peace" in Arabic), where the study area is located, is the largest city in Tanzania as well as its economic centre and primary port. It is located on a natural bay on the Indian Ocean between the islands of Zanzibar and Mafia. The bay extends 100 km from the Mpigi River to the north past the Mzinga River to the south, at a latitude between 6°36' and 7° south and a longitude between 39° and 33°33' east. It has an area of roughly 1400km² and a population of approximately 3 million inhabitants, with an annual growth rate of 4.39%, the fourth highest in Africa and ninth in the world.

The study area is located entirely within the Kinondoni district and includes parts of the urban areas of Kinondoni, Oysterbay, Msasani, Mikocheni, Mwananyamala, Kijitonyama, Mwenge, Kawe, Mbezi Beach and the more peripheral areas of Kunduchi and Tegeta. It has an area of approximately 100 km², extends along a 29 km stretch of coastline to the north of the centre of Dar es Salaam and is bordered to the east by the Indian Ocean. The western boundary of the area is the Dar es Salaam Plateau, which rises west of the Ocean along the entire study area. The southern boundary corresponds to the last segment of the Msimbazi River which runs through the coastal plains before flowing into the Indian Ocean to the south of the Msasani Peninsula, while the northern boundary is located just north of the Tegeta River.



GEOMORPHOLOGY AND HYDROLOGY

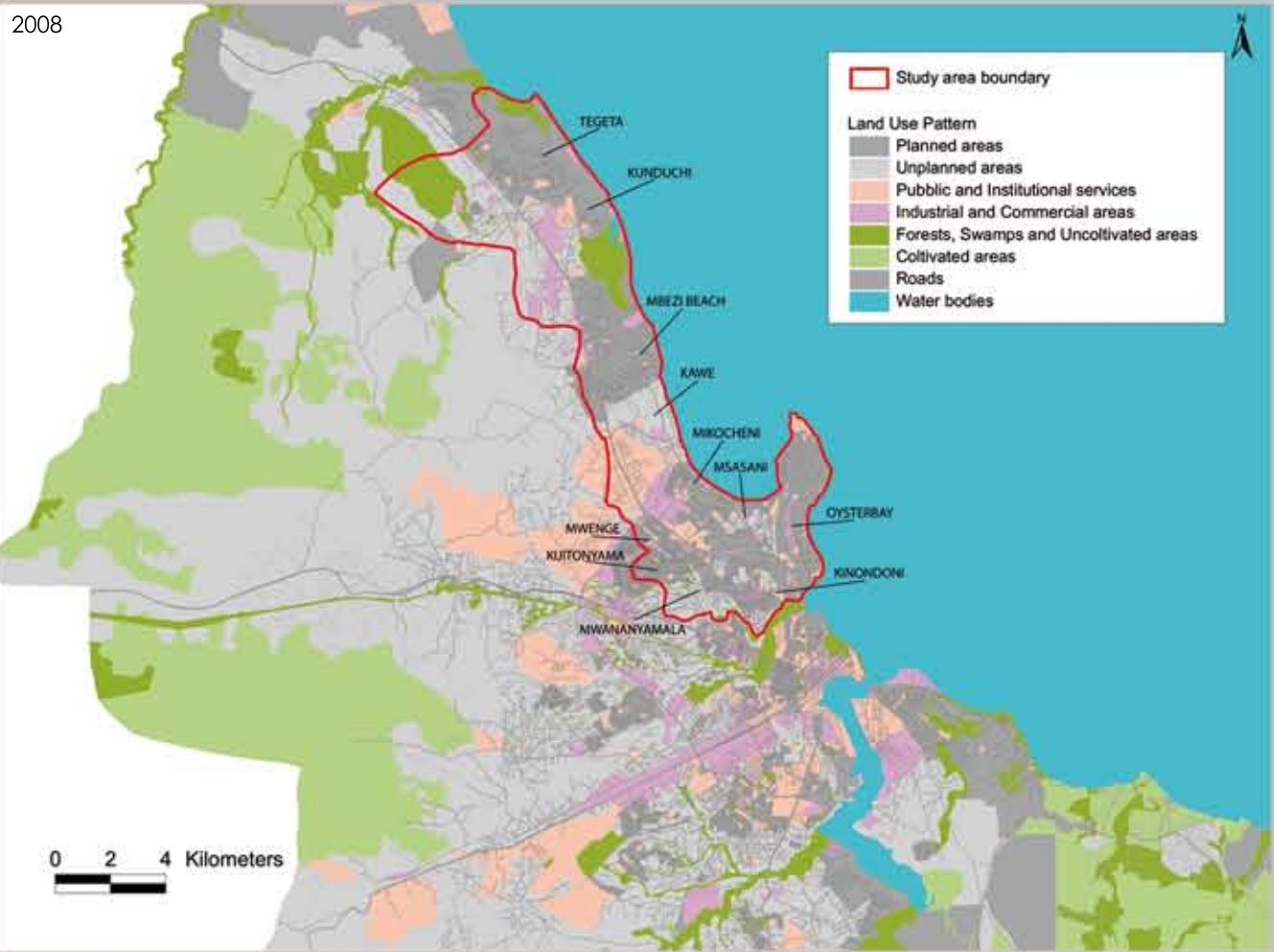


The following geomorphologic features are found within the Dar es Salaam Region and the study area:

