

Preparation of Adaptation in the South Pacific

**- A Resource Book for Policy and Decision
Makers, Educators and other Stakeholders -**

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Collaborative Studies in the South Pacific

1991–1997 Assessment of Impact and
Vulnerability Coastal Zone Management
 – Tonga, Fiji, Samoa, Tuvalu

#A New Stage from Assessment to Response

1999–2000 Needs Assessment for Climate
Change

2001–2001 Editing the Resource Book
It will be published this year.

Common Needs and Problems Identified

<Sectors>

Coastal zone

Coastal communities

Natural disaster
management

Water resources

Agriculture and
aquaculture

Human health

Economy

Social Services

<Constraints/Needs>

Lack of data and information

Lack of technical capacity/
Technology

Lack of resources
(financial, technical, human)

Needs for national policy
framework

Needs for capacity building
and training

Needs Assessment– Adaptation

- Evaluation of **community level adaptations** found in the region.
- **Sustainable coastal zone management** in PIC communities.
- Enhancing existing **natural disaster management** in PICs.
 - Identify, evaluate and assess **adaptation options for coastal communities** affected by coastal erosion and at the risk of sea level rise.
- Identify, evaluate and assess adaptation options for **smaller islands' water sources**.
- Identify and evaluate adaptation options of **agriculture and health risk problems**.
- **Specialist training staff** in all sectors, government provinces and non-government organizations in understanding vulnerability of their respective sectors and how to adapt.
- Real adaptation options should be identified for vulnerable sites that have cultural, biological, economical and ecological

Purposes of the Resource Book

- 1) To provide **policy– and decision–makers** with a coherent, authoritative and readily accessible body of knowledge and resource materials:
 - region's resilience and vulnerability
 - potential response strategies/options
- 2) To provide **educators, outreach and related practitioners** with an integrated and functional resource portfolio:
 - formal education and professional development programmes
 - political and public awareness

Joint Project

Sponsored by Ministry of Environment, Japan

Coordinated by SPREP

International Editorial Board

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Taito Nakalevu: SPREP

Patrick Nunn: The University of the South
Pacific

Contents of Resource Book

1. Introduction
2. Climate and Sea-Level Variability and Change: **Processes and Projections**
3. **Consequences** of Climate and Sea-Level Variability and Change
4. Regional, National and Community-based Responses to Climate and Sea-Level Variability and Change – **Mitigation**
5. Regional, National and Community-based Responses to Climate and Sea-Level Variability and Change – **Adaptation**
6. **International Responses** to Climate and Sea-Level Variability and Chang

1. Changing Climate: Processes and Projections

1) Present status:

- The South Pacific; vibrant and dynamic
- extreme events (tropical cyclones, floods and draughts)
- El Niño–Southern Oscillation (ENSO)

2) Natural system and human societies:

- well attuned to large variations in the environmental conditions

3) Temperature rise: 0.6–3.5°C

- however, large uncertainty in specifying the future climatic conditions

4) More El Niño–like climate

5) Accelerated sea level rise





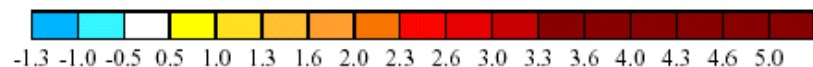
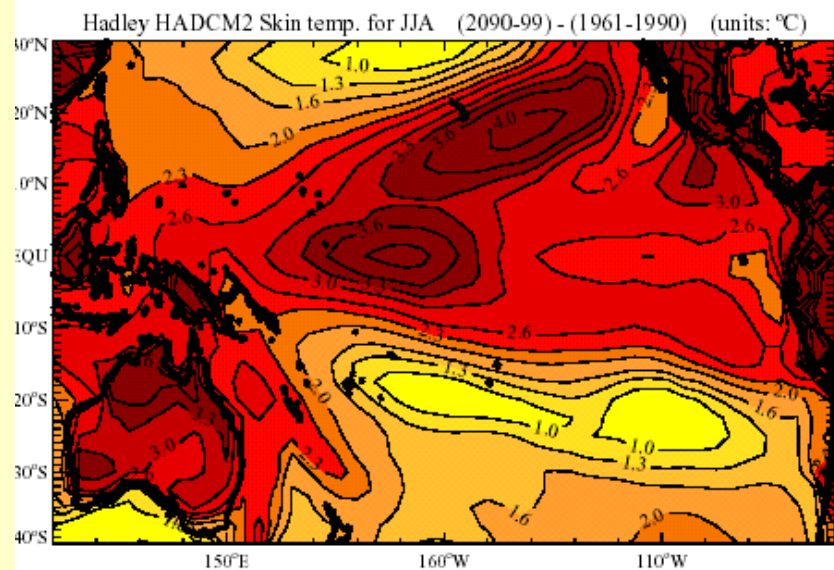
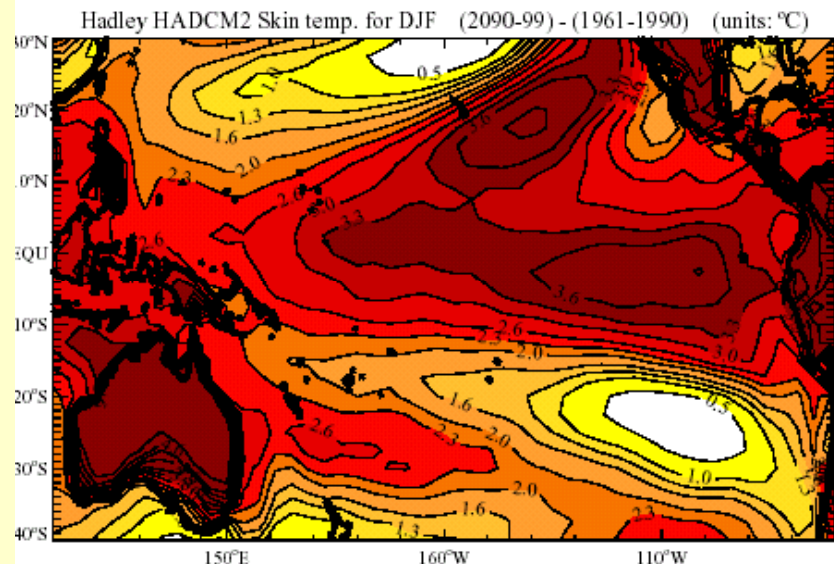






