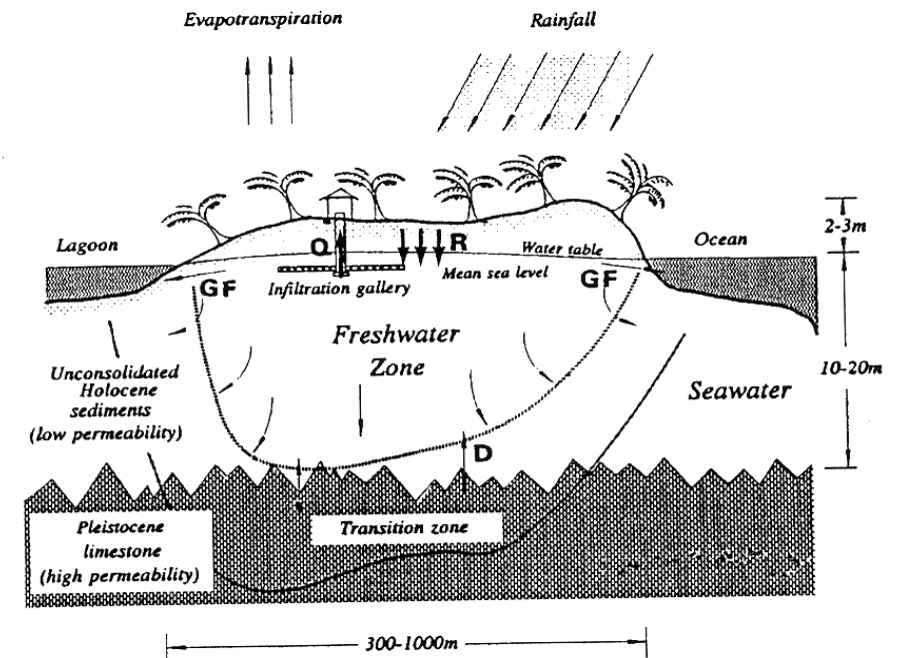
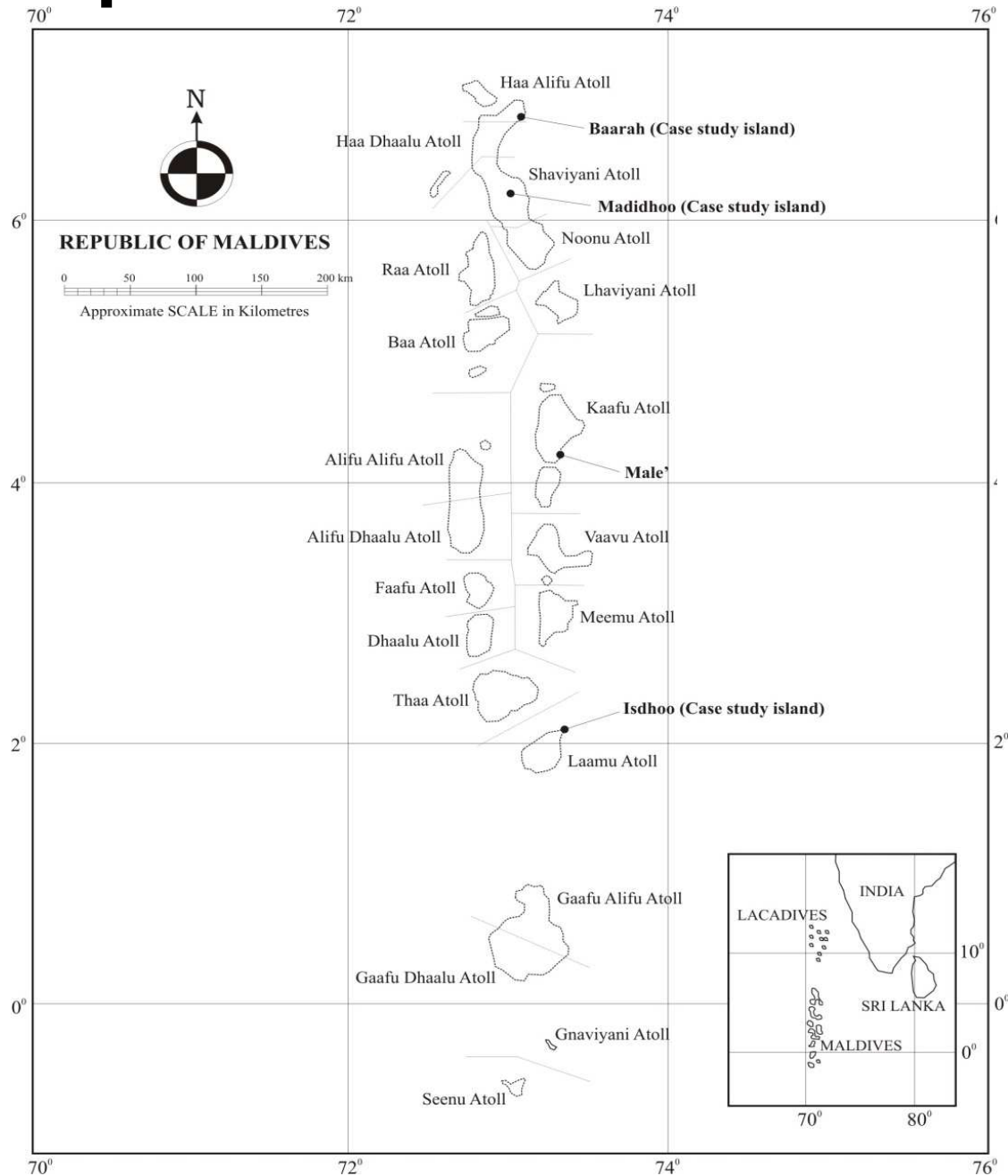