- The coastal zone, which is tightly bordered by the Indian Ocean and the Coastal Plain and characterized by beaches with sandy dunes and tidal plains. With respect to the study area, the beach extends almost continuously from the northern foot of the Msasani Peninsula, which consists mainly of calcareous cliffs of coral origin, down to the silt clay Kunduchi lagoon.
- The sandy Coastal Plain which spans the central area of Dar es Salaam from the coast towards the west, rising from 0 m to 60 m above sea level with a gradient varying from 0% to 5%. The plain is relatively flat and lined with numerous wide U-shaped fluvial valleys which are delimited by fairly steep embankments and culminate in inlets or mangroves before flowing into the Indian Ocean.
- A hilly area of medium altitude (the Dar es Salaam Plateau) which extends to the north-west and south-east limits of the city, between the coastal plain and the Pugu Hills. It has an altitude of between 60 m and 160 m, with a gradient from 2% to 8% in the north-west area and between 2% and 6% in the south-east area.
- The large outcropping of kaolinic sandstone, which constitutes the deeply divided V-shaped Pugu Hills, characterized by the steep slopes that surround the city to the west. They have an altitude varying from 120m to 330m, with a gradient of over 6%.

The hydrological system within the urban area of Dar es Salaam includes four main rivers, namely the Mzinga, Kizinga, Msimbazi and Mbezi Rivers, as well as several other minor seasonal waterways. In particular, within the study area run two main rivers: the Msimbazi River, in the of south of the Msasani Peninsula, and the Mbezi River, in the Kawe area, as well as several minor waterways, the most important of which is the Tegeta River which runs through the Kunduchi area.

