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91243R

NZQA
NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

QUALIFY FOR THE FUTURE WORLD
KIA NOHO TAKATŪ KI TŌ ĀMUA AO!

# Level 2 Geography, 2016

## 91243 Apply geography concepts and skills to demonstrate understanding of a given environment

2.00 p.m. Wednesday 16 November 2016
Credits: Four

RESOURCE BOOKLET

Refer to this booklet to answer the questions for Geography 91243.

Check that this booklet has pages 2–10 in the correct order and that none of these pages is blank.

**YOU MAY KEEP THIS BOOKLET AT THE END OF THE EXAMINATION.**

## Relevant geographic concepts

**Environments**

Environments may be natural and / or cultural. They have particular characteristics and features, which can be the result of natural and / or cultural processes. The particular characteristics of an environment may be similar to or different from another. A cultural environment includes people and / or the built environment.

**Interaction**

Interaction involves elements of an environment affecting each other and being linked together. Interaction incorporates movement, flows, connections, links, and interrelationships, which work together and may be one-way or two-way interactions. Landscapes are the visible outcome of interactions. Interaction can bring about environmental change.

**Change**

Change involves any alteration to the natural or cultural environment. Change can be spatial and / or temporal. Change is a normal process in both natural and cultural environments. It occurs at different times and in different places. Some changes are predictable, while others are unpredictable. Change can bring about further change.

**Sustainability**

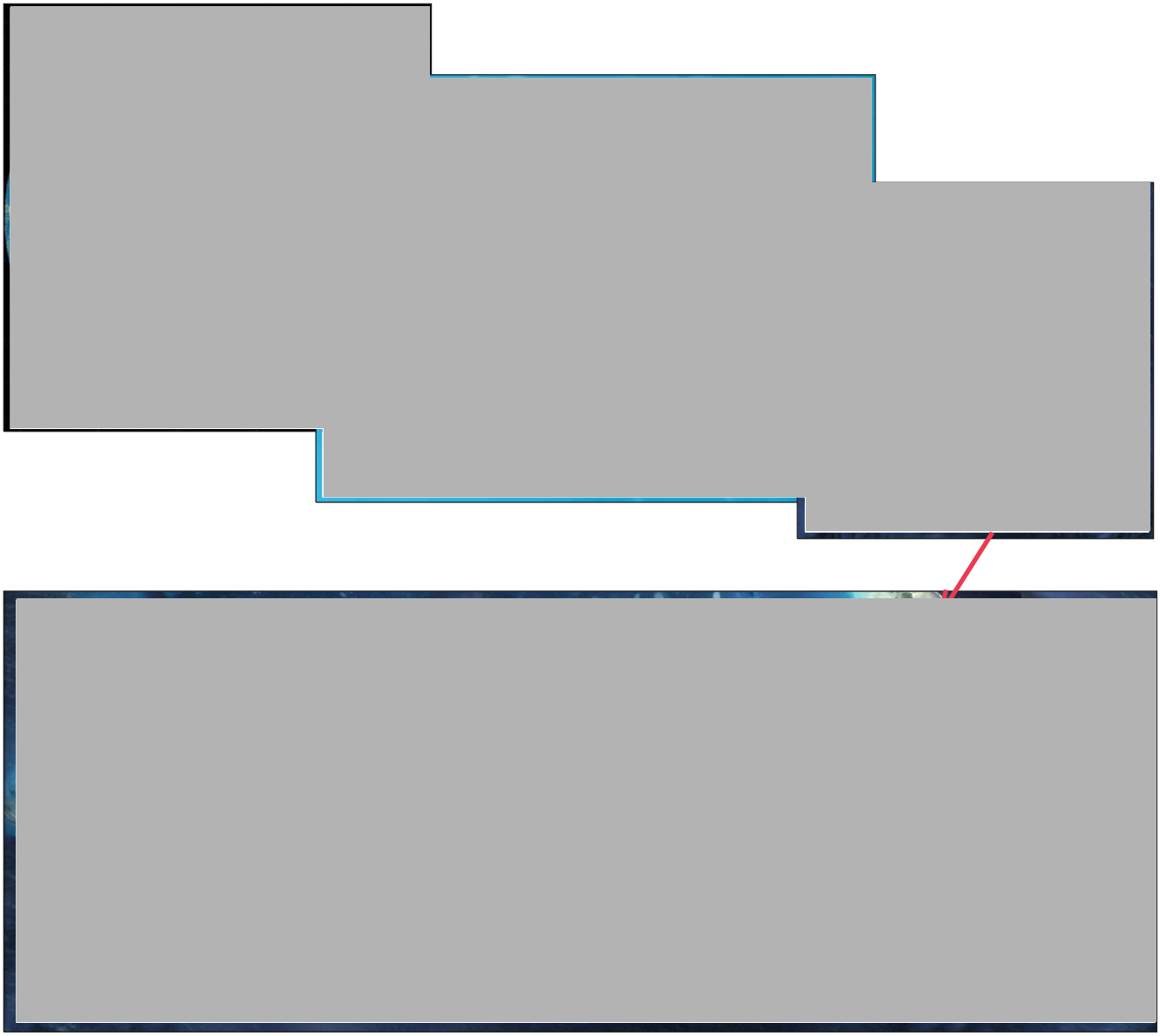
Sustainability involves adopting ways of thinking and behaving that allow individuals, groups, and societies to meet their needs and aspirations without preventing future generations from meeting theirs. Sustainable interaction with the environment may be achieved by preventing or minimising environmental damage to water, air, and soil, as well as considering problems related to waste and visual pollution.

