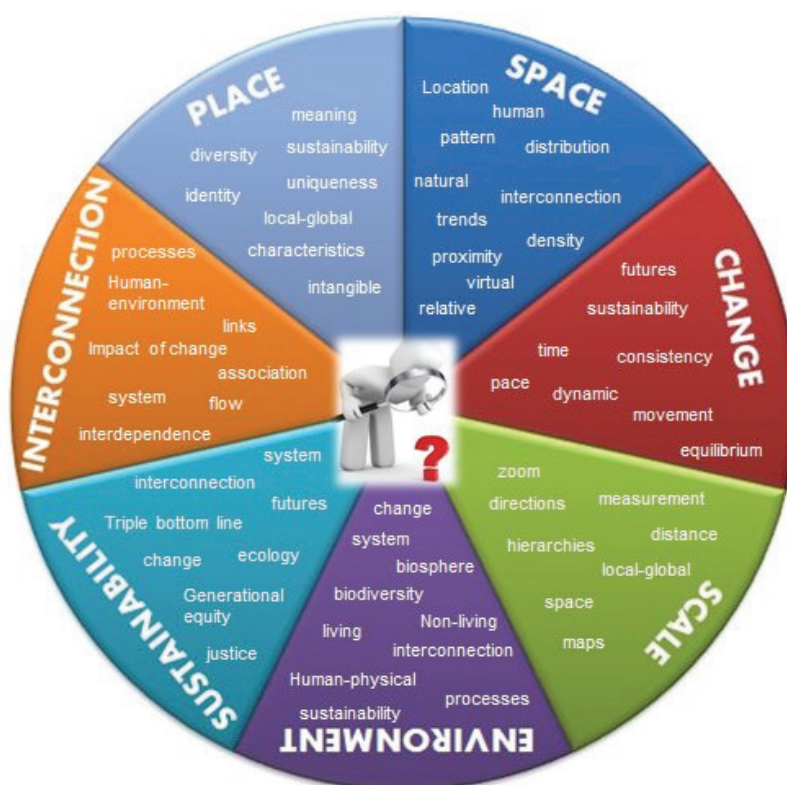


CHAPTER THREE

PLACE AND ENVIRONMENT



GEOGRAPHY, INDUSTRIES, POPULATION AND URBANIZATION



<http%3A%2F%2Fspatialworlds.blogspot.com%2F2013%2F11%2Fthinking-about-geographical-thinking.html&ei>

PHYSICAL GEOGRAPHY

RELIEF

Relief is the difference in slope and height of any area of land. The main types of relief features found in Fiji are Mountains, Rolling hill country, Plains, Plateaus, and Rivers.

Fiji lies 5,100 km southwest of Hawaii and 3,150 km northeast of Sydney, astride the main air route between North America and Australia. Fiji has a total land area of 18,274 square kilometers. Nadi is the hub of the Pacific air routes while Suva is a regional centre. The 180th Meridian cuts through Fiji but the International Dateline swings east so that the entire group can share the same day.

Fiji has up to 850 islands. 100 islands are permanently inhabited. They are all a variety in shapes and sizes. The main islands, Viti Levu, Vanua Levu, Kadavu, Koro, Rotuma, and Taveuni are volcanic high islands and the remainders are low islands (coral or limestone)

PLATE TECTONICS AND FIJI

Fiji is located at the Indo Australian and Pacific plate boundary between two opposite facing subduction zones. The stress created by the opposing plate movements has resulted in the formation of transform faults such as the Fiji Fracture Zone to the North and the Hunter Fracture Zone to the South.

Activity

- i. What is the International Dateline? Find out its position in Fiji?
- ii. What are Plate Tectonics? Find out more about the other theories of how the earth was formed?
The class can do more research on this with the help of the teacher.
- iii. On a map of Fiji locate and label the Fiji Fracture Zone and the Hunter Fracture Zone.
This will help you later on in your studies on 'Natural Hazards'.

TYPES OF ISLANDS AND THEIR CHARACTERISTICS

Topography: Types of islands in Fiji

Type	Examples	Characteristics
Volcanic high islands	Viti Levu, Vanua Levu, Taveuni, Lomaiviti group, Kadavu	High with rugged relief. Deep interior valleys. Jagged peaks and ranges. Lower coastal fringe.
Raised limestone islands	Kabara, Lakeba and Fulaga	Uplifted limestone deposits, fractured by volcanic action. Rise up to 300 metres but generally of low relief.
Coral islands/islets	Nukulau, Wailagilala	Very low relief. Soil generally sand.

ZNote: Some islands such as Vanua Balavu are a mixture, with a volcanic cone, flanked by limestone. The underlying rock is generally basalt or other volcanic rock.

REEFS

Fringing reefs are common along most of the coastlines and Fiji is outstanding for its many barrier reefs. The Great Sea Reef off the north coast of Vanua is the fourth longest in the world and the Astrolabe reef north of Kadavu is one of the most colorful.

Reefs surround all islands except the Southern half of Taveuni. The two types of reefs are:

a) Fringing Reefs: cover the off-shore plate forms and has little water on them. The area dries up at low tide..



com Source: www.taveuniislandsresort.com

b) Barrier Reefs: found at the edge of the underwater plate form and appear to be separated from the land



Source: www.originaldiving.com

MOUNTAINS

Mountains are towering steep-sided masses of rock that are over 1000 meters from base to peak. There are more mountains in Viti Levu as compared to the other islands in Fiji. Most of the mountains in Fiji are under the Conservation projects and are used as Eco-Tourism sites. For e.g. the highest mountain which is Mt Victoria (Tomaniivi) is under the 'Mareqeti Viti' project and the Landowners together with all the stakeholders have declared it a conservation site where logging is not allowed as well as unnecessary removal of any flora and fauna.

Mountains are: Mt Victoria (Tomaniivi) -1323m (highest)

- Mt Naserolevu-1032m
- MT Uluiqalau-1231m
- Mt Washington-839m

LOWLANDS

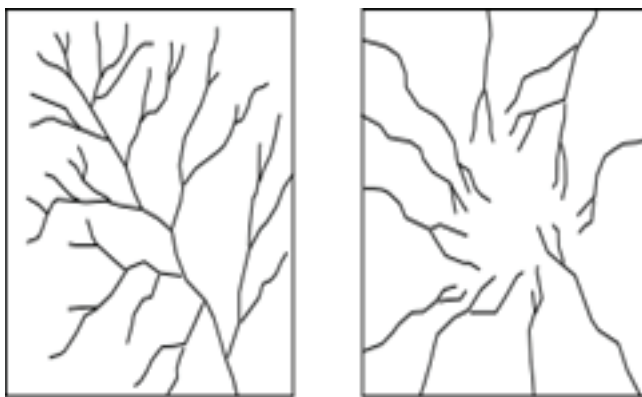
Lowland is limited in area i.e. along valleys and coastal areas

Viti Levu has broad floodplains and deltas near the mouth of the rivers and along the coast. Viti Levu's lowlands form only a small part of the total land area but they support the bulk of Fiji's agriculture. In Vanua Levu, the lowlands are also restricted and most are found on the northern side where they are broken up into small pockets by ranges of low hills running out to sea.

The sun burnt plains or the infertile grasslands of Vanua Levu is hot and dry during most part of the year and is called 'talasiga'. Taveuni is called the Garden Island because of the richness of the young volcanic soils and productive plantations (yaqona, dalo and coconut).

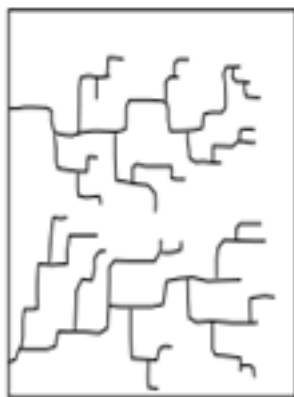
RIVERS (DRAINAGE)

The typical drainage pattern of Fiji is radial drainage, whereby the rivers seem to radiate out like the spokes of a wheel.



Dendritic Drainage

Radial Drainage

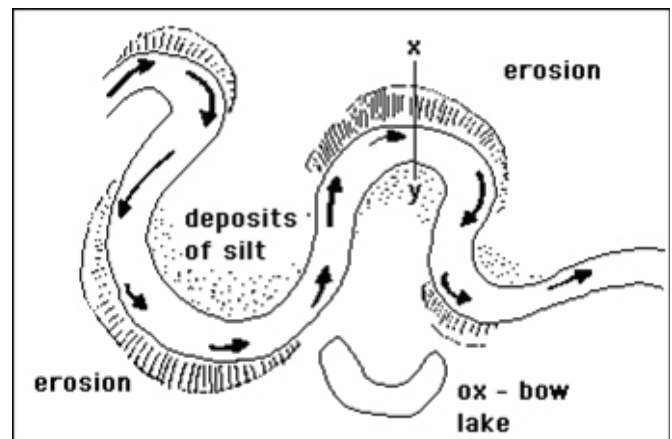


Rectangular Drainage

The rivers flow from the central plateaus in all directions to the coast. The large rivers are fan shaped (many tributaries or streams) collect or meet to form a main stream which then meander across its lowlands to the sea. The main rivers in Vanua Levu flow swiftly down to the coast because of the steepness of the land.

Meandering River Pattern

A meander, in general, is a bend in a sinuous watercourse or river. A meander forms when moving water in a stream erodes the outer banks and widens its valley, and the inner part of the river has less energy and deposits silt. A stream of any volume may assume a meandering course, alternately eroding sediments from the outside of a bend and depositing them on the inside. The result is a snaking pattern as the stream meanders back and forth across its down-valley axis. When a meander gets cut off from the main stream, an oxbow lake forms.



An example of a braided river pattern.

RIVERS IN FIJI

Deepest River-Dreketi (Vanua Levu) Widest and largest-Rewa (Nausori) Longest-Sigatoka (Nadroga)

PLATEAUS

Plateaus are areas of fairly flat land. The main plateaus in Fiji are:

- i. Muanivatu - 1,131 m
- ii. Colo-East - drained by the Rewa River
- iii. NavosaPateau - drained by the Ba River
- iv. Colo West - drained by the Sigatoka River
- v. Navua - drained by the Navua River
- vi. Nadrau - cradled between Mt Tomaniivi(1,323 m)

Activity

a) Draw a map of Fiji: locate and name the following clearly: b) Draw another map of Fiji mark and label the following:

- | | |
|--|--|
| 1. The 4 island groups | 1. The passage of water between Yadua and Vanua Levu |
| 2. The passage of water between Vanua Levu | 2. The highest mountain |
| 3. Koro Sea | 3. The widest river |
| 4. Somosomo Strait | 4. The longest river |
| 5. Kadavu Passage | |
| 6. Nanuku Passage | |

CLIMATE

Climate is the average weather condition of a place taken over a long period of time. Weather is the average weather condition taken over a short period of time usually within day. The elements of climate are wind, precipitation (rainfall) and solar radiation (temperature).

Fiji's climate is described as Tropical Oceanic type (in the tropics the islands are surrounded by the ocean). The windward sides of the larger islands are wetter and cloudier than the leeward sides. The smaller islands have a climate like the leeward sides of the large islands but the temperature range is smaller and rainfall is evenly distributed.

There are 3 types of climate in Fiji;

- i) Windward areas (Wet) e.g.-Suva
- ii) Leeward areas (Dry) e.g-Lautoka
- iii) Smaller islands-evenly distributed rainfall e.g. - Makogai.

The climate of the high islands is closely related to the South East Trade Winds. The windward slopes of the high islands catch the trade Winds head on and are usually wet, while those on the leeward side may be dry.

The official hurricane season south of the equator is November to April although they can occur in May and October.