LAND USE

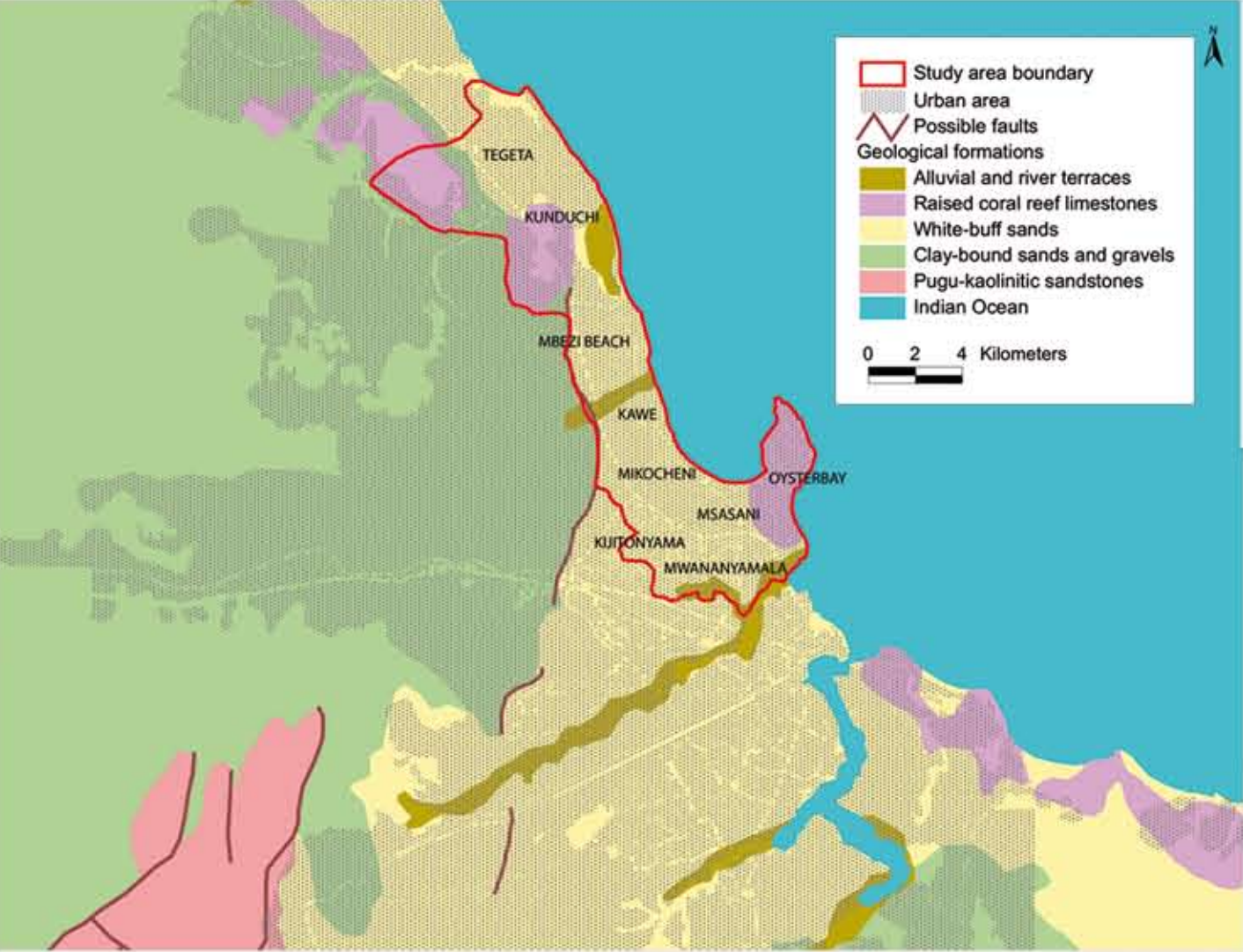


For the last 20 years the city has been experiencing rapid demographic expansion, which has caused uncontrolled development of the urban fabric (extended peri-urban areas), the proliferation of informal settlements and the deterioration of public services. The study area presents various characteristics of land use. In general, it is possible to differentiate between the areas proximate to the centre of Dar es Salaam, which exhibit typical urban characteristics (residential areas with a prevalence of commercial and industrial activities), and the more peripheral areas, in which the settlements are "immersed" in vegetation and agricultural activities predominate (urban-rural interaction).