# BACKGROUND TO SOUTH TARAWA, KIRIBATI

## Introduction: Where is South Tarawa?

Kiribati (pronounced *Kiri-bas*) is the most remote, as well as one of the smallest countries in the world. The total land area of Kiribati's 33 atolls is just 800 square kilometres. It lies on the equator, and is spread over an area of 3.5 million square kilometres of the central Pacific Ocean.

Kiribati's main international airport and deep-water seaport are located on South Tarawa, which has developed as the business and administrative centre for the country.



# THE ENVIRONMENT OF SOUTH TARAWA

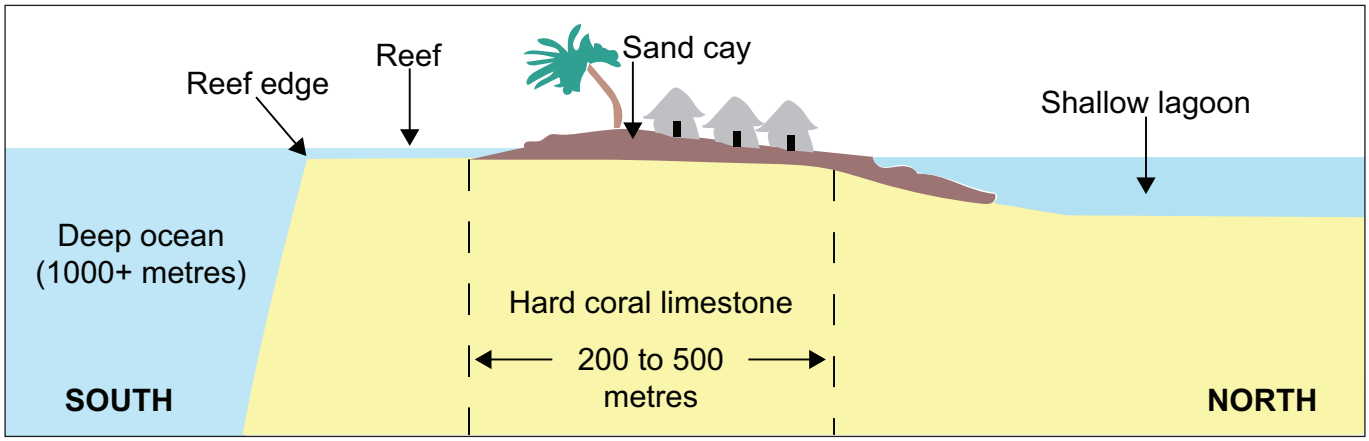
## Resource A: Coral atolls and sand cays

An **atoll** is a ring-shaped **coral reef** that sits atop an extinct volcano or seamount that has eroded or subsided beneath sea level. The coral reef is made of limestone formed from the remains of dead coral polyps (a small organism), which survives in shallow tropical water.