# Climate Change and Food Security in Maldives

*Ibrahim Shabau*

# Map of Maldives and Cross-section of an Atoll Island



*R is discharge from rainfall, Q is extraction for uses such as irrigation and industrial activities, GF is discharge to the sea or lagoon and D is loss due to tidally-forced mixing with underlying seawater. The groundwater is depleted by local household use, irrigation, uptake by island vegetation and lateral outflow into the sea.*

Source: White et al. (2004, p3)

# Introduction

- Important Socio-economic Indicators of Maldives*

S. N.	Items	Unit	Year	Total
1	Total Population	Number	2006	298,968
	(a)Male			151,459
	(b)Female			147,509
2	Total Population in Male'	Number	2006	103,693
	(a)Male			51,992
	(b)Female			51,701
3	Total Households (HHs)	Number	2007	46,194
4	Avg. family size per HH	Number	2007	6 – 7
5	Population growth rate	Percent	2006	1.69
6	Total area (land & sea)	Sq. km.	2006	90,000
7	Total cultivable land area	Ha.	2006	2,670
8	Islands	Number	2006	1,190
9	Inhabited islands	Number	2006	200

... continued overleaf

<b>S. N.</b>	<b>Items</b>	<b>Unit</b>	<b>Year</b>	<b>Total</b>
10	Natural atolls (clusters)	Number	2006	26
11	Administrative atolls	Number	2006	20
12	Smallest atoll	Sq. km.	2006	5.4
13	Largest atoll	Sq. km.	2006	2,800
14	Max. height above sea level	m	2006	3
15	Length of the country	km	2006	820
16	Width of the country	km	2006	130
17	Annual avg. rainfall	mm	2006	1948.2
18	Maximum temperature	° C	2006	30.4
19	Minimum temperature	° C	2006	25.7
20	Literacy rate	Percent	2006	98.0
21	Life expectancy	Years	2006	73

# Maldives VISION 2020 and Economic Growth

- Maldives is the “smallest” country in South Asia in agricultural land area and categorised within the Least Developed Countries (LDCs) by the UNDP. However, Maldives Vision 2020 aims at becoming one of the top ranking middle –income developing country by the year 2020 through its’ rapid social and economic development.
- Maldives has achieved rapid economic growth since 1975 and made impressive socio-economic progress evidenced by improvements in socio-economic indicators and reduction in poverty. During the last ten years (1986-1996), the rate of economic growth averaged 8.7 percent in real terms. The Government of Maldives (GOM) has played a key role in rapid growth of fisheries and tourism subsectors, which are the main foreign exchange earners of the country.