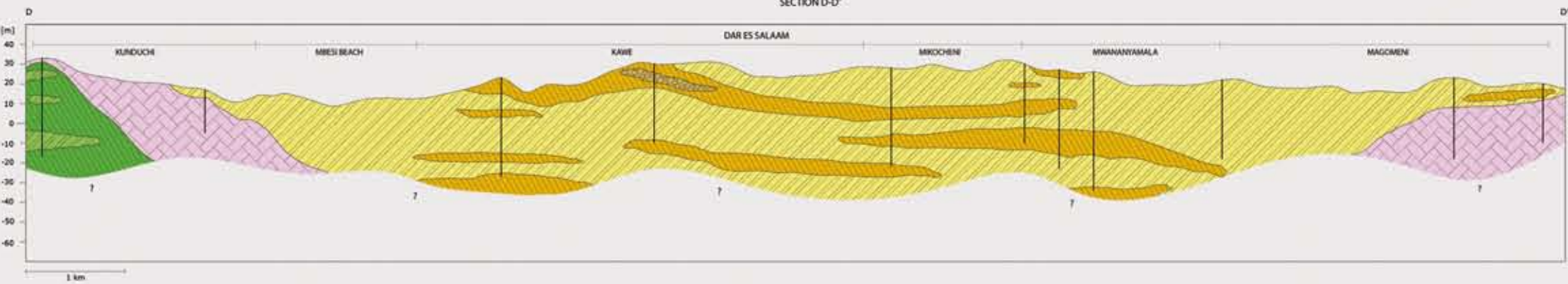
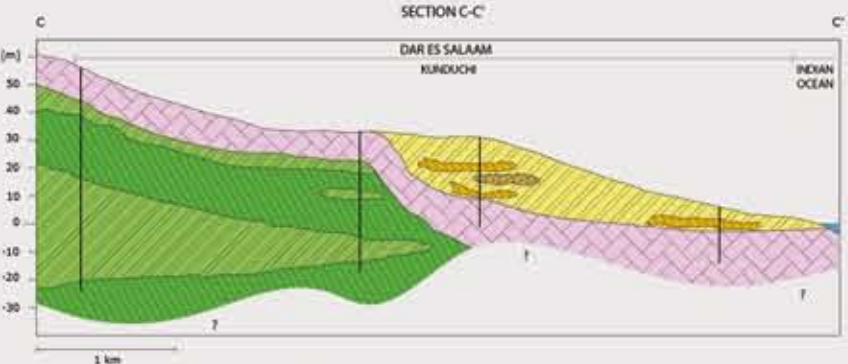
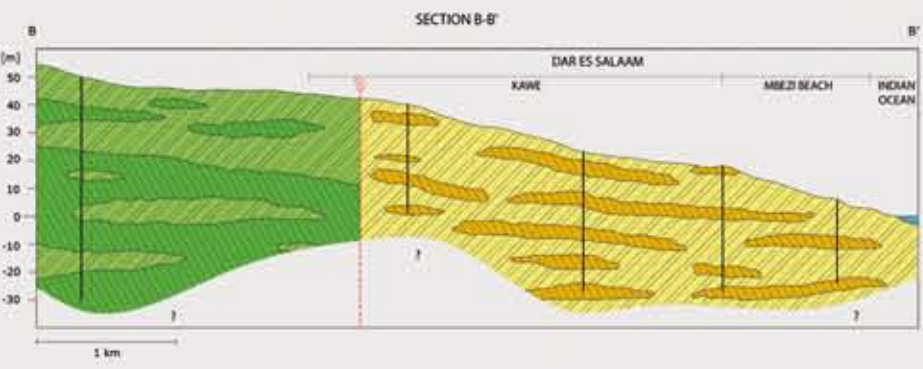
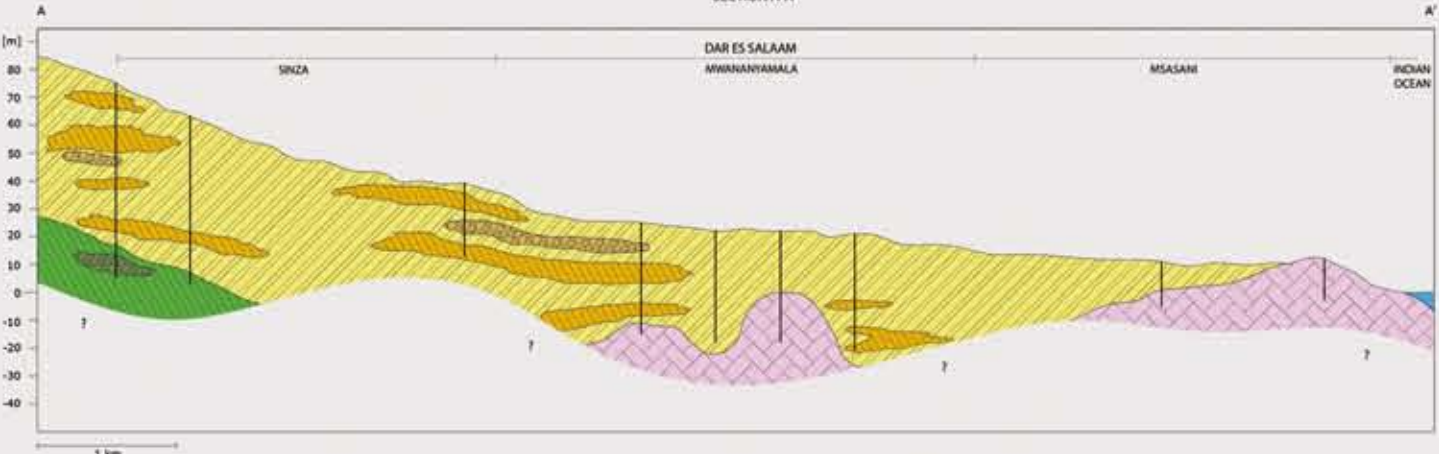
GEOLOGY AND HYDROGEOLOGY