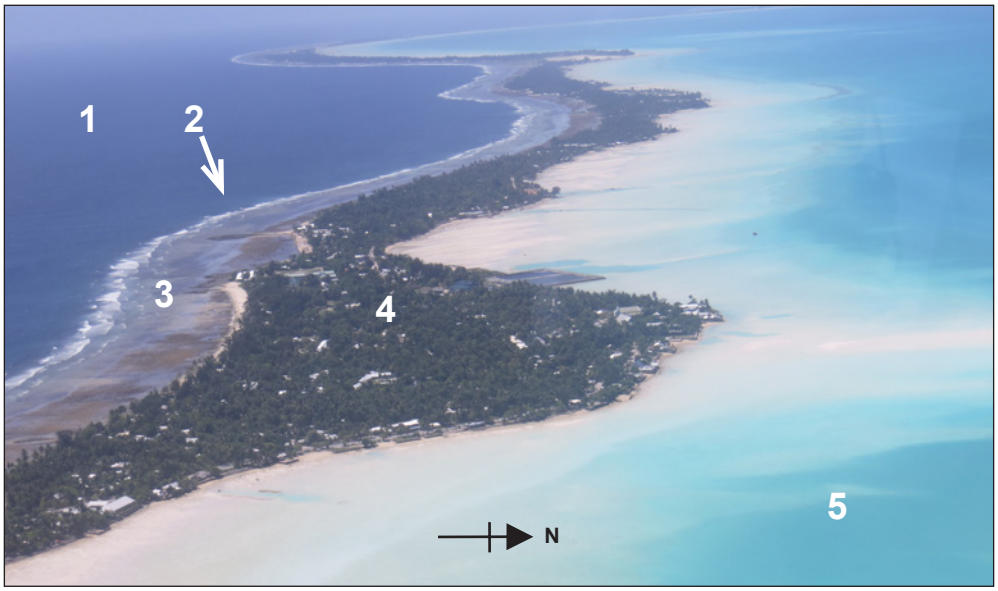
Depending on the prevailing wind and waves, the **sand cays** are formed by wave and wind deposition. The cays – often no more than two metres above sea level – form around the outside rim of the reef, and encircle a shallow **lagoon**.

The sea surrounding the atolls is usually deep, with the coral reef dropping sharply away at the **reef edge**, to 1 000 metres or more.