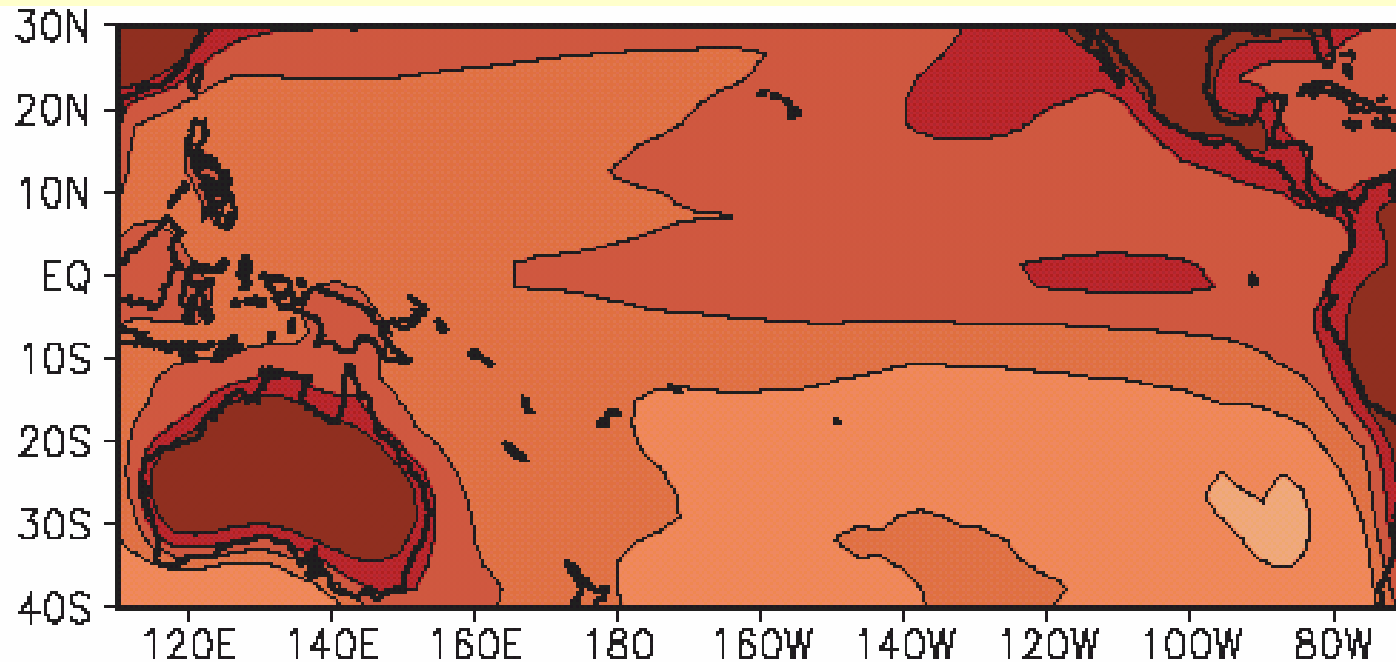


Projected changes in surface temperature 2090-2099/1961- 1990



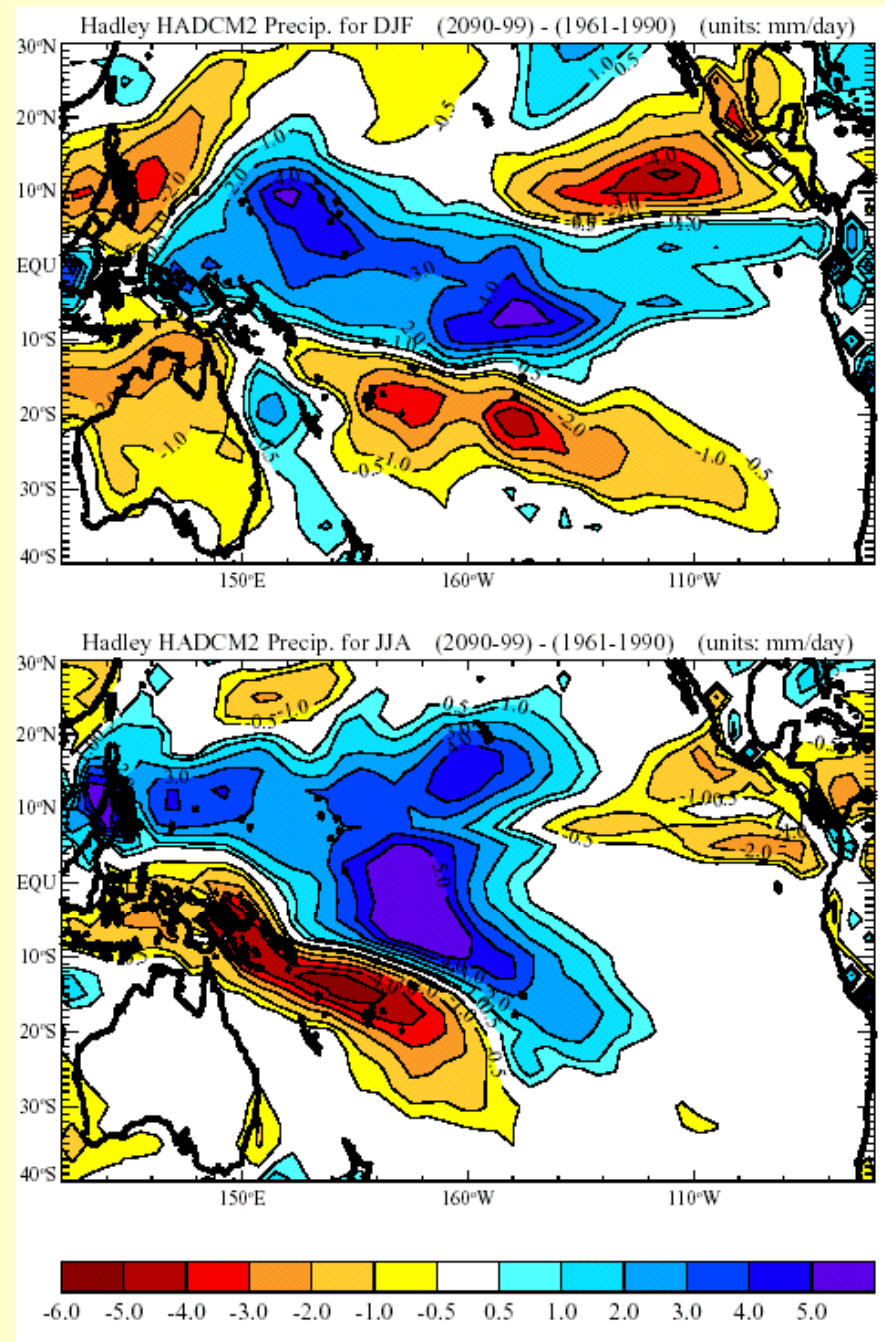
Projected changes in surface temperature