Within the study area the outcropping formations belong to two principle geologic periods: the Quaternary and the Neogene. Formations from the Quaternary are found primarily in the areas near the coast, and fill the tectonic depression which originated in the lowering of formations from the Neogene. Within the study area the Quaternary is evidenced by three different stratigraphic units with heterogeneous characteristics: alluvial deposits, (Pleistocene to Recent, *Alluvial and river terraces*), sandy deposits in the coastal plains (Pleistocene, *White-buff sands and gravels*) and limestone deposits (Pleistocene, *Raised coral reef limestone*).

The alluvial deposits consist essentially of sand, clay and sometimes gravel, and they are found predominantly along the recent alluvial plains of the principle waterways (Mbezi River and Msimbazi River) and in the Kunduchi lagoon. The predominantly sandy deposits consist of sand and white washed gravel, interspersed with clay lenses, and they appear next to the coastal plain within the study area. The limestone deposits consist of coral materials and are located primarily in a narrow strip that widens along the coast. They are generally eroded and covered with white-buff sand, except in the Msasani Peninsula and to the north of Kunduchi, where they appear at the surface. Formations from the Neogene are spread predominantly throughout the central part of the Dar es Salaam bay, on the edge of the sandy coastal plains of the Quaternary. Within the study area, the Neogene is represented by one stratigraphic unit: deposits of undifferentiated material (Mio Pliocene, *Clay-bound sands and gravels*). Those deposits consist of sandy clay interstratified with clay-bound sand, a few pure sand lenses, pure clay and gravel and they extend along the plateau to the edge of the sandy coastal plain.



Geological Sections



For the purpose of defining the geological structure of the territory, 4 geological cross-sections have been reconstructed (AA', BB', CC', DD') through the reading and correlation of 26 stratigraphic surveys. The following hydrogeological reading of the reconstructed sections thus allowed for definition of the hydrogeological pattern of the area under examination.

QUATERNARY (PLEISTOCENE TO RECENT)