## Resource B: Simplified cross section of a sand cay




## Resource C: View of South Tarawa looking westward

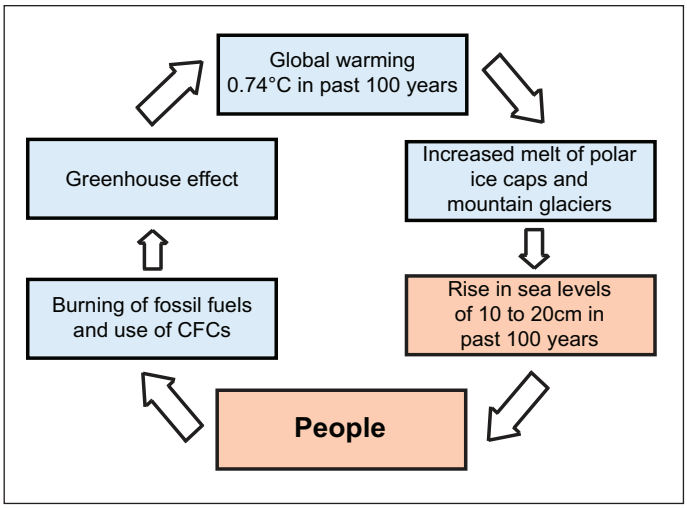


**Resource D: Google Earth image of Betio Island, South Tarawa (2014)**

**Resource E: Oblique photo of Betio Port, South Tarawa, looking north (2010)**

# INTERACTION IN SOUTH TARAWA

## Resource F: Global warming and sea level rise in affecting South Tarawa

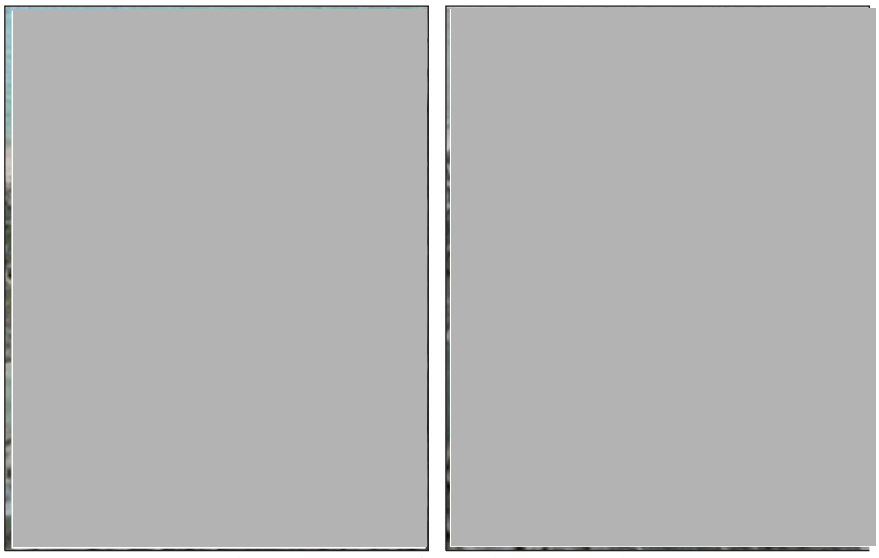



Global cause of rise in sea level

World sea level rise

Abaroa, South Tarawa, at high tide. The rise in sea level has killed mature coconut trees.

The sea wall in Abaroa is all that protects the houses from flooding during a king tide.



Abaroa 2005 (left) and 2014 (right).
The inundation of sea water has led to erosion and the loss of houses and productive land.

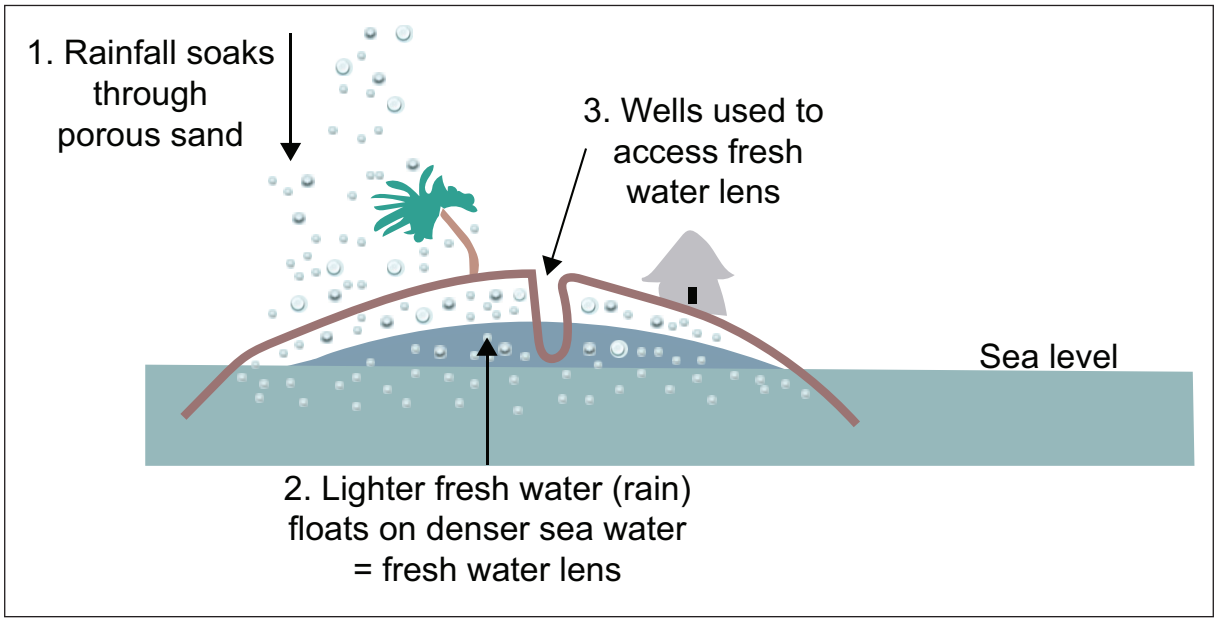
## Resource G: The impact of people on water resources (water lens)