2071–2100/1961–1990

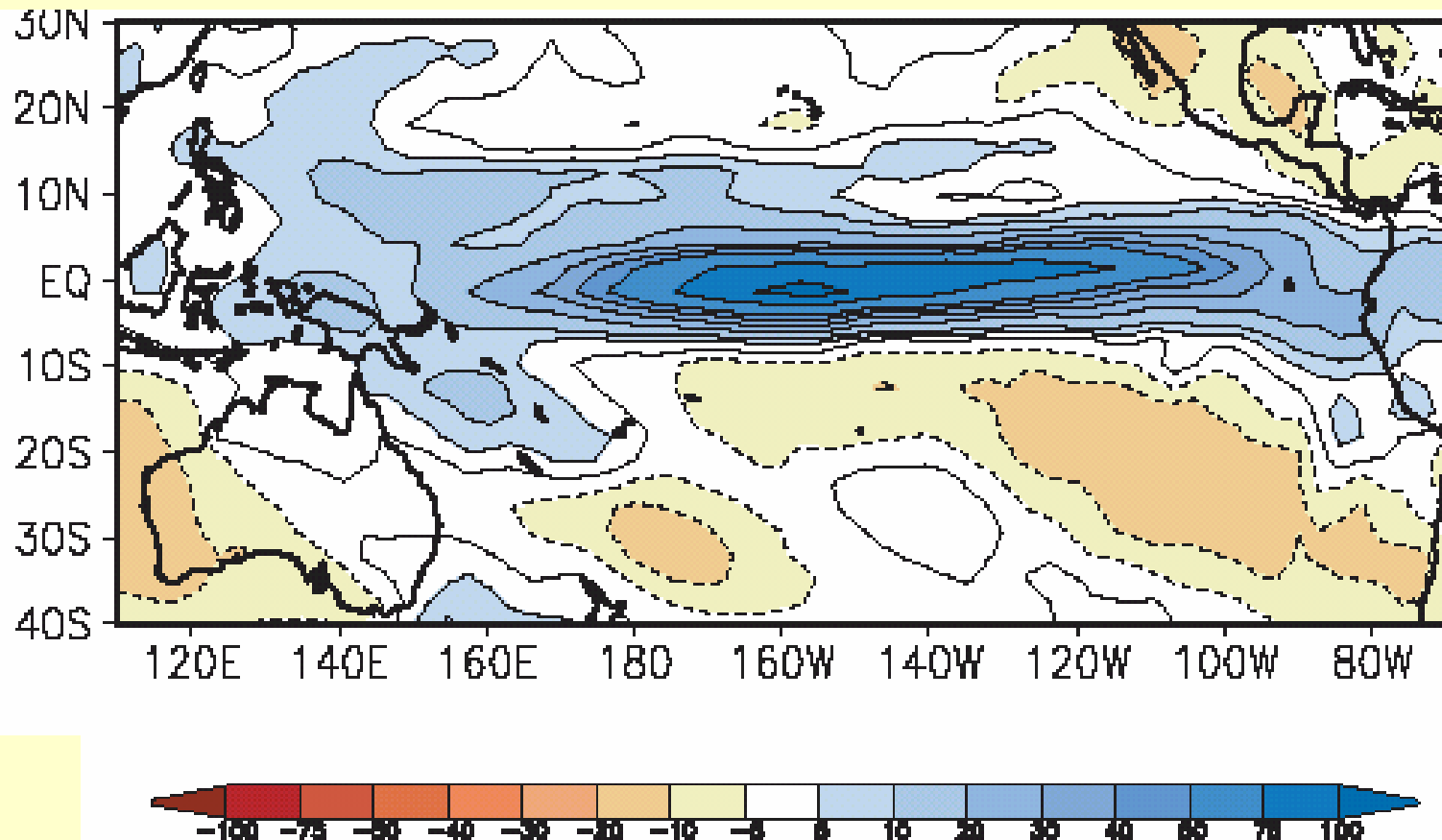


Projected changes in precipitation(%)