FACTORS THAT INFLUENCE CLIMATE

1. Distance from the equator: (Latitude)

- a) Fiji's location in the tropics gives it 'high sun' throughout the year
- b) Temperature is usually very high at 77
- c) April to November (Winter Season) – the sun is overhead. (hot, dry days and cool nights)
- d) Summer season is from November to April (cyclone season). Winds are more variable and the Northerlies in particular bring in heavy rain to the northern sides of the main islands.
- e) Convectional rainfall occurs a lot during the summer months because of the greater amount of heat.

2. Distance from the Sea:

- Areas closer to the sea are warmer than those far away.
- These areas will receive more rainfall especially if it is on the windward side of the larger island

3. Insular Nature: (Size of the island)

- The larger islands have a distinct wet and dry climate
- The smaller islands have a more equable climate; evenly distributed rainfall and moderate temperature.

4. Relief

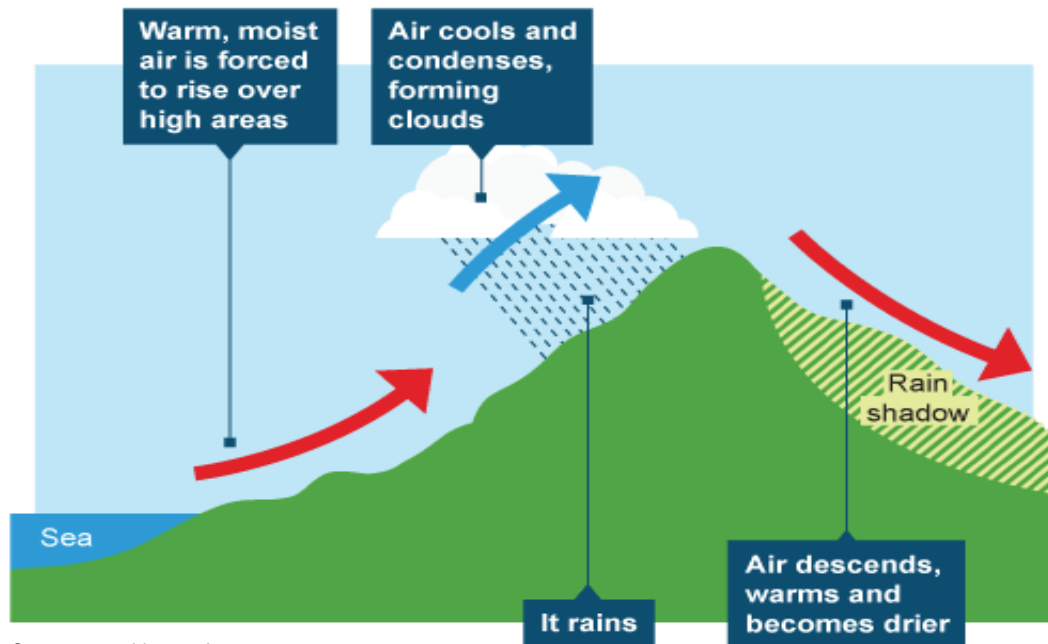
- The mountains of Fiji are not high enough to have snow and frost but are high enough to influence climate
- Their effects bring a distinct wet and dry side

Types of Rainfall

There are 3 types of rainfall:

- i. Orographic or relief rainfall
- ii. Convectional Rainfall
- iii. Frontal or Cyclonic rainfall

i. Relief or Orographic rainfall:

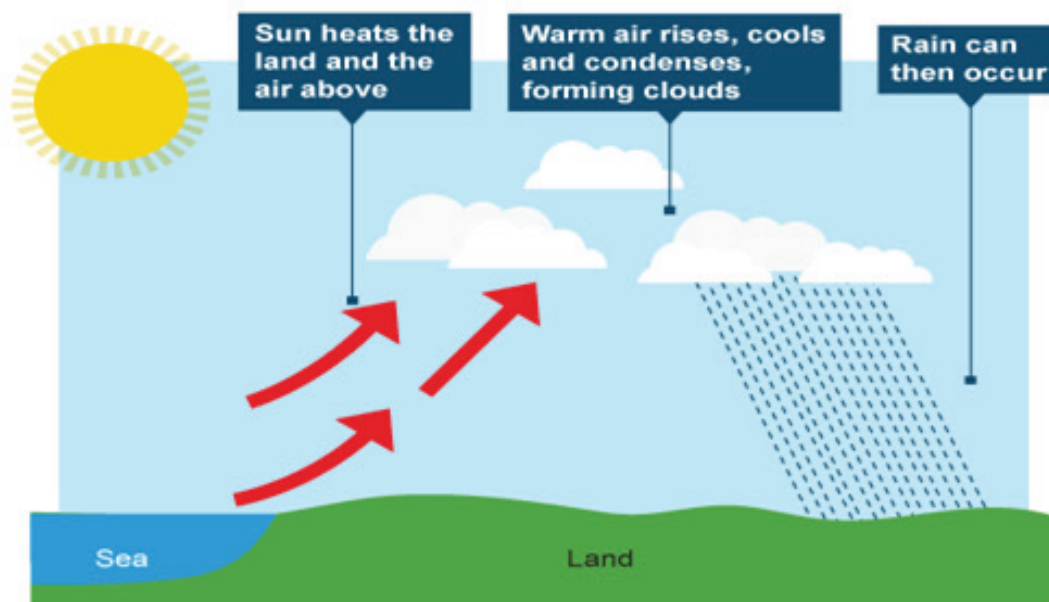


Source: www.bbc.co.uk

- a. As the South East Trade Winds blow across the ocean, they are warmed.
- b. As they move across, they pick up and carry an increasing amount of water vapor.
- c. When they reach land, they are forced upwards over the mountains.
- d. As they are cooled the moisture forms clouds.
- e. The clouds become heavy and much of the moisture is drier because much of the moisture has been lost.
Instead of dropping, the winds pick up moisture.

ii. Convectional Rainfall

- a. The earth's hot surface heats the air above it. The heated air becomes lighter, as it expands and begins to rise.
- b. The rising air expands and cools. Condensation takes place and clouds form
- c. Further ascent causes more cooling with expansion. Rain begins to fall.



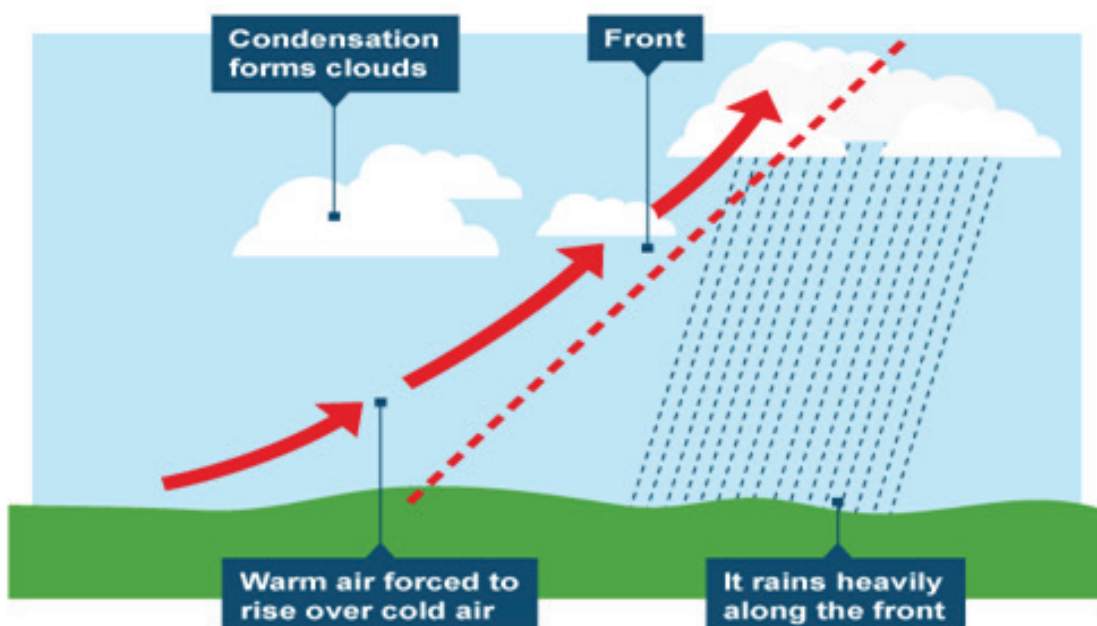
Source: www.bbc.co.uk

iii. Cyclonic/Frontal Rainfall

- a. Occurs when warm moist air comes into contact with cool air during a passage of depression. This is most common during tropical cyclones and hurricanes.

Solar radiation is sunshine, which brings light, heat and many other electromagnetic rays that are essential to life on earth. The amount of radiation received in Fiji depends on:

- i. The time of the day
- ii. The time of the year
- iii. The atmospheric condition-cloud or pollution cover.



Source: www.bbc.co.uk

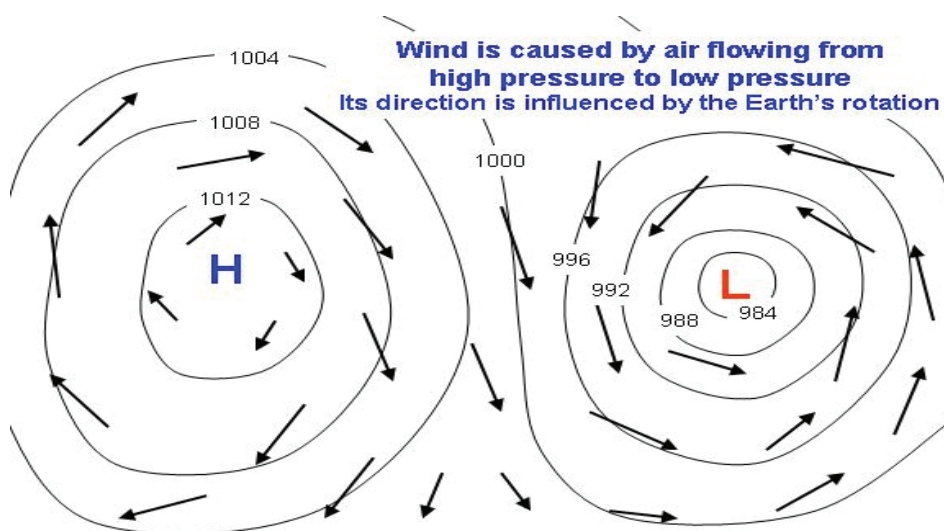
WIND

Wind is moving air. It is expressed in kilometers per hour and measured with an anemometer. Wind direction is expressed as the compass point from where the wind is blowing. The main Wind Systems reaching Fiji and influencing the climate of Fiji is the South East Trade Winds and the North West Trade Winds.

WEATHER MAPS.

Anticyclones-Large areas of high pressure shown on weather maps as H. Anticyclones usually bring fine, settled weather. The isobars are far apart.

Depressions-areas of low pressure shown weather maps as L. Depressions usually bring wet, windy weather. The deeper the depression, the more wind and rain it brings. The isobars are closer to each other.



1. What do H and L represent?
2. What do the numbers in the above weather map represent?

SOIL

Soil is the natural material for plant growth. Soil makes up the top layer of the earth's crust. Rocks on the earth's surface are broken down overtime into many small fragments by the erosive forces of rain, wind and the sun combined with the rotten remains of plants and animals

Geologically the islands of Fiji are formed from igneous, metamorphic and sedimentary rocks. They have evolved through a series of major tectonic events followed by varying episodes of erosion, deposition and uplift. With significant variation in rocks Fiji has a variety of soil type derived from different parent materials which after years and years of weathering will eventually change into soil.