The traditional source of water is from a fresh water lens, or ground water. The fresh water lens forms from the infiltration of rainfall, which floats above the more dense salty sea water within the sand cay.

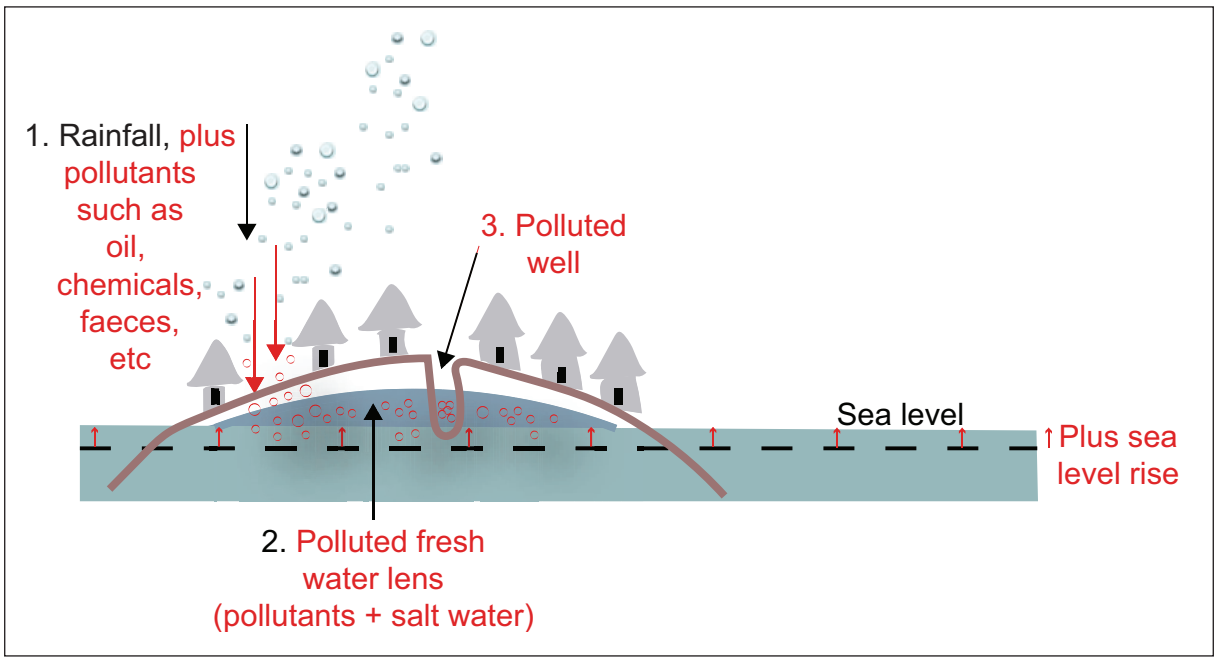
In South Tarawa, the supply of fresh water is in short supply due to pollutants, and is often brackish (salty or briny) due to a rise in sea level.