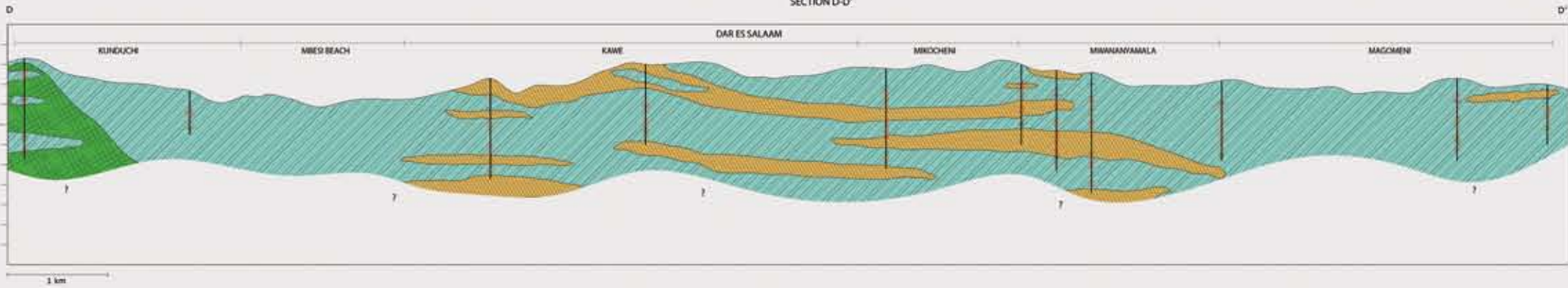
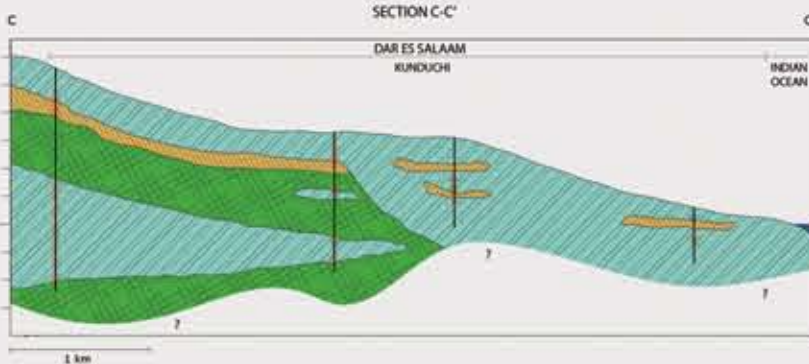
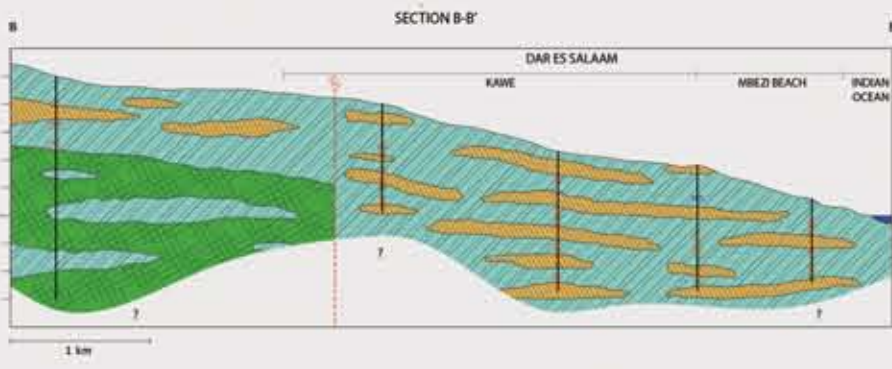
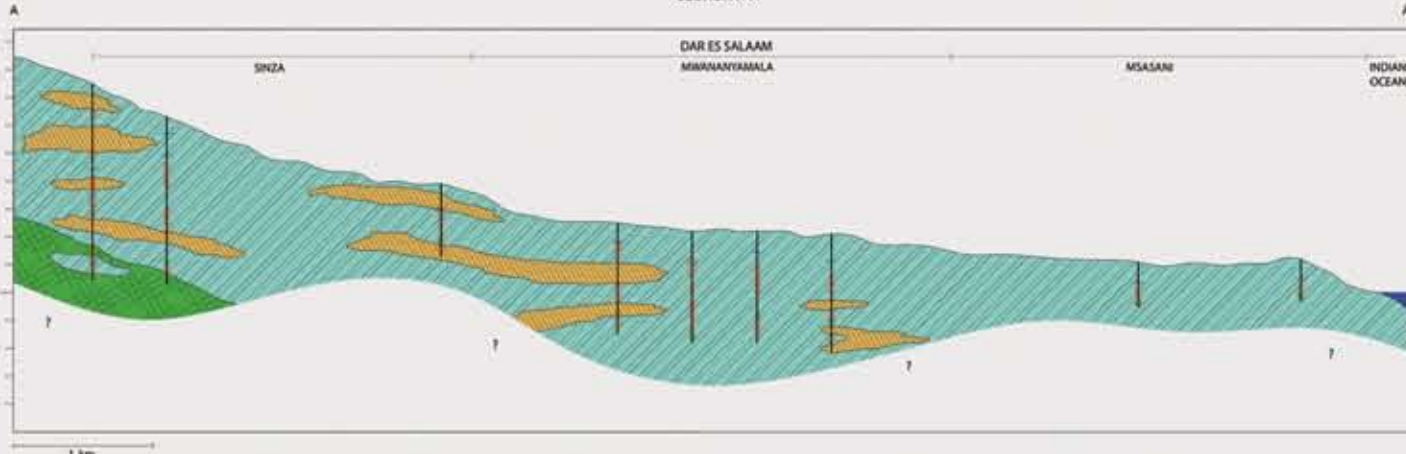
WHITE-BUFF SANDS

RAISED CORAL REEF LIMESTONES

NEOGENE (MIO-PLIOCENE)

CLAY-BOUND SANDS AND GRAVELS

Hydrogeological Sections



AQUIFER FORMATION (gravel, sand, limestone)

AQUITARD FORMATION (sandy clay, clay bound sand)

AQUICLUDE FORMATION (clay)

POSSIBLE FAULTS

WATER TABLE

BOREHOLE SCREEN

BOREHOLE

BOREHOLE PUMP