Different types of soil and its different textures

Soil Parent Materials	Explanation
Regolith	Commonly found in the hill country and it is directly derived from the underlying parent rock or in material moved relatively small distances down slope under the influence of gravity
Colluviums	Refers to deposits that accumulate on and at the base of slopes as a result movement by gravity. Colluvium often shows evidence of successive periods of deposition (layering including buried soils.)
Alluvium	Refers to sediments deposited by streams and rivers. Alluvial deposits often consist of layers of different textured materials, for e.g., sand and silt layers overlying coarse gravel. Such are common along our major river system-Nadi, Sigatoka, Navua, Ba, Rewa, and Dreketi.
Marine deposits	Refers to deposits that occur in both the tidal and non-tidal zones and comprise of sands and sediments trapped in the mangrove ecosystem.
Aeolian	Consists of deposits arranged or transported by wind. Narrow deposits of wind-blown sand occur at many locations on most islands. They are mainly from coralline sands and therefore are found adjacent to the coast e.g., in the Yasawas. There are also very small areas of black metallic sands e.g. the Dawasamu soils
Tephra	Is air fall material that is ejected from volcanoes, into the atmosphere and then redeposit across the landscape. Layers of tephra are common only on the young volcanic islands of Rotuma, Taveuni and part of Koro.

FACTORS AFFECTING SOIL FORMATION

i. Climate

The direct influence of rainfall and temperature influence the type of soil the area will have. Rainfall is also responsible for the washing out (leaching) of main mineral elements and the movement of clay from soil horizons.

ii. Relief

The shape of the land (its topography) and in particular its slope or steepness can have a major influence. They affect the amount of water available for weathering, leaching out of nutrients and other chemical and biological changes.

iii. Biological Factors

Biological factors include human activities are perhaps the most complex of the soil forming factors. Plants, climatic elements, organisms all contribute to the type of soil present there.

Plants provide shade as well as plant litter which will greatly contribute to fertile soil.

Animals that live in them (earthworms and beetles) as well as those that live on them such as chickens speed up the breakdown of dead plants and mix it with them as well as their droppings.

iv. Time

The soil type is influenced by the amount of time over which the soil forming processes have been acting. Weathering and soil development do not happen suddenly, but gradually over great periods of time.

CLASSIFICATION OF SOIL IN FIJI

Fiji's soil can be grouped genetically as follows:

- Young sandy soils formed around the coasts of the island-coastal strand vegetation e.g. beach morning glory, (Vunivadra).
- Fertile, deep, agriculturally important alluvial soil occupied the valley bottoms most areas of cash farming.
- Shallow and moderately deep, dark colored nutrient rich soil on rolling and hilly land supporting native vegetation and grassland.
- In the drier parts of Fiji the plants found are mostly thin barked with thin green leaves e.g. pine trees and nokonoko.
- In the wet parts of Fiji evergreen trees, fleshy leaves are the most native trees present in the highlands.e.g.Namosi, Serua, Naitasiri and Tailevu.

With some exceptions, Fiji's soils are of low fertility. The high rainfall washes, or leaches the soluble minerals required by plants from the top layers of the soil. In Fiji lateritic soil is common and farmers practice shifting cultivation in order to regain its fertility.

VEGETATION



[Source: <http://www.bing.com/images/search?q=vegetation++pictures&view+detail>]

The vegetation of an island in the Yasawas as Fiji is well known for its tropical climate and luscious vegetation. Fiji shows some of the uniqueness and diversity of the terrestrial biota found in the Pacific.

Flora (vegetation) is richer too on the main islands but some of the smaller islands also have a number of plants belonging to one family such as the 'hibiscus tiliaceus' (vau) and 'hibiscus rosa-sinensis' (senitoa) or hibiscus flower.

Major Types of Vegetation in Fiji

Fiji has 11 major types of vegetation

- i. **Tropical Lowland and rainforest**
Mainly evergreen broadleaf species. Very little undergrowth
- ii. **Montane or Sub Montane Rainforest**
Dominated by broadleaved trees. Contains some needle-leaved or small-leaved species e.g. dakua, nokonoko
- iii. **Riverine/Riparian Forest**
Grow along freshwater streams and rivers. Trees are tall and buttressed e.g. Tahitian chestnut (ivi), palms, forbs and broadleaf evergreens are common
- iv. **Swamp, Bog Forests**
Grow in freshwater or brackish swamps. Mostly buttressed trees (ivi). also contains palms, sago, pandanus, and vutu species.
- v. **Seasonal Forests**
Contains deciduous forest and other that are adapted to withstand droughts and fires (develop very thick bark) e.g. molau, sacau, nokonoko and cau

vi. Mangrove Forests

In tidal rivers, estuaries, bays, muddy/silty ocean shores. e.g. mangroves, sagale, pandanus. They are very important in terms of its usage for dyes, firewood, medicine, habitats for animals, crabs and trap silt to build new land, and fisheries as nurseries for fish.

vii. Atoll/Beach Strand Forest

These are communities of Pan Pacific/Pan Tropical species.
For e.g. coconuts, dilo, vutu, tavola, vadra/balawa.

viii. Woodlands

Grasslands where trees cover at least 30% of the area. They have a broken canopy.
There is a dense/thick undergrowth of grass and shrubs.

ix. Savanna/Grasslands

Found in the drier areas with little and seasonal rainfall e.g. Western Viti Levu and Northern Vanua Levu.
Apandanus savanna is found near Deuba.

x. Aquatic Freshwater Vegetation

Reed swamps, floating plants (water hyacinths) otakarisi and aquatic weeds

xi. Marine Vegetation

Sea weeds (lumi), algae, sea grasses etc.

Endemic plants

The best forested islands are the limestone islands such as Kabara, Vatulele and Ogea where the rugged terrain has protected fine strands of special forest type. Endemism is the process by which a plant is found only in one area and nowhere else in the world.

Fiji's endemic plants include the Tagimoucia (Medinilla water-housei) of Taveuni and Seaturamouintains, mama/lutulutu/ovutu (Macaranga membranacea) of Vanua Levu and Selala (Rhizophora selala) of the Samabula mangrove forest.

Activity

Teacher organizes class to research on each vegetation type (one vegetation type per group). Students find out the influence of the physical environment on the vegetation type (climate, relief, soil), its adaptive features, problems encountered, solutions, uses /benefits (if any) and a map where the vegetation can be found



Tagimoucia plant

LAND USE AND CROPS

The use of land in Fiji is influenced by a combination of factors such as physical and cultural factors. Physical factors include relief, climate and soil while social and cultural factors include people's use of the land (Individual farmers), land ownership and land tenure, transport availability and access to markets, marketing methods, and capital available for development and improvement, market demands and prices.

Physical factors

1. Relief and slope
 - Whether the land is high, hilly and rocky or low, flat lands and big plains it will influence the type of crop grown there and how successful a farmer is in utilizing this land.
 - Whether it is close or far from the water sources or rivers
2. Climate
 - The amount of rainfall and solar radiation it receives
 - Regularity(how often rain-falls)
 - Seasonal distribution of rainfall (winter and summer)
3. Soil Characteristics
 - Red dry and leached soil or dark, humid, rich and alluvial soil.
4. Temperature-warm and cool
5. Other factors
 - Sunshine hours.
 - Hurricanes
 - Floods
 - Other climatic extremes



A sugar cane farm along the highway in DrasaLautoka
www.21food.com/product/search-keys-sugar+cane+fruit-pl.html

Cultural and Social Factors

1. Individual farmers
 - This depends on the farmer's needs, skill and experience
2. Land ownership and type of tenure
 - Lease or Freehold
3. Transport Availability and Access to Markets-
 - how good are the services by roads, railway, boats and air transport and how near or far the markets are
4. Marketing Methods
 - cooperatives
 - contracts
 - sale to middlemen
5. Capital Available for Development and Improvement
 - source of credit and rates if interest(e.g. bank loans)-
6. Market Demands and Prices
 - how much is needed and can be sold to make profits

(Both sets of factors are interrelated and other factors could be included e.g. Overseas demand and prices)

THREE TYPES OF FARMING

1. Village Farming/Non Village Farming
2. Commercial Farming (crops)
3. pastoral Farming

1. Village Farming (Traditional Land use)
 - The oldest and most widespread type of farming.
 - Is an essential part of the traditional i-Taulei way of life.

Area

- Nearly half the country's total agricultural land is used for village farming
- Villagers grow crops on land which they do not own(mataqali land)
- Land used is near the villages

Methods of Farming

- Labour or work is shared amongst the villagers
- Permission should be obtained first from the members of the clan (mataqali)
- A person's plot will be scattered, this is to give everyone a share of the fertile land
- The village headman (turaganikoro) let the villagers perform duties (e.g. clearing and planting)
- Farming is mainly subsistence
- Shifting cultivation is widely practiced in most villages (they move from place to place to leave the soil fallow for a while so as to regain its fertility)
- In the interior villages, the soils are not fertile except in the valleys. They practice semi subsistence farming (sell some of the crops in towns to buy clothes, kerosene and other food materials. This is widely practiced nowadays around Fiji as people struggle to buy things to their families' satisfaction.

Crops Grown

- Cassava-drier infertile soils on hilly areas
- Yams-dry more fertile soils
- Dalo-wetter soil near rivers or the humid soils of the valleys
- Bananas-grows better in cool humid areas(near rivers or humid lowlands)
- Coconuts-coastal areas and reaching up to the hills
- Yaqona-inland where the soil is cool and humid(grown especially for commercial and traditional use)
- Market garden crops for villages mainly close to towns.

Size of the Farm

- Sizes of farms differ from place to place depending on type of farm (subsistence or semi subsistence), type of soil, climate, landform, the influence of different types of people.

NON VILLAGE SETTLEMENTS-(GALALA)

- Villagers who choose not to work under the village system as they establish themselves as individual farmers(galala farmers).Some plant for the subsistence use but others do commercial farming on those piece of land and the outcome is great as most of them do not belong to those villages nearby and therefore are independent and fend for themselves. For example in Lomaivuna, Wailasein Naitasiri.



Source: www.spc.int

COMMERCIAL FARMING

The major commercial crops grown in Fiji are Sugarcane, Copra, Ginger, and Rice, although some are not exported but they are consumed locally and are sold in the local market

SUGARCANE FARMING

Planting

- Early in the year, during the wet months with the help of the neighbors and a few hired laborers, the land is ploughed and harrowed.
- The cuttings of seed cane are planted in rows 1.5 meters apart.(the main varieties are mana,mali,vatu and ragnar)
- Young cane is fertilized with superphosphate and ammonium with addition of potassium on hilly lands
- Routine weeding, fertilizing and care of crop is done by the farmer and his family.
- After 14-16 months depending on the weather, the first cane is ready for harvest.



Source: www.fijitimes.com

Harvesting

- Harvesting period is spread over 7 months (May to December), the period when the sugar content in the cane is at its highest.
- Usually done by cane gangs (Each gang selects a leader or sardar)
- After this crop is harvested, another grows from the same stem, known as ratoon crop.
- After the last ratoon crop (5 years) is harvested, the land is ploughed and legume or green manure crop e.g. cowpea is grown (adds nitrogen to soil).
- Part of the farm is used to plant vegetables and other food crops.



Source: rochedalss.eq.edu.au

Harvesting cane in a cane belt in Fiji. (Nowadays harvesters are used as compared to the old, traditional way of cutting cane by a gang with the leader as a sardar).



Harvesting by hand

Transport

- The crushing mills are located at Lautoka, Ba (Rarawai), Rakiraki (Penang) and Labasa.
- The cane is cut and transported to the mills by trucks and rails.