# Overview of Food Security in Maldives

- The food insecurity problem in Maldives has unique features. The key distinguishing feature is that Maldives depends on imports for most of its food requirements including the staple food rice and that income generated by two main activities, fisheries and tourism are being utilized for meeting the import requirements.
- Maldives' agriculture is generally characterised by its subsistence nature. The total area suitable for cultivation is estimated at less than 30 sq. km. Given the limited capacity for agricultural production, 90 percent of the country's food demand is fulfilled by imports making the country vulnerable towards food security (MPND, 2007).

# Overview of Food Security in Maldives

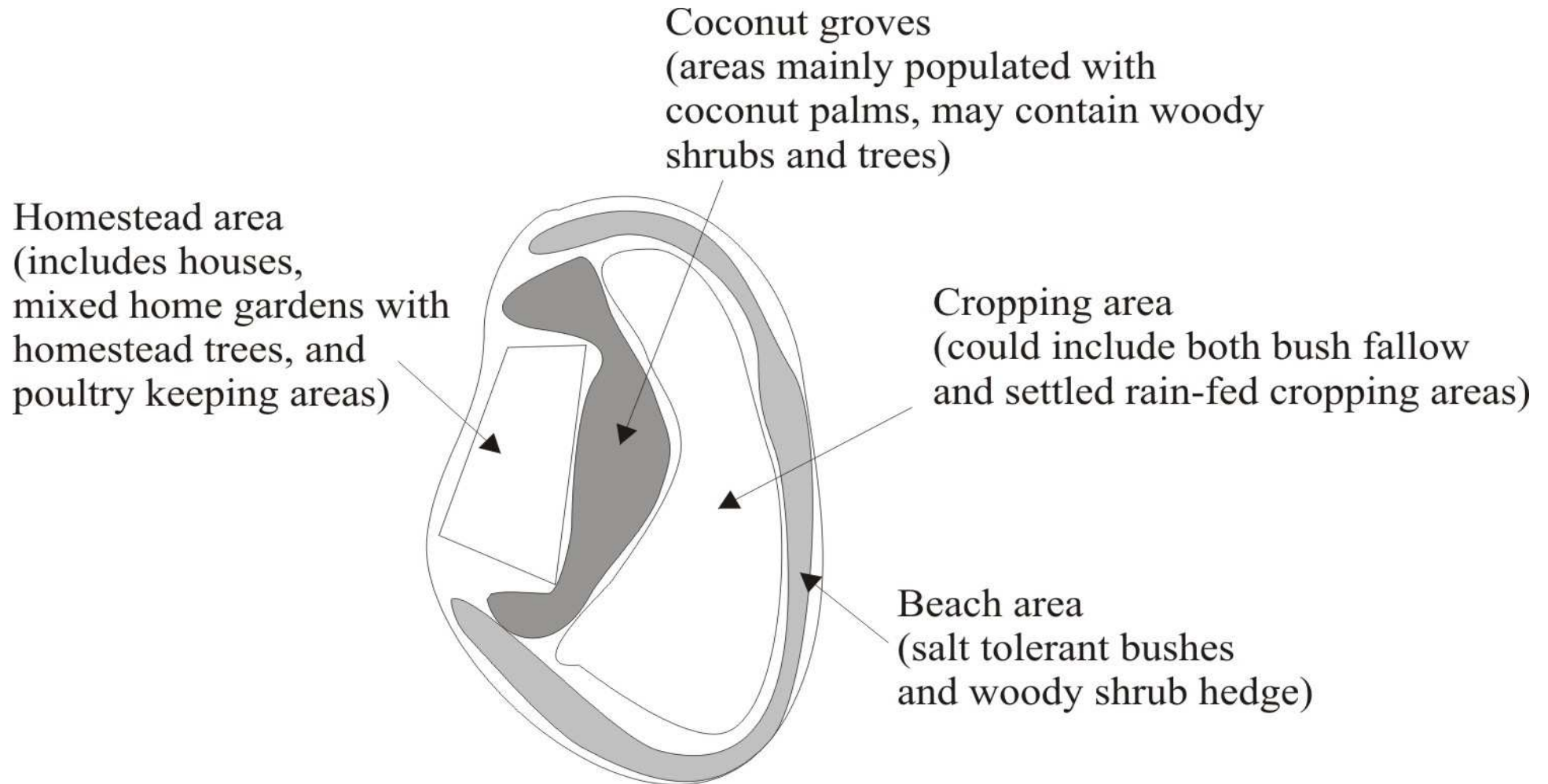
- The Maldivian economy was entirely dependent on fisheries and other marine products for many centuries and fishery and related activities remain the main occupation(s) of a significant proportion of people; the government provides priority to the development of the fisheries sector. At present, fisheries contribute over 15 percent of GDP and engage about 30 percent of the country's work force. Outside of Male', fishing is the main source of food security and livelihoods for the vast majority of the people (MPND, 2007).