Wells are the traditional source of fresh water

### Traditional lifestyle – low population




### Today – high population density



# CHANGE IN SOUTH TARAWA

## Resource H: Population change in South Tarawa and Kiribati from 1995 to 2015

| Year | Population of South Tarawa | Population of the rest of Kiribati |
|---|---|---|
| 1995 | | |
| 2000 | | |
| 2005 | | |
| 2010 | | |
| 2015 | | |

## Resource I: Economic development and sustainability in South Tarawa

The deep-sea port at Betio, and the international airport at Bonriki at the eastern end, have meant that South Tarawa has become the centre of the country's economic development.

Industries in Betio include fish processing and exporting, import businesses, interisland boat terminals, and ship provisioning and servicing. Bonriki has a fledgling accommodation and service sector. The country's parliament, public service, foreign embassies, and other services (including the major hospital), are also located on South Tarawa, and have created employment, with 27% of the adult population working in cash employment.

Bonriki International Airport


Tuna exports

### Population problems

With economic development and better prospects for employment, plus a 'perceived' increase in living standards (including access to social services such as health and education), many people have moved from the outlying islands to South Tarawa; 70% of South Tarawa's population were born on other islands.

This migration has meant that since 1985, South Tarawa's population has nearly tripled to 60 000 in 2015, and its population density of 3 200 people per km², is the same as densely populated urban areas such as Tokyo and Hong Kong. South Tarawa's annual population growth rate is 4.1%, compared to only 0.2% for Kiribati's other atolls.

Dense settlement

Housing

**Other problems**

"While climate change and sea level changes present major long-term problems, the immediate problems are the same key issues as those facing many developing nations – providing enough food, water, and adequate sanitation", a representative from the Secretariat of the Pacific Community says. "Due to the high population density, we have contamination from housing, the pigs owned by many families, and sanitation practices", he adds.

In July 2013, during the day-long annual independence celebration, the Tungaru Central Hospital reported 1 118 cases of children reporting acute diarrhoea and vomiting over one fortnight period. It was reported that this was caused by the high-density housing, and consequent contamination of water supply, and inadequate sanitation.

Although South Tarawa has job opportunities, there is a job shortage, and 65% of adults seeking work are not employed. While the unemployed can engage in fishing, subsistence agriculture is not possible due to the shortage of available land.

As Kiribati is a fishing nation, it has never experienced a shortage of protein, as fish is generally freely available. However, there are few sources of carbohydrates found in foods such as breadfruit, rice, and flour. With an increase in wealth, and insufficient free land for agriculture purposes, South Tarawa has become heavily dependent on expensive imported foods. This increase in the use of imported foods and consumer goods has resulted in an increase in waste. "When the tide is up, it does look like a paradise. When the tide goes out, you see the horrible degradation because of humans", says a coastal engineer with the Kiribati Ministry of Works.


Imported foodstuffs

Rubbish on Green Beach, Betio Island

## Acknowledgements

Material from the following sources has been adapted for use in this examination (accessed 4 May 2016).

Geographic Concepts
http://seniorsecondary.tki.org.nz/Social-sciences/Geography/Key-concepts.

Introduction
http://userscontent2.emaze.com/images/acb4a095-2424-483a-b971-07d66297039c/d48a5a5a-bc4b-40f1-8f11-dd3c59518aa1.jpg, https://upload.wikimedia.org/wikipedia/commons/7/75/GilbertIslandsPos.png, and Google Earth (images).

Resource D
Google Earth.

Resource E
http://mosttraveledpeople.com/images/temp/27_20130615213258_69_33654_IMG_0125.JPG.

Resource F
http://image.slidesharecdn.com/aspecrisingsealevels-150312185500-conversion-gate01/95/rising-seas-solutions-12-638.jpg?cb=1426187504, http://www.climate.gov.ki/wp-content/uploads/2012/10/Human-face-of-climate-chang.jpg, and Google Earth (images).

Resource H
http://www.mfed.gov.ki/statistics/social-statistics/demography/demographic-indicators.