Source: fijione.tv

Markets

- Fiji sells 175000 tonnes to European markets
- Other markets include the USA, Malaysia, China, Japan (World market), Canada, and Korea.
- 28000 tonnes are sold locally every year.
- 10 500 tonnes are sold to Pacific Island countries like New Zealand, Samoa, Tonga, Kiribati, Solomon Islands etc

Problems

- Fluctuation of sugar prizes
- Strikes; mills stop and farmers can lose the harvested crops
- Country will not meet its quota for export therefore will be surcharged to get sugar from elsewhere
- Country can lose its markets due to competition from outside and the global recession (2010)
- Cane burning-difficult to process as most of the sugars exported are white sugar.
- Weather-prone to flooding (January 2012 flooding was one of the worst flooding in the history of Sugarcane production in Fiji-both for most farmers and the mills especially Rarawai) low yields can be the result of droughts, hurricanes, flooding.

- Diseases: in Fiji 'Downey milaew' can cause cane losses
- Land Tenure: there is much uncertainty over the renewal of long term leases.

Activity

1. Where is sugarcane farming concentrated on the two large islands and why?
2. Why is Fiji different from other sugar-producing countries?
3. Compare and contrast the two methods of harvesting that is, harvesting by hand and by combine harvester.
4. Name some by-products of sugar.
5. Discuss 5 problems faced by sugarcane farmers in Fiji and what has been done to rectify the problems

RICE FARMING

Location

- Both dry and wet rice are grown
- Dry rice is grown on many cane farms
- Irrigated rice is planted out after being raised in a nursery, plenty of rainfall is required so it is mainly found on the wetter sides-irrigated areas of Navua, Nausori and Dreketi and Bua river flats

Method of Farming

- Land is ploughed and harrowed several times in November or December after the first heavy rain until the weeds have died and the soil is muddy.
- Rice seeds are planted in nursery beds and after the shoots are about 30 cm they are transplanted onto the muddy fields.
- Dry rice cultivation involves the direct sowing of seeds either by hand or by drills made by a tractor.
- Dry rice matures quickly but requires a lot of weeding
- On most farms harvesting is done by family members. Sickles are used to cut the crops.
- The grains have to be thrashed to shake out the rice grains and then taken to a mill to be polished.



Source: www.fijitimes

RICE PLANTING

Problems

Causes of low yields-

- Uncertain rainfall or excessive rainfall which may cause flooding
- Inadequate water control
- Poor drainage
- Weather-flooding or drought
- Pests and diseases

Markets

- Fiji does not grow enough to be self-sufficient; whatever is grown is sold locally.

Yaqona Farming

- 'Yaqona' or Kava is the traditional drink for Fiji. Although nowadays most people consume it as a form of pastime, it is still a very important part of the iTaukei Way of life.
- Yaqona' has also grown from its early stages of just a drink to being commercially grown as it is a source of income for most rural dwellers.
- Exportation of the product for medical research and cures to being processed into drinks and farmers are benefitting from this. Most of our
- Yaqona is exported to other Pacific Island countries and we import some too from the other Pacific countries.
- A one kilogram of 'waka' can cost you \$40.00.
- Yaqona grows well on well watered and well-drained soil

Other crops grown

Crops grown	Areas (locations)	Problems
Ginger 	Waibau, Naitasiri Navatuvula, Sawani	• Erosion • Drainage should be good • Nematode infestation
Cassava 	All over Fiji	• Market is a problem for farmers • Adverse weather conditions and climatic extremes • Prices in the local market are very low as compared to its care from the beginning to the time of harvest.
Yams 	Can be grown anywhere in Fiji	• Climate • Diseases • No overseas market and local market depending on who will buy the product.
Dalo 	Taveuni, Naitasiri, Tailevu, Navua	• Low prices • Transportation • Market • Diseases/Dalo beetle • Laborers
Bananas 	Naitasiri and along major river systems (floodplains) in Fiji	• Flooding/hurricane • Market • Pests and diseases

Potato 	Nadarivatu, Ra	Quality is not the same as the imported ones
Pawpaw 	Salad Bowl of Fiji	Climatic extremes
Tobacco 	Nadi, Sigatoka Valley (Virginia Tobacco)	- Flooding especially since the farms are located in low-lying areas or in floodplains - Market - Accessibility of roads
Pineapple 	Salad Bowl of Fiji, Seaqaqa,	- Diseases - Markets - Accessibility to markets
Flowers 	Mostly grown in areas where the weather suits that particular flower.	- No fixed market except for hotels and boutiques - Climatic extremes

Activities

- In a paragraph describe rice farming under the following: location, methods of farming, problems and markets. Check the location of farms.
- How is the government trying to improve the production of rice in Fiji?

PASTORAL FARMING

Location

- Scattered distribution on :
 - a) extensive grassland areas (large farms) on the dry sides of the main islands
 - b) most cane farms where they are used as work animals

Methods of farming

- Indo Fijian farmers graze cattle and goats on the leased holdings in the hill areas inland from the coastal cane farms
- Cattle run primarily for beef are found on 3 types of land:
 - a) An extensive farm runs on ranch type basis in Yaqara. Here the Fiji Pastoral company runs Hereford and Brahman cattle on 7,300 hectares of improved grassland.
 - b) Small beef fattening farms less than 500 acres had been developed in Yalavou in Sigatoka and Uluisaivou in Rakiraki.
 - c) Cattle are grazed on copra estates in order to control weed growth and to provide meat for the farm staff.

Problems

- Grazing consists of poor unimproved grasses mainly wire grass and blue grass type
- Land is rarely fenced
- Burning and growth of weed pests (guava) result in low density
- Overstocking results in overgrazing
- Shortage of feeds in the drier months
- Diseases which kill a lot of cattle's and therefore a loss to farmers (brucellosis disease)

Markets

Fiji is still not self-sufficient in meat production and has to import its needs.

Whatever is produced is sold locally

Activity

What can be done to improve the quality of the herd?

Sheep farming

- Sheep farming has been trialed out at Ravua Pastoral Farm in Ra. This is an independent privately funded firm that allows the implementation of rapid changes to strategy. If this is a success then we won't have to rely on imports for our supply of lamb products.
- The farm has grown from just 50 sheep to 300 sheep as of December 2010.
- Ravua Pastoral Farm intends to begin contract farming with farmers in the area, that is, farmers look after 50 sheep and share the profits with the company.
- Sheep is grazed in the forest.
- Problems faced by sheep farmers include lack of capital to start their own farms and lack of modern management skills of animal husbandry and pasture management.



Sheep drenching done in a race at Ravua Pastoral Company in RaSource: www.fijitimes.com

Other Livestock/Poultry Farming

Goat Farming 	Grazed on all kinds of country but mostly on hilly places and where Indo Fijian settlements are located	No fixed overseas market for Fiji to import the livestock to.
Dairying 	South Eastern VitiLevu	Brucelousis disease which affects cows. Market demand Imported raw materials were too expensive.
Pig Farming 	Vuda Piggery, and other places around especially near Fijian villages	Feed is too expensive Diseases. No overseas market.
Chicken/Duck Farming 	Crest Poultry, Ram Sami Poultry,	Diseases At times demands are not met due to shortage especially during peak season such as Christmas

VOCABULARY

1. **Bovine**-oxen cattle
2. **Capital**-money or other assets used to finance a commercial enterprise
3. **Cash crop**-crop grown for sale outside the farm or village. Cash cropping is called commercial farming
4. **Domestic**-related to the home: also of country rather than overseas e.g. a domestic or internal market for goods.
5. **Drought**-a prolonged period without rainfall. This might be only a few months in Fiji.
6. **Gross Domestic Product** (GDP)-the total value of wealth, goods and services produced within a country.

INDUSTRIES

What is meant by industry? In its widest and traditional sense, the word industry is used to cover all forms of economic activity: primary (farming, fishing, mining and forestry); secondary (manufacturing and construction); tertiary (back-up services such as administration, retailing and transport)

Factors Affecting the Location of Manufacturing Industry

1. Raw Materials – industries are located close to raw materials, sources of power or ports, mainly because the raw materials were heavy and costly to move. Today industries are rarely tied to the location of the raw materials and so are described as footloose. Industries which need to be located close to raw materials are those using materials which are heavy, bulky or perishable.
2. Power supplies – early industry tended to be located near to sources of power because they could not be moved. As new forms of power were introduced and the means of transporting it were made easier and cheaper, this locational factor became less important. Today, oil, coal, natural gas, electricity, nuclear and hydro-electric power can all be used.
3. Transport – transport networks have improved with the building of roads, and methods of handling goods have become more efficient through containerization. Today raw materials can be transported further and finished goods sold in more distant markets.
4. Markets – industries will locate near to markets if:
 - The product becomes more bulky with manufacture
 - The product becomes perishable after processing
 - The market is very large
 - The market is wealthy
 - Prestige is important (publishing).
5. Labour supply
6. Capital
7. Government Policies
8. Land
9. Environment

EXPORTS and IMPORTS

Exports refer to selling of goods and services to overseas countries and earning foreign reserves.

Fiji exports sugar, timber, fruits and vegetables, garments, gold, kava, bauxite, copra and coconut oil.

Imports are the buying of goods and services and making payments for them.

Fiji imports food, beverages, crude minerals, chemicals, manufactured goods, machinery and heavy equipment.

Fiji's major trading partners include Australia, new Zealand, China, France, Japan, Pacific Islands, India Malaysia, Singapore and USA to name a few.

Activity

1. Differentiate between domestic trade and international trade.
2. Discuss three reasons for international trade.
3. State two ways a country benefits from international trade.

Importance of Industries

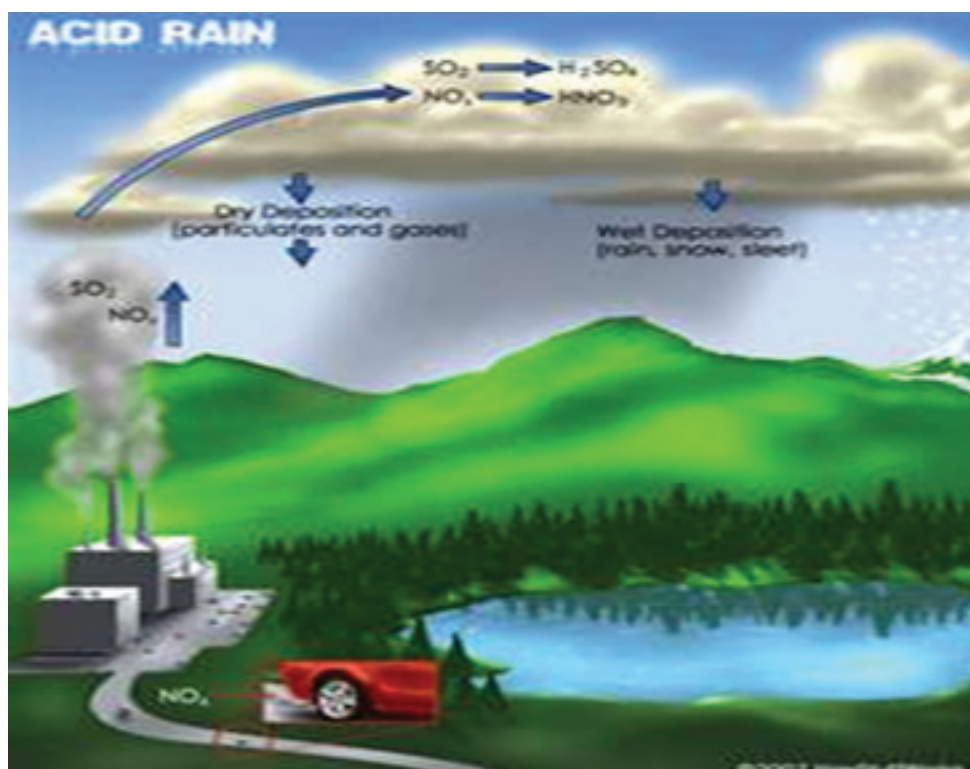
- Creates employment
- Earn foreign exchange
- Contribute towards Gross Domestic Product
- Leads to development of infrastructure in semi-urban areas
- Multiplier effect – development of other sectors such as transportation, banking, insurance
- Improves peoples' standard of living

INDUSTRIES AND THE ENVIRONMENT

- Pollution is the contamination of the earth's environment with materials that interfere with human health, the quality of life, or the natural functioning of ecosystems (living organisms and their physical surroundings).
- Although some environmental pollution is a result of natural causes like volcanic eruptions, most is caused by human activities.
- Human contamination of the earth's atmosphere can take many forms and has existed since humans first began to use fire for agriculture, heating and cooking.
- During the Industrial Revolution of the 18th and 19th centuries however, pollution became a big problem.
- Pollution has a dramatic effect on natural resources. Ecosystems such as forests, wetlands, coral reefs and rivers perform many important services for the earth's environment. They enhance water and air quality, provide habitat for plants and animals and provide medicines and food.
- Any or all of these ecosystem functions maybe affected or destroyed by pollution.