# Agricultural Land use types in Maldives

Agricultural land-use type*	Scale of operation (land areas**)	Purpose of farming	Agricultural land-use	Remarks+
Mixed home gardens (backyard agriculture)	Small scale (approx. 90m <sup>2</sup> )	Subsistence and some cash sales	Perennials (coconuts, breadfruit, mango ...etc) + annuals (brinjal, chillies, tomatoes ...etc) + free-range poultry keeping at times	Most common land-use on agricultural islands; almost 50% of farmers have a mixed home garden; low input use. Home garden land available varies between islands
Settled rain-fed cropping	Medium scale (approx. 1000m <sup>2</sup> )	Subsistence and some cash sales	Taro pits + annuals like sweet potato, cassava + cereals (sorghum, millets) at times	Common on larger agricultural islands; about 60% of farmers use this system, usually in addition to having mixed home gardens; low input use; dependent on rain and limited irrigation
Bush fallow shifting cultivation	Small scale (approx. 200m <sup>2</sup> )	Subsistence and some cash sales	Taro pits + annuals like sweet potato, cassava + cereals (sorghum, millets) at times	Very much the traditional farming type and heavily dependent on rain; very few farmers practice this nowadays; very low input use
Year-round horticultural production	Medium to large-scale on agricultural islands (2000m <sup>2</sup> – 10,000 m <sup>2</sup> ); Large scale in government leased out islands (approx. 150,000m <sup>2</sup> per farm)	Commercial	Annuals like bananas, chillies, + short term vegetables + Sometimes livestock such as chicken and goats + Specialised crops like watermelon in commercial agricultural islands	New and widely accepted system of farming in the country; high input use; increasing numbers of farmers use this system; all government leased out commercial horticultural islands use this system; also on crop specialised larger agricultural islands All farms irrigated