2090-2099/1961-
1990

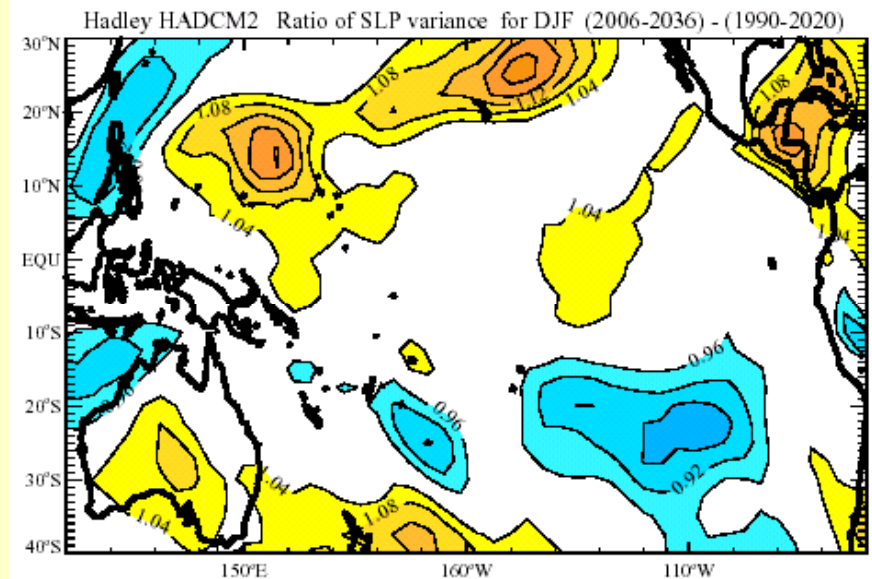


Projected changes in precipitation 2071–2100/1961–1990

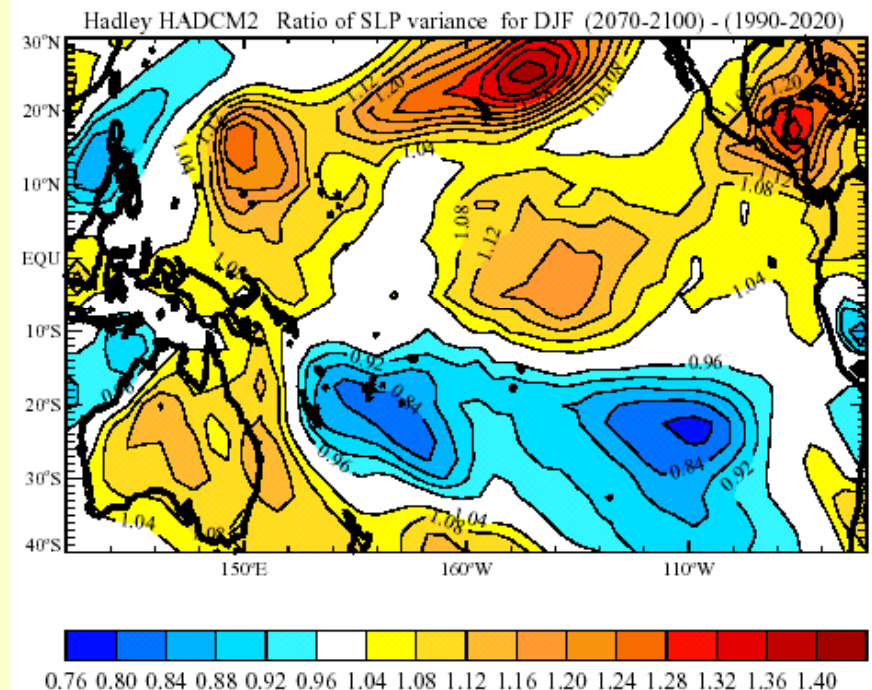


Index of storminess

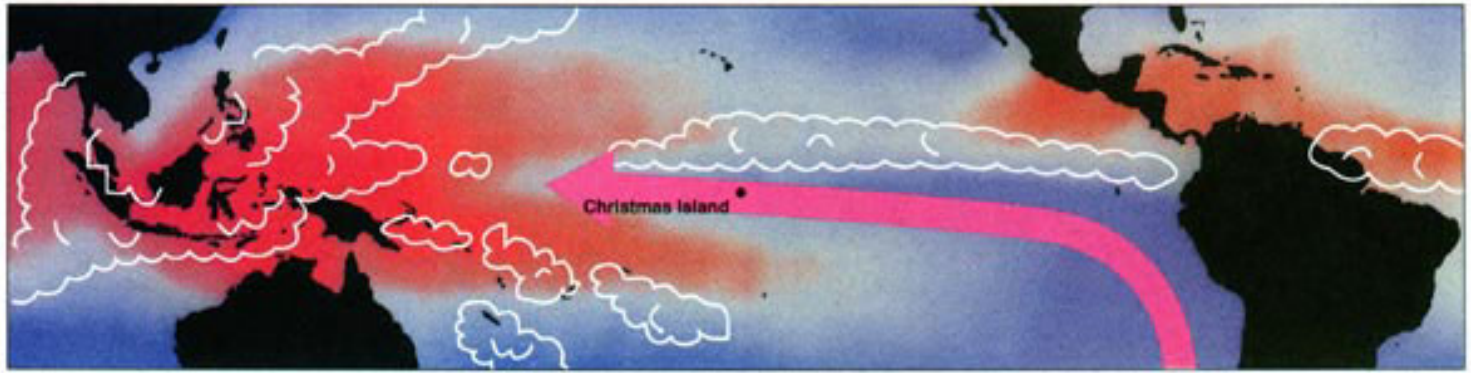
(a) 2006–2036/1990–2020