AIR POLLUTION

- Industries contribute to environmental pollution. Smoke from factories build up in the atmosphere, sulphur and nitrogen oxides are converted into acids that mix with rain. This acid rain falls in lakes and on forests where it can lead to the death of fish and plants and damage the entire ecosystems.
- One of the greatest challenges caused by air pollution is global warming, an increase in the earth's temperature due to the buildup of atmospheric gases such as carbon dioxide.



- This trend appears to be a small change, the increase would make the earth warmer than it has been in the last 125,000 years possibly changing climate patterns, affecting crop production, disrupting wildlife distributions and raising sea level.
- Smoke from factories can affect the ozone layer, the protective layer in the atmosphere that shields the earth from the sun's harmful ultraviolet rays.

WATER POLLUTION

- The demand for freshwater rises continuously as the world's population grows.
- Sewage, industrial wastes agricultural wastes and chemicals are the main causes of water pollution.
- Primary effects of pollution occur immediately after contamination such as the death of marine lives, plants and wildlife after an oil spill at sea or industrial wastes pumped into the water source.
- Secondary effects may be delayed or may persist in the environment in the future, perhaps going unnoticed for many years .DDT a non-degradable compound seldom poisons birds immediately, but gradually accumulates in their bodies. Birds with high concentrations of this pesticide lay thin –shelled eggs that fail to hatch or produced deformed offspring.

SOIL POLLUTION

- Unhealthy soil management methods have seriously degraded soil quality, caused soil erosion and soil pollution.
- Treating the soil with chemical fertilizers, pesticides and fungicides interferes with the natural processes occur within the soil and destroys useful organisms such as bacteria, fungi and other microorganisms.
- Solid wastes are unwanted solid materials such as garbage, plastics paper and synthetic materials, metals and wood. Billions of tons of solid wastes are thrown out annually.
- Areas where wastes are buried are called landfills are the cheapest and most common disposal method for solid wastes worldwide. Landfills quickly become overfilled and may contaminate air, soil, and water.

NOISE POLLUTION

- Unwanted sound or noise such as that produced by airplanes, traffic, or industrial machinery is considered a form of pollution. Noise pollution is at its worst in densely populated areas.
- It can cause hearing loss, stress, high blood pressure, sleep loss, distraction, and lost productivity.

OCCUPATIONAL HEALTH AND SAFETY

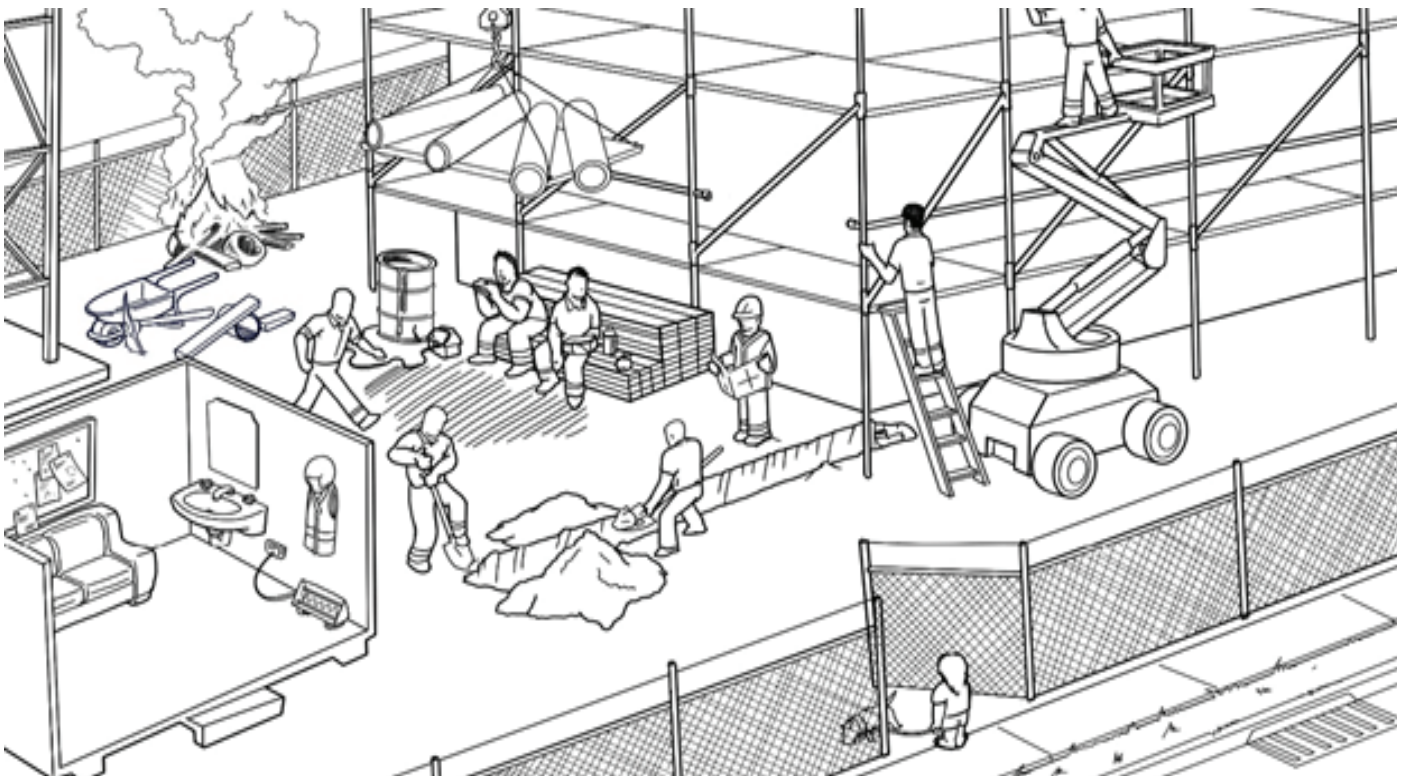
Industrial Safety is an area of safety engineering and public health that deals with the protection of workers health, through control of the work environment to reduce or eliminate hazards. Industrial accidents and unsafe working conditions can result in temporary or permanent injury, illness or even death. They also take a toll in reduced efficiency and loss of productivity. In Fiji the OHS department is under the Ministry Of Labour and they attend to individual complaints or otherwise do random checks to see that each individual workplace is OHS compliant.

HAZARDS IN THE WORKPLACE.

- Various external sources such as chemical, biological or physical hazards can cause work related injury.
- Hazards may also result from the interaction between worker and environment: these so called ERGONOMIC hazards can cause physiological and psychological stress.
- Chemical Hazards can arise from the presence of poisonous or irritating gas, mist or dust in the workplace.
- Biological hazards arise from bacteria or viruses transmitted by animals or unclean equipment and tend to occur primarily in the food processing industry.
- The source of the contamination must be eliminated or when that is not possible, protective equipment must be worn.
- Common physical hazards include ambient heat, burns, noise, vibration, sudden pressure changes, radiation and electric shock.
- If the physical, psychological or environmental demands on workers exceed their capabilities, ergonomic hazards arise. This type of hazard frequently occurs in the area of material handling where workers must lift or carry heavy loads.
- Poor working postures or improper design of the workplace often results in muscle strains, sprains, fractures, bruises, and back pain. These injuries account for 25% of all occupational injuries as their control requires designing the job so that workers can perform it without injuring or overworking themselves

REDUCING INJURY IN THE WORKPLACE

- In recent years engineers have attempted to develop a system approach (termed safety engineering) to industrial accident prevention.
- Because accidents arise from the interaction of workers and their work environments both must be carefully examined to reduce the risk of injury.
- Injury can result from poor working conditions so the use of proper designed equipment and tools would stop fatigue, distraction, body pains etc.
- All work locations should be checked to stop or control hazards.
- Operating methods and practices should be followed well to make sure that workers are protected.
- Employees and supervisors should be trained to help them realize the importance of safety in workplaces.
- The systems approach more over demands a thorough examination of all accidents and near misses. Key facts about accidents and injuries are recorded along with the history of the worker involved and to see that the type of accident does not happen again.
- The systems approach also pays special attention to the capabilities that recognizes individuals and how they work and their abilities. The job should be suitable for the workers.
- Hazards elimination may require the use of alternative and less toxic materials, improved ventilation, leakage control or protective clothing.
- If possible workers are required to wear protective equipment depending on the hazard risk; this equipment may include safety glasses, earplugs, ear muffs, face masks, heat radiation protective suits, boots gloves, and helmets. To be effective however the protective equipment must be appropriate, properly maintained and worn by the worker.



Identify the hazards in the diagram and discuss ways to solve or 'remove' the hazard

Activity

1. Explain production in your own words.
2. Use the mining industry to explain and demonstrate the stages of production, that is, primary, secondary and tertiary.
3. Which of the following is the product of apiculture?

A. Prawn	C. Gold
B. Pine chips	D. Honey
4. Classify the following people according to whether they work in primary, secondary or tertiary industries.

A. Lawyer	E. Insurance Agent
B. Forest Ranger	F. Carpenter
C. Car Manufacturer	G. Bauxite Miner
D. Bank Teller	H. Bee Farmer
5. Use the photograph below and your knowledge to answer the questions that follow.



Source: Tourism Fiji

- a. State one example of a primary and a secondary industry that is associated with the tourism industry.
- b. Explain two economic benefits of the tourism industry.
- c. Discuss two problems faced by the tourism and two problems caused by the industry.
- d. Discuss solutions to the problems in (c).
- e. If you were a tourist operator, what can you do to ensure that the services that you provide will promote 'sustainable tourism'?

POPULATION AND URBANISATION

Demography is the study of human population. It is important to remember that the situation is dynamic and not static. Population numbers, distributions, structures and movements constantly change in time, in space at different levels. Population distribution describes the way in which people are spread out across the Earth's surface.

Most of the population (70%) lives on VituLevu, the largest of the islands and another 20% live on Vanua Levu. About half 44% of the population lives in urban areas. Suva, the capital, is the largest city and has a population of more than 200,000. Lautoka is the second largest city, Labasa, Lami, Nasinu, Nausori, Sigatoka, Tavua, Vatukoula, Rakiraki and Nadi are other towns which are increasing as more people practice urbanization. Lack of freshwater means that a number of islands in Fiji are uninhabited.

The distribution as seen from the above discussion is uneven and there are often changes over time.

Population density describes the number of people living in a given area, usually a square kilometer (km²)

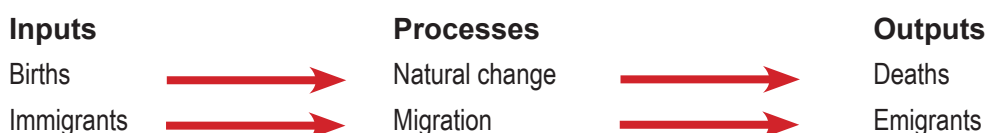
There are parts of Fiji which are sparsely populated and others are densely populated. Usually there are reasons why an area is sparsely or densely populated. Such reasons include physical factors, climate, vegetation, soil, water supply, resources, economic factors, political factors, diseases and pests.

Activity

1. Differentiate between **population distribution** and **population density**.
2. Select two reasons why an area may sparsely or densely populated to explain the pattern of population density of an area you are familiar with.

Population Change

As already stated populations are dynamic. Population change can be studied as an open system with inputs, processes and outputs.

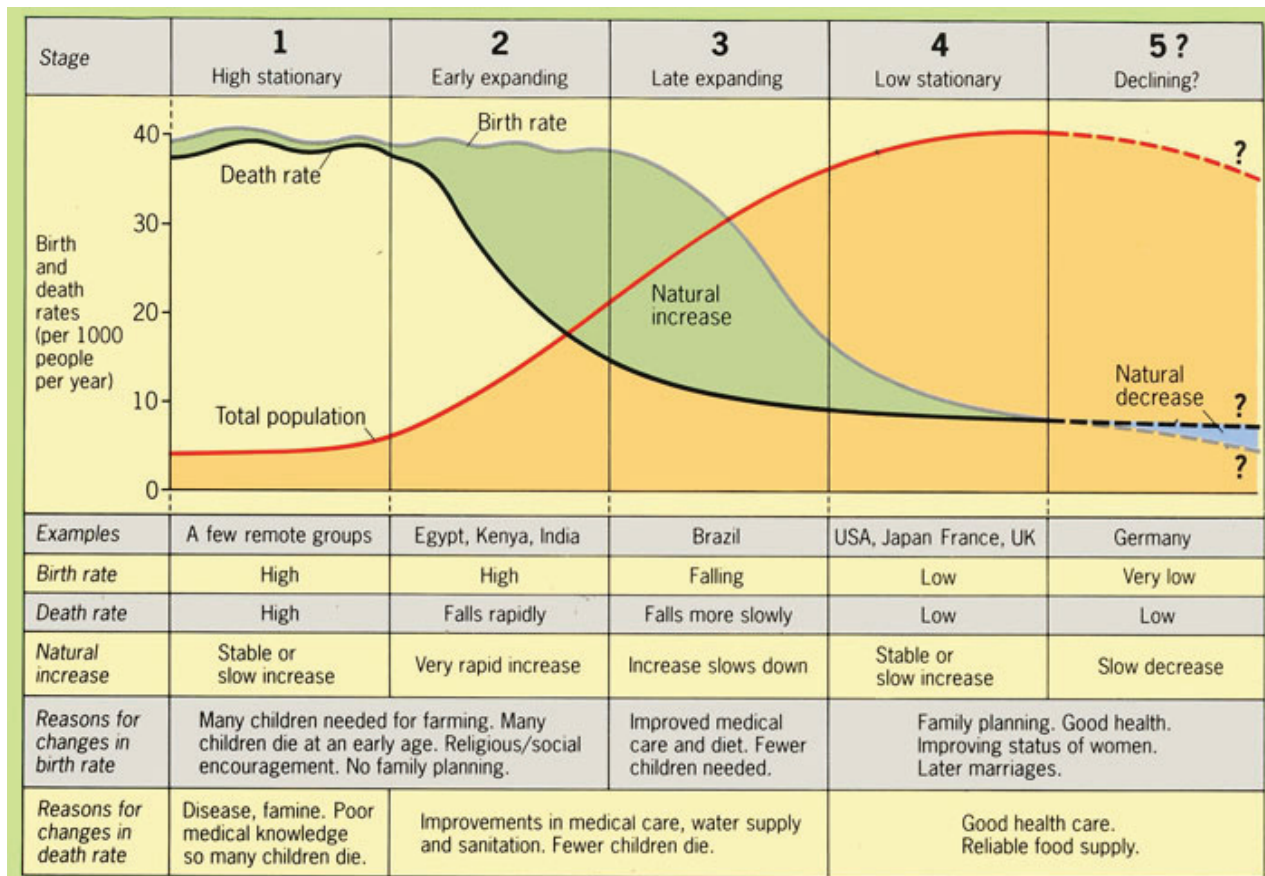


The **total population** of an area is the balance between **Natural Increase** and **Migration**.

Natural Increase = Birth Rates – Death Rates

Crude Birth Rate is the number of live births per 1000 people per year and the crude death rate is the number of deaths per 1000 people per year. Over the years Birth Rates have nearly always exceeded Death Rates. Any natural change in the population is usually expressed as a percentage and referred to as the Annual Growth Rate.

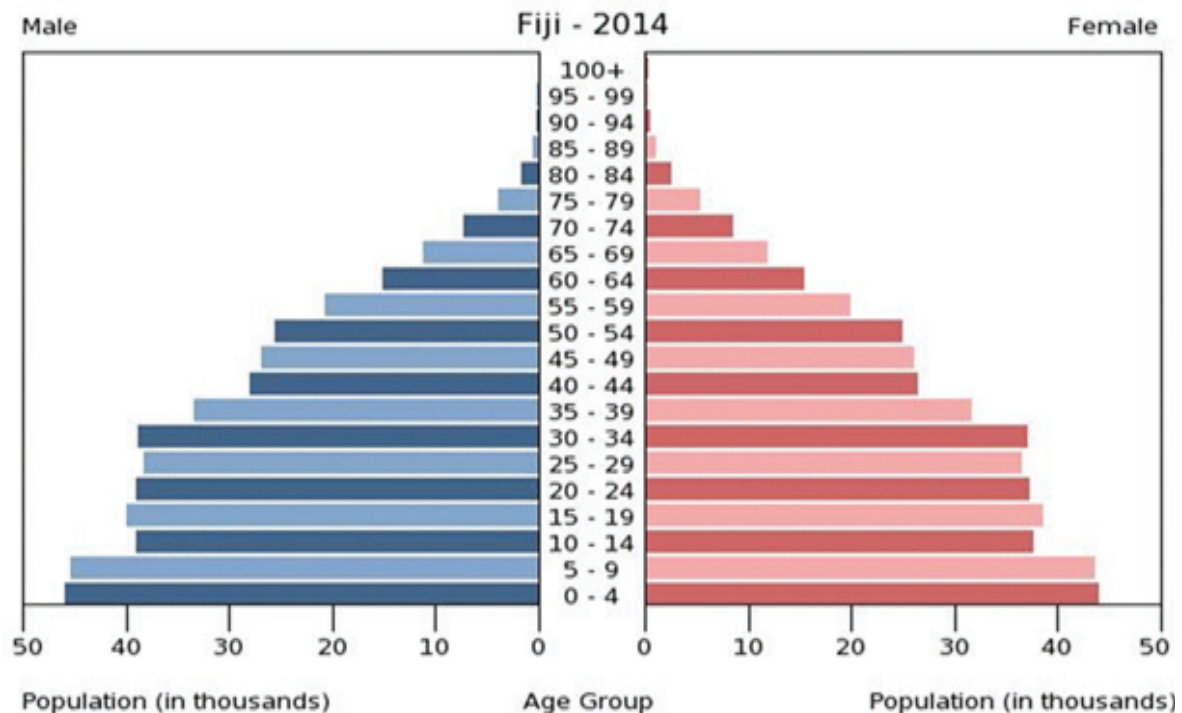
The **Demographic Transition Model** describes a sequence of change over period of time in the relationship between birth and death rates and overall population change.



Source: www.coolgeography.co.uk

Population Structure of a country is best illustrated by an **age-sex pyramid**. The population is divided into 5 year age groups (0-4, 5-9, 10-14.....) on the vertical scale and into males and females on the horizontal scale. The number in each age group is given as a percentage and is shown by horizontal bars; with males located on the left and females to the right of the central axis.

Population Pyramid of Fiji



Source: www.indexmundi.com

Culture and identity

People of Melanesian and Polynesian descent settled Fiji about 3,500 years ago. They are now called the "Lapita people" after a distinctive type of fine pottery they produce. European settlement began in the 17th and 18th centuries. About 60,000 Indians were brought to work in the sugar plantations between 1879 and 1916 and thousands more Indians migrated in the 1920s and 1930s. The Indo-Fijian population formed the core of Fiji's business class. At present the population is made up of i-Taukei - predominantly Melanesian with a Polynesian admixture, (51%), Indo-Fijians (44%) and European, other Pacific Islanders, Chinese and others make up the remaining 5%.

Indigenous Fijians or the i-Taukei follow their traditional rites and practices, which include mekes (narrative dances), bure (house construction), yaqona (kava ceremonies), masi (bark or tapa-cloth) making, ibe weaving mats from pandanus and pottery. Indo-Fijians follow traditional Indian dances and music. Fiji has a small but strong writers' community.

Dependency ratio

The population of a country can be divided into two categories according to their contribution to economic productivity:

- i. **economically active /working population** (those aged 15-65 years)
- ii. **non-economically active** (dependent) population (those under 15 and over 65)

$$\text{Dependency Ratio} = \frac{\text{children (0-14) \& elderly (65 \& over)}}{\text{those of working age}} \times 100$$

Health

A comprehensive health care system exists in Fiji and Fijians also use herbal medicines.

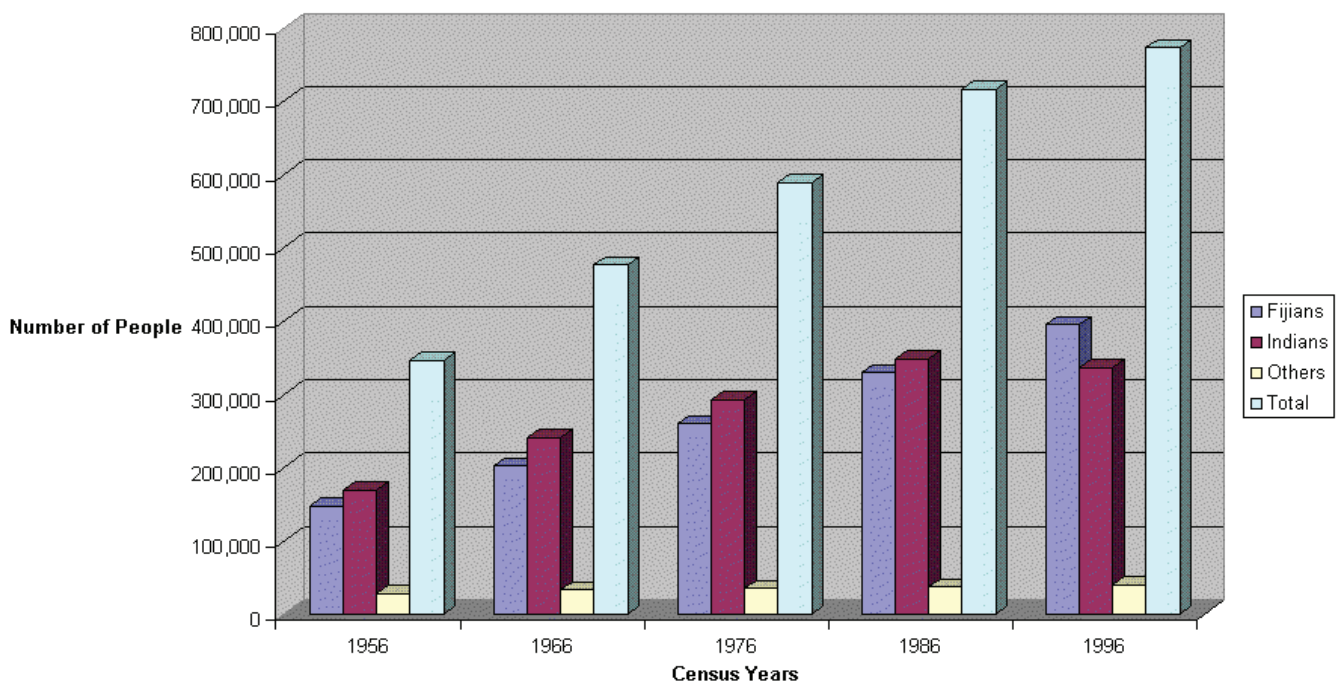
Unlike other tropical countries Fiji is free of malaria and yellow fever.

The country guards itself against human, animal and vegetable pests and diseases through an effective quarantine system.

Compared to other developing countries, the infant mortality rate is low at 12 per thousand live births, population growth rate is low at 1.4% and life expectancy at birth is high at 70.5 years. Access to improved water sources is low at 47% while 72% of population has access to sanitation.

Around 90% of one year olds are immunized against tuberculosis and 70% are immunized against measles. There is a low, 0.01% rate of HIV.

Fiji Population by Ethnic Origin



Activity

1. Describe the trend shown in the diagram above.
2. What is the census and why is it carried out?

Population	883,125 (July 2011 est.)
Age structure	0-14 years: 28.9% (male 130,409/female 124,870) 15-64 years: 65.9% (male 297,071/female 284,643) 65 years and over: 5.2% (male 21,187/female 24,945) (2011 est.)
Median age	total: 26.9 years male: 26.7 years female: 27.1 years (2011 est.)
Population growth rate	0.798% (2011 est.)
Birth rate	21.11 births/1,000 population (2011 est.)
Death rate	5.9 deaths/1,000 population (July 2011 est.)
Net migration rate	-7.24 migrant(s)/1,000 population (2011 est.)
Urbanization	urban population: 52% of total population (2010) rate of urbanization: 1.3% annual rate of change (2010-15 est.)
Sex ratio	at birth: 1.05 male(s)/female under 15 years: 1.04 male(s)/female 15-64 years: 1 male(s)/female 65 years and over: 0.81 male(s)/female total population: 1 male(s)/female (2011 est.)
Infant mortality rate	total: 11 deaths/1,000 live births male: 12.12 deaths/1,000 live births female: 9.82 deaths/1,000 live births (2011 est.)
Life expectancy at birth	total population: 71.31 years male: 68.73 years female: 74.03 years (2011 est.)
Total fertility rate	2.61 children born/woman (2011 est.)



Multiracialism is an important element in Fiji's growth and success. [Primary Source]

I Taukei- 57.3% (predominantly Melanesian with a Polynesian admixture), Indo Fijians- 37.6%, Rotuman 1.2%, other 3.9% (European, other Pacific Islanders, Chinese) (2007 census)



Sunday school students of Delaivalelevu in Suva during Palm Sunday.[Primary Source]

Protestant 55.4% (Methodist 34.6%, Assembly of God 5.7%, Seventh-Day Adventist 3.9%, Anglican 0.8%, other 10.4%),

Hindu 27.9%, Roman Catholic 9.1%, Muslim 6.3%, Sikh 0.3%, other or unspecified 0.3%, none 0.7% (2007 census)

Languages: English (official); Fijian (official);

total: 13 years School life expectancy

Hindustani

(primary to tertiary education)

Definition: age 15 and over can read and write

total population: 93.7%

male: 13 years

male: 95.5%

female: 13 years (2005)

female: 91.9% (2003 est.)



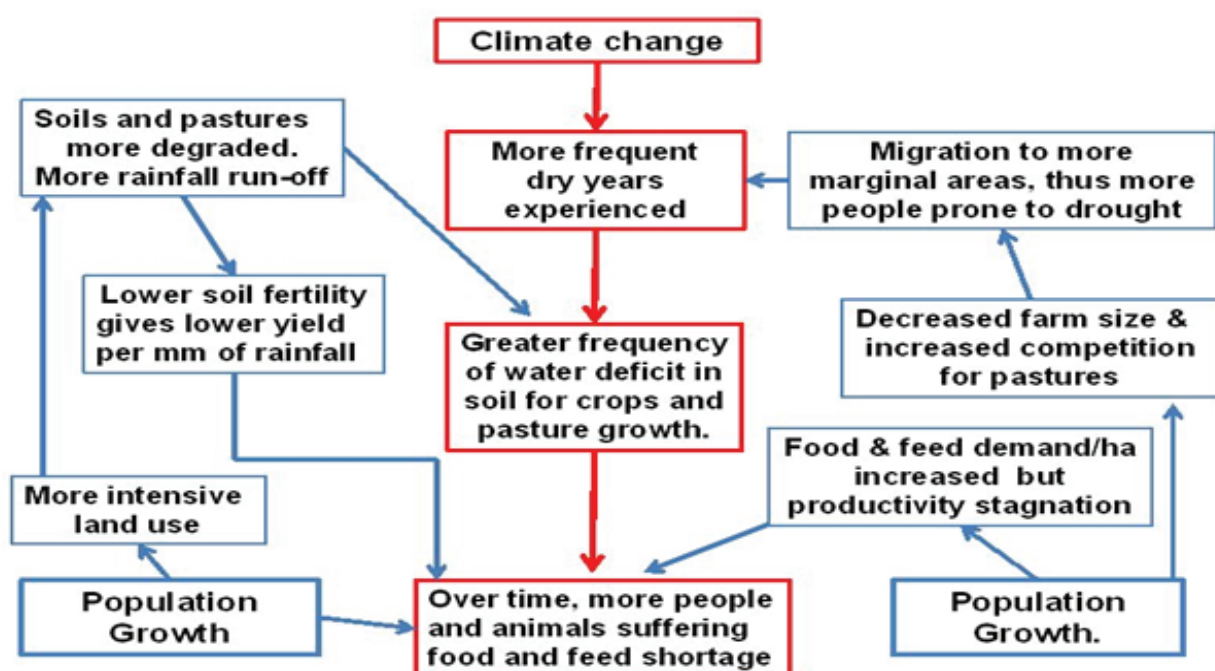
Jasper Williams High School students (Form 6A, 2011) in Lautoka, Fiji. [Primary Source]

Activity

- What do you understand by the following terms:
 - birth rate
 - death rate
 - natural increase
 - net migration
- The Demographic Transition Model is divided into 4 or sometimes 5 stages. Give four reasons why there may be a:
 - fall in Death rate in Stage 2
 - fall in Birth rate in Stage 3
- Explain what may happen if both Birth and Death rate remain low.
- Do you think there can be a Stage 5 where Birth rate falls below Death rate resulting in a declining population? What can be the implications of this type of population change on the government?
- Name a country in the world where population is increasing rapidly, discuss 2 social and 2 economic problems the increase may cause. What can be done to address the problems highlighted?

RELATIONSHIP BETWEEN POPULATION GROWTH AND CLIMATE CHANGE

Demographic trends have an important connection to both the challenges and solutions to the problem of climate change. Rapid population growth strengthens the vulnerability to the negative consequences of climate change, and exposes growing numbers of people to climate risk. Population growth is also one of the drivers of the growth in greenhouse gases that contribute to climate change. Meeting people's needs for family planning and reproductive health builds resilience to climate change impacts. Meeting family planning needs will also stem population growth, easing challenges associated with adapting to climate change impacts and reducing the growth of greenhouse gas emissions.



Source: http://populationaction.org/wp-content/uploads/2012/02/PAI-1293-Climate-Change_compressed.pdf

An Urban Study of Suva

Location

Suva is located in the South East of VitiLevu and is situated on a peninsula. The city is built along the western side of the peninsula. In many places land has been leveled or reclaimed from the sea for further development.

The area of Suva is approximately 40 square km long and as urbanization develops and expands so as the population of the city and as a result the town boundaries too will expand.

Historical Development.

- 1882 the capital was shifted from Levuka to Suva.
- 1953 the population of Suva reached 30000 and it was declared city.

The present population is over 2000,000. (*Students can get latest population statistics*)

Pull Factors

Suva has been growing fast in terms of population and development. A lot of places have been used up as informal settlements. There are many reasons that pull people to the urban areas. In relation to migration to Suva the pull factors are:

- Many type of job opportunities
- Better facilities for higher education
- Better medical facilities
- Facilities for varieties of job opportunities.
- Young people are attracted to the bright lights.
- Peer pressure

Push Factor

Factors or reasons that push a person away from source areas in Fiji. Some reasons are:

- Lack of employment
- Poor living conditions
- Lack of good agricultural land
- Conflicts in the family over land
- Low grade facilities in the rural schools
- Poor medical facilities

The government should diversify all facilities and spread it out evenly in the rural areas so as to pull people back and not practice urbanization.

Reasons for not settling in Suva

- High cost of living such as high rents.
- Suva is overcrowded, busy and noisy.
- High crime rates so there is a lot of insecurity
- Unpleasant climate –too wet and too humid.
- Poor living conditions

Functional Zones of Suva

- Suva has a number of different reasons or functional zones where different activities take place.
- There has been an overlap as the city has developed.
- The town planners have divided the area into different zones such as the Central Business District (CBD), the Port Area, the Industrial areas and the residential areas.

The Central Business District

- The heart of the city lies on either side of the Nubukalou creek.
- This core area CBD contains the central post office, professional and commercial offices, banks, insurance companies, travel agencies, hotels and restaurants, embassies and the city civic buildings.
- High rents and pressure for space in the CBD have resulted in the building of high rise tower buildings.
- Land continues to be reclaimed from the sea to provide room for further developments.
- The bus station and the market are important features of the CBD.
- It is a buffer zone separating the Walu Bay Industrial area from the CBD.



Down town Suva

The Port Area.

- The port area includes the wharves, warehouses, customs sheds and offices, bulk stores and offices of shipping companies and gent.
- Suva is the main port of entry for imports and exports.
- Local shipping is handled at the Princess Wharf at Walu Bay.
- The Kings and Queens and other wharves have facilities to cater for vessels, tankers, roll on /roll off passenger vessel ad general cargo ships.
- There are also facilities for boat-building and slipway can handle vessels of 1000 tonnes.



Source: www.fijisun.com.fj

The Industrial Areas

- The first min industrial zone at Walu Bay.
- Food processing, marine engineering, ship building, brewing and light manufacturing was established.
- The PWD and some construction firms were also based there.
- Because of the lack of space near the city centre, newer industries have been developed at Raiwaqa, Raiwai, Vatuwaqa, Laucala Beach Estate and Wailada in Lami.
- Cement manufacturing is done in Lami.(students can identify new places where this is done)

Residential Areas

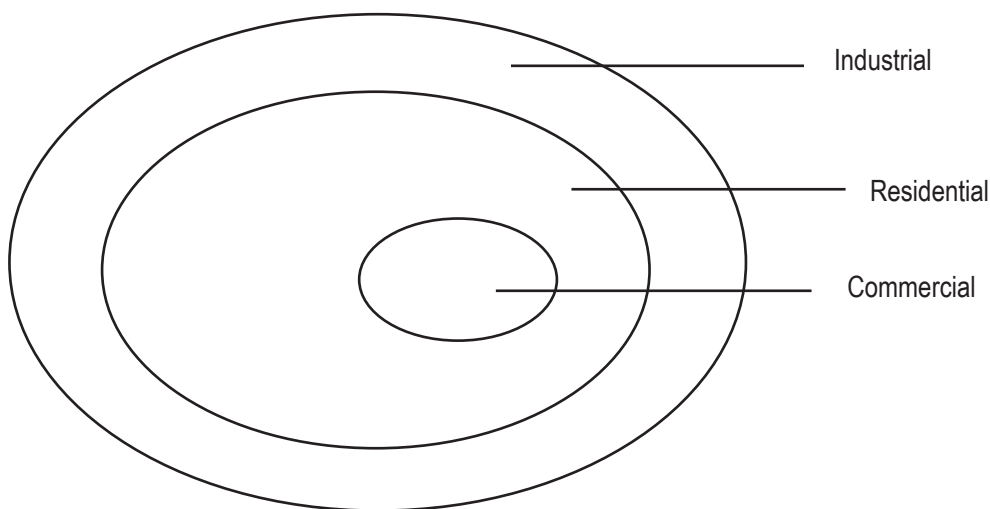
- Housing covers the greatest are of Suva's Functional Zones.
- Residential areas vary a lot:
 - Toorak and Flagstaff are suburbs with a mixture of old and new housing
 - Muanikau, Namadi Heights and Laucala Beach have high class homes
 - Fijian villages at Tamavua, Suvavou, and Raiwai now surrounded by newer housing developments.
 - Informal housing or squatter settlements are widespread in Suva.
 - The residents do not own land
 - Standards of living in most cases are very low due to overcrowding, poor sanitation and water supply.

Other Functions of Suva.

- Suva is the centre of government, an important educational and cultural centre.
- The new parliament building has been sited at Nasese.
- Most government departments are located in the Southern part of the city.
- Bright light such as the Village Six Cinemas, Nightclubs and other attractions are what draws people to the city and therefore accelerates urbanisation.

Factors Affecting Land-Use Patterns

Urban Land-Use commonly looks like this:



Key Factors:

1. Land Value

- Centre of cities is the most expensive land
- Land value tends to drop as you move away from the centre
- CBD at the city's core— central business district
- Characterized by high-rise buildings, generates high amounts of money, accessible location
- High density development
- high land value along major roadways
- house lots are smaller today because of land value

2. Zoning

- created by municipal government
- used to control development and avoid land use conflicts

3. Technology

- land use reflects technology available at the time of development
- since WWII, urban areas have wider arterial roads to move traffic, winding local roads to slow traffic, larger parking lots
- Before WWII, housing was high density, after it became low density

4. Climate

- Winter-City Concept: build cities with usable inside and outside environments though the winter
- Includes: undergrounds walkways, connected buildings, indoor shopping malls, bus shelters, glass walls to allow sunlight in
- Climate considered when building public spaces

DISASTER RISKS IN URBAN CENTRES

Disaster Risk Management describes; “The systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster.” (UNISDR)

An important component of DRM is Disaster Risk Reduction which is; “The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to Hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events.” (UNISDR)

The other integral component of DRM is Disaster Management (DM) which is; “the component which involves the planning, leading and controlling of activities related to the management of disasters in any of its phases and stages”

In 1990 Fiji established the National Disaster Management Office (NDMO) which is the coordinating centre of the Government of Fiji in times of natural disasters. The NDMO operates under the jurisdiction of the Natural Disaster Management Act (1998) which provides an institutional structure and regulations for the implementation of disaster preparedness programmes, disaster mitigation programmes and disaster response and rehabilitation detailed in the National Disaster Management Plan (1995). The Roadmap for Democracy and Sustainable Socio-Economic Development 2010–2014 includes a goal to “reduce vulnerability to disasters and risks and promoting sustainable development”. The strategy recognises the need to increase emphasis on a comprehensive approach to disaster reduction including improved community preparedness and disaster mitigation, and the integration of the impact of disasters into national development planning.

In the context of urbanisation, disaster risk increases as a result of badly planned and managed urban development, degraded ecosystems and poverty. As Fiji's population increases, disaster risk – such as landslides, floods and fires destroying homes and taking lives increases in the urban areas.

The quality and capacity of city governance has an enormous influence on the disaster risk its people faces, a city with a good urban and environmental plan, and its services and infrastructure in place, can prevent disasters better than one that does not.

Let us look at one case study to illustrate what has been done in Fiji to address disaster risk in urban centres or towns.

Navua Town

Navua township is situated on the flood plain of the Navua River, Fiji's third largest, which drains a catchment area of 1070 cubic kilometres. Floods in 2003 and April 2004 caused wide-ranging and serious damage to crops, livestock, houses, roads and bridges. Hundreds of people lost their homes and belongings. The 2004 floods caused FJD 90 million in damage to medical supplies and equipment from Navua hospital which is situated immediately next to the river banks.

The way that human settlements around the flood plain have developed has helped transform a natural hazard into a disaster. Flooding of the Navua River is associated with prolonged and intense rainfall, which is common during the wet season from November to April. However, increased flooding of the area has also been attributed to build-up of sediment at the mouth of the Navua River, which raises the riverbed and increases the river's potential to burst its banks. Studies and field surveys suggest that several development processes are exacerbating flood risk: Abandoned irrigation channels built in the 1990s; unsustainable land usage; deforestation of land around the upper catchment of the Navua River; aggregate mining in the river and; dredging of the river for mining and to control flooding.



Source: carbon-based-ghg.blogspot.com

Results

- Disaster risk reduction education and public awareness campaigns are being carried out, including through workshops held with local government.
- Gender-sensitive Vulnerability and Capacity Assessments have been conducted for provincial or district development.
- Disaster risk reduction is being integrated into provincial development planning and budgeting.
- A flood warning system is being implemented. Under an EU funded project called 'Reducing Vulnerability of ACP States', SOPAC- one of the implementing partners of this project – had already worked with the Fiji National Disaster Management Office, the Public Works Hydrology Division, the Fiji Meteorological Services, and the Provincial Administrations of Serua and Namosi to implement a flood warning system in the Navuaregion.
- A flood response plan has been developed.
- Local government and community capacity has been developed.
- Relationships have been built between local government, traditional leadership (the chiefly system) and the national government.

The good practice

- The initiative promotes the investment of national and provincial funds in disaster risk reduction.
- Different institutionalized processes of central and traditional government are being respected.
- Communities are analyzing their own risks, vulnerabilities and development priorities, and addressing them from within instead of relying on external forces. This has been achieved by using participatory methods.
- Gender-sensitive participatory methods are ensuring women's participation and that their voices are heard.
- Local government representatives with planning and disaster risk management responsibilities are being trained in disaster risk reduction.
- An advocacy and awareness strategy on disaster risk is being developed for local level use.
- Community action plans are aligned with the capacities and resources of the communities.
- There is now better communication and interaction between local and national government representatives through joint workshops, training, meetings and participation in a Steering Committee.
- Traditional local leadership mobilized communities.

Challenges

- As there were many changes in staff, not only within the partner agencies but also within government, it was a challenge to maintain the momentum of the project over time, and to maintain continued commitment of all stakeholders and implementing partners to work , to have dedicated officers in charge of the project circle, and one person from the working group who is constantly at the project site.
- It can be a challenge to increase understanding and acceptance of disaster risk reduction among government officials and traditional leaders. Community hierarchies and cultural constraints had to be well-managed.
- Agencies were not able to allocate funding for the project, and there were competing priorities for partners.
- Political change at national level, and poor facilities, were also disruptive.

Devastation caused by disasters in urban centres



Devastation in Nadi Town
Source: www.fijitimes.com



Activity

Study the pictures below and use your knowledge to complete the table that follows :

Pictures depicting problems created by rapid population growth

a.



www.echinacities.com

b.



<http://www.fijione.tv/pacific-news/part60/>

c.



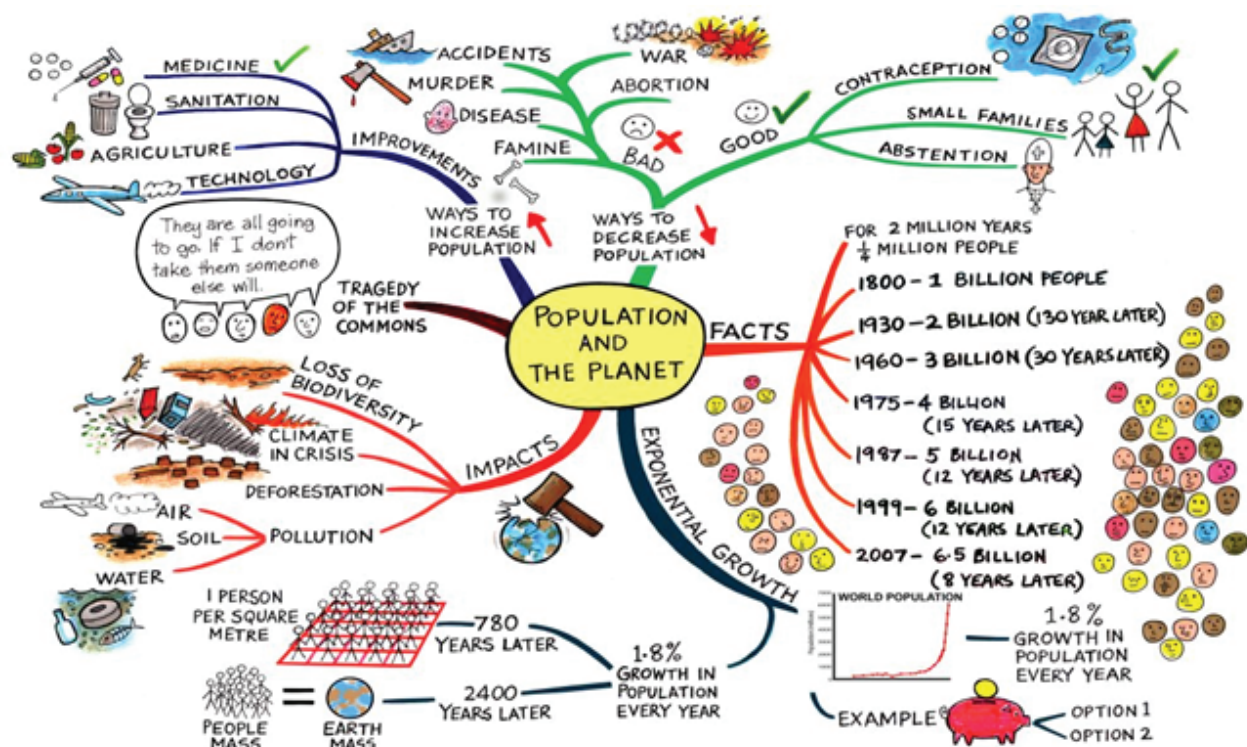
d.



www.ideas42.org/does-poverty-create-new-psychological-burdens

PICTURE	PROBLEM IDENTIFIED	CAUSE(s) of PROBLEM	WHERE THE PROBLEM CAN BE FOUND IN FIJI	SOLUTION TO PROBLEM
A				
B				
C				
D				

Use the model below and your knowledge to answer the questions that follow.



- State 4 environmental impacts of population growth and describe solutions to the problems.
- State 3 ways to increase population and 3 ways to decrease population.
- In your own words discuss what you understand by the term "tragedy of the commons".
- Describe the relationship between exponential population growth and
 - food production and
 - carrying capacity of an area.

MIGRATION

Migration is the movement of people from one place to another. The movement can be temporary or permanent. In Fiji there is internal and external (international) migration. Internal migration refers to population movement within a country, whereas external migrate involves a movement across national boundaries and between countries. Examples of internal migration include the movement of people from:

- smaller islands to the main islands
- small islands to small islands
- rural to rural
- urban to urban
- rural to urban
- urban to rural

Types of Migration

Permanent	External Migration (international) 1. voluntary 2. forced (refugees) Internal Migration 1. rural depopulation 2. urban depopulation 3. regional
Semi-permanent	For several years
Seasonal	For several months/several weeks
Daily	commuters

Voluntary migration occurs when migrants move by choice. Such movements are usually influenced by push and pull factors. When people have no choice but to move from an area due to environmental, economic, religious, political or social factors, migration is said to be forced.

Why do people return to Fiji after they have migrated?

- Racial tension in the new area
- Earned sufficient money to return
- To be reunited with their families
- Foreign culture proved unacceptable
- Better opportunities in Fiji
- Retirement

Activity

1. Discuss the effects of rural-urban migration on (i) rural areas and (ii) urban areas.
2. What can the government do to reduce/control rural-urban migration?
3. Compare and contrast between refugees, asylum seekers and internally displaced persons. Give a specific example to support your explanation.