# Distribution of land-uses on a typical agricultural island of Maldives



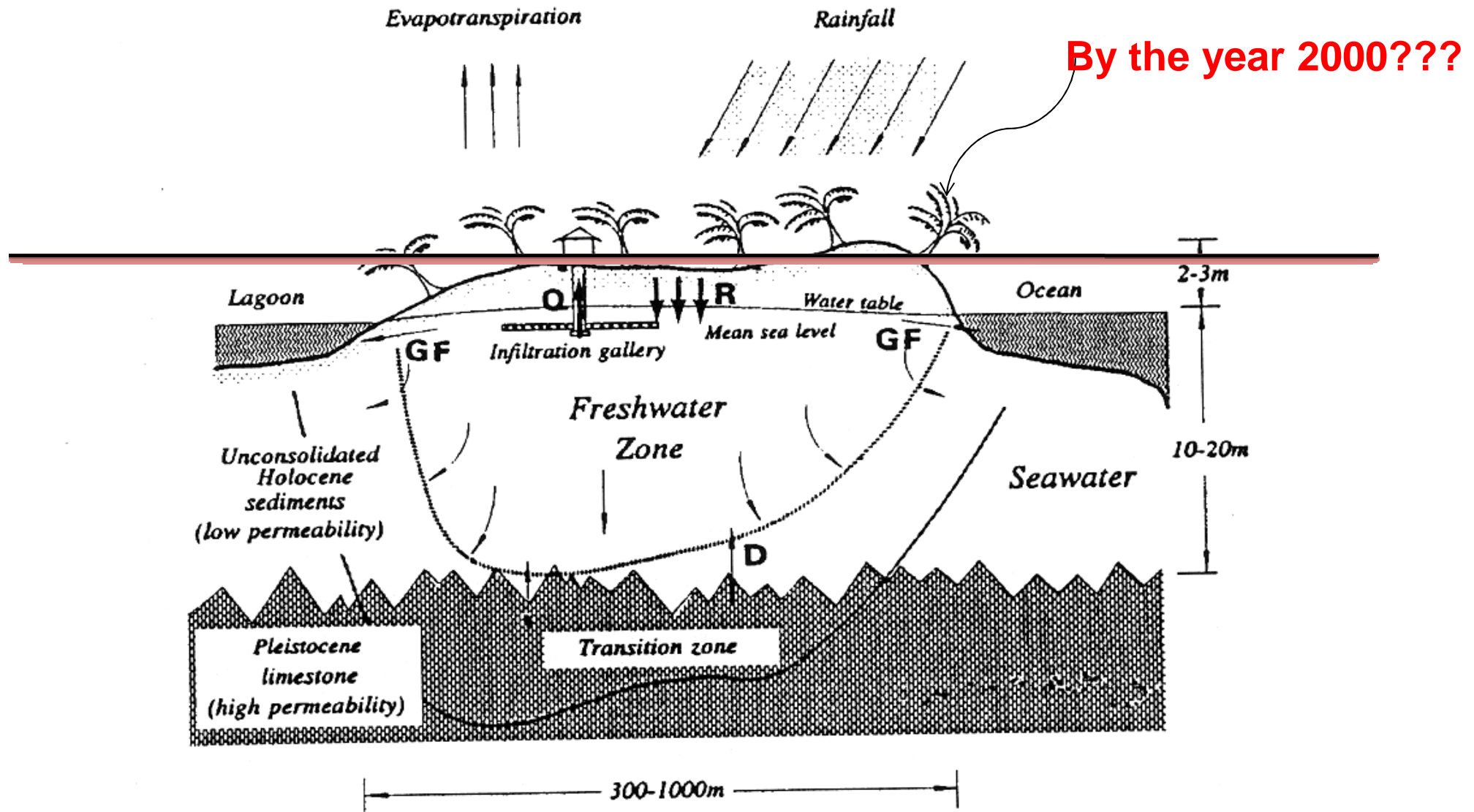
# Trends in Food Production, Consumption and Requirement

- Annual Fruit, Vegetable, Roots, Tubers, Nuts and Field Crops production have increased over the last 10 years with a minor slip in 2005 (after the 2004 Tsunami event)
- Annual Fish production and export have also increased
- Domestic fish, fruit and vegetable consumption increased
- Malnutrition (underweight, stunted and wasted) has decreased

# Issues and Challenges

- Agriculture and Fisheries Sector:
  - GDP trend in agriculture
  - Integrated long-term rehabilitation measure
  - Linking agriculture with tourism
  - Inefficient and high cost investment
  - Land improvement and soil fertility
  - Water salinity and scarcity of clean water
  - Empowerment of women in adopting technologies
  - Nutrition security at Household level
  - Poor access to Credit facilities
  - Enhancement of market information system
  - Environmental sustainability
  - Tsunami effects in fisheries
  - Post-harvest technology and efficient communication

# Climate Change and Maldives



# Potential Impacts of Climate Change on Maldives

- Loss of land area due to rising sea-levels
- Shifts in species competition and composition
- Coral reefs, mangroves and seagrass adversely affected, with negative affect on reef fish populations
- Increased salinisation of soil
- Increase number of storm surges, larger storm waves and more intense flooding events
- Adverse effects on crops due to changes in soil moisture, salinity and rainfall
- Decline in food security – adverse effects on crops and fish stock
- Coastal erosion and changing climatic conditions – may affect tourism
- Adverse economic impacts – infrastructural damages, coastal protection measures, and decreasing tourism
- Decline in human health trough vector-borne diseases and enhanced food insecurity