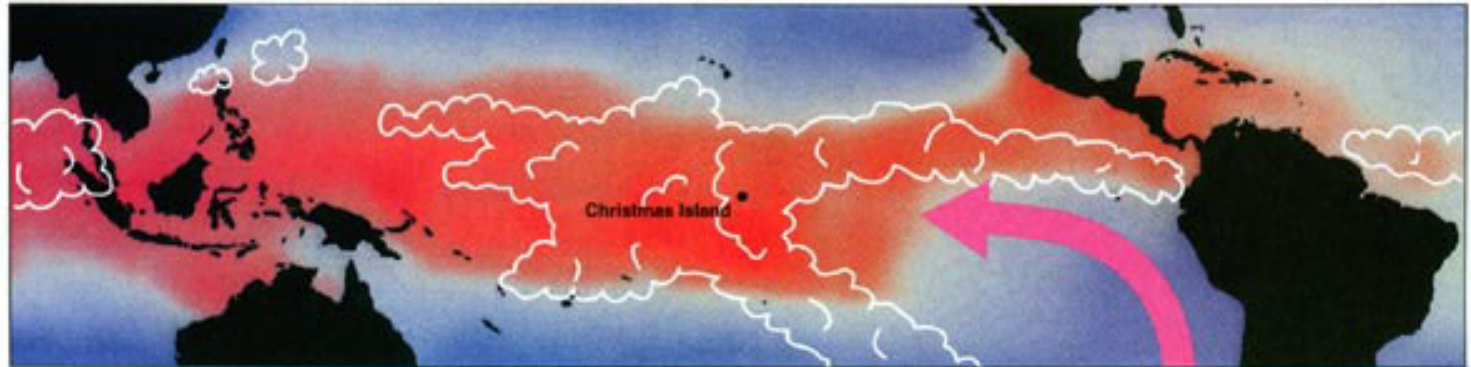
(b) 2070–2100/1990–2020



La Nina



El Niño



- Trade winds weaken
- Shifting pattern of tropical cyclones
- Sea level drop in the west, but rises in the middle and east
- Dry in the west

2. Impacts of Climate/Sea-level Variability and Change

- 1) Impacts of extreme events and climate variability
 - tropical cyclone, storm surge, flooding, draught, winds

e.g. impacts on agriculture and food security

- 2) Impacts of CC and SLR

- terrestrial and freshwater ecosystem
- coastal zone and marine ecosystem

coastal flooding
erosion

- water resources

Tarawa, Kiribati: decreased rainfall

50% reduction of groundwater recharge(2100)

- agriculture
- human health
- infrastructure
- economy and social services

3) Social trends: urbanization and centralization

- decreasing capacity of mutual support system in rural area
- cities – people and critical infrastructure at risk in

4) Economic loss

- Viti Levu, Fiji: US\$ 23–52 million(2–4% of GDP)
- GDP) – Tarawa, Kiribati: US\$ 8–16 million(17–35% of

5) The South Pacific: first victim and first to be forced to adapt

3. Mitigation

- 1) Region's nature: low emission from the region
 - Per capita CO₂ emission : 1 / 4 of global average
 - Major source: energy sector
- 2) Mitigation options
 - fuel substitution
 - energy efficiency
 - forestry

Pilot projects already started.
- 3) Collaboration of stakeholders
- 4) CDM
- 5) Though CO₂ emission is insignificant, mitigation should be pursued because of its valuable contribution to sustainable development.

4. Adaptation

- 1) Long-term policy to deal with both today's problem and future climate change
- 2) Indigenous technology vs imported technology
 - enhance resilience
 - reduce vulnerability
- 3) Incorporation to national policies
 - Disaster prevention/reduction plan
 - Environmental management plan
 - National development plan

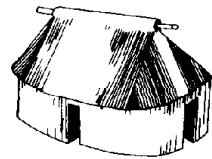
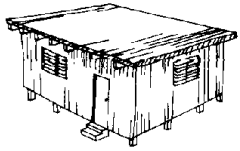
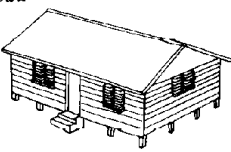
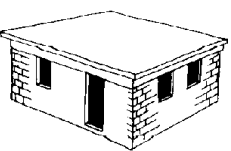
4) Reactive vs Anticipatory approach

- Anticipatory approach is desirable
 - range of response
 - cost
 - social acceptance

5) Adaptation of natural ecosystem

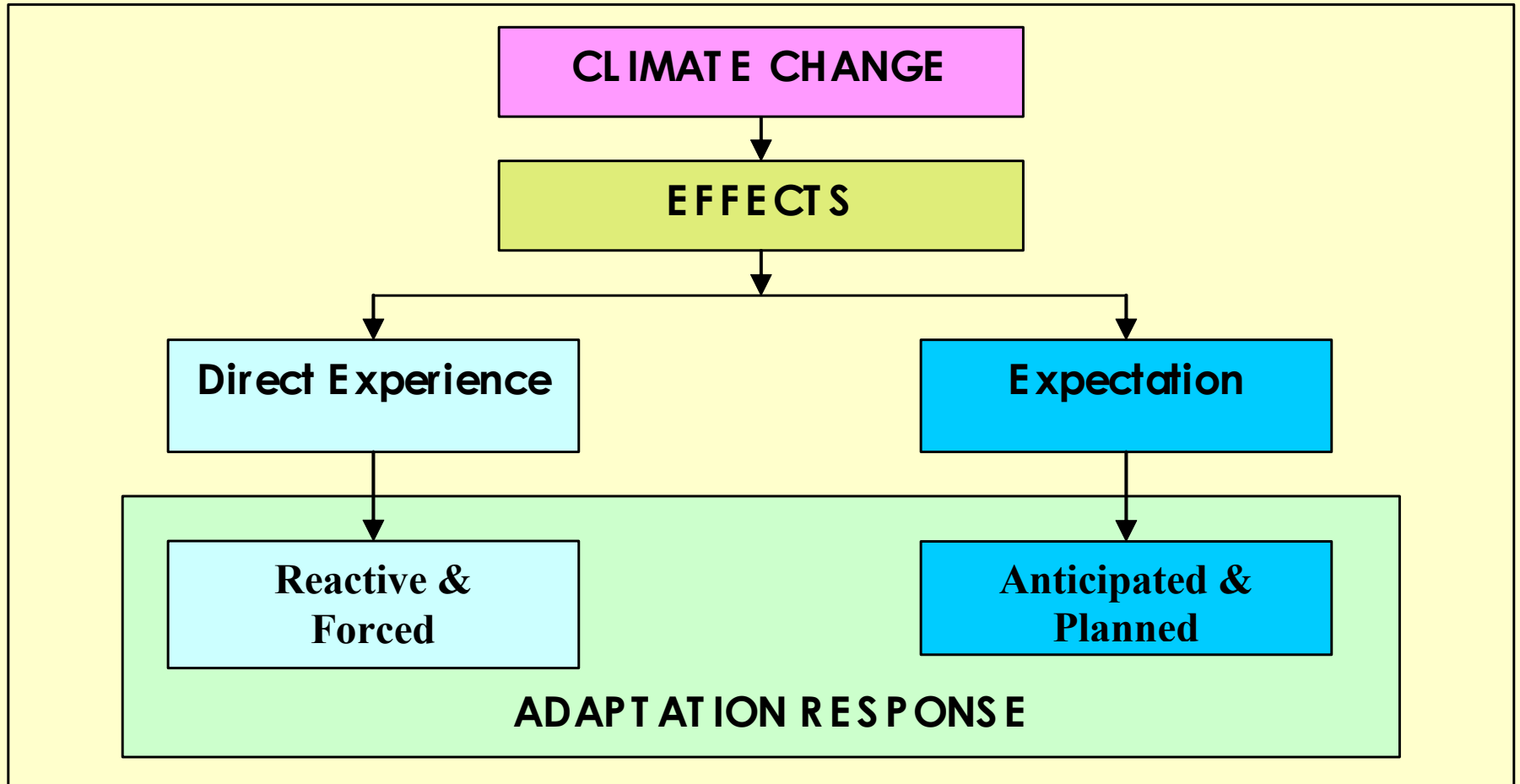
- PICs heavily depend on ecosystems
- Health of ecosystem enhances the ability to cope with CC.
- Institutional capacity, expertise

TABLE 2.10 Vulnerable Characteristics of Common House Types in Fiji

Type of House		Example
Fijian Terminology	Technical Terminology	
BURE	TRADITIONAL	
		
VALE VAKAKENANI	TRANSITIONAL	
VALE TUDEI	FORMAL	<i>Vale lalaga bitu</i> 
		<i>Vale kau</i> 
		<i>Vale simede</i> 

Materials	Common Characteristics of Houses in Fiji	
	Features that REDUCE Vulnerability	Features that INCREASE Vulnerability
Posts: indigenous hardwood Walls: woven bamboo reeds Roof: thatched pandanus, reeds, palm leaves	Strong hardwood corner posts Deeply sunk posts Steeply angled roofs Hipped roofs Small or no eaves Secure sennit bindings	Lack of rigidity in walls (with increasing distance from corners) Excessive spaces for air to enter Weakness in connections between corner posts and roof
<i>Modifications to Traditional Bure</i>		
Posts: downgrading of timber used (reduced availability of some hardwoods) Roof: corrugated iron	Wire bindings	Nails Increased size of eaves Iron sheets poorly fastened to roof trusses
Frame: local woods, sawn timber Walls: corrugated iron, masonite Roof: corrugated iron	Strong corner posts deeply sunk into ground (occasionally only)	Flat roof Short insufficiently anchored concrete or wooden piers Louvred windows Iron sheets poorly fastened to roof trusses Overhanging eaves Space between roof and walls
<i>Wood Frame with Bamboo Walls</i> Frame: local woods, sawn timber Walls: Bamboo (bitu) mats (also other types) Roof: corrugated iron <i>Wood Frame with Wooden Walls</i> Frame: local woods, sawn timber Walls: sawn timber Roof: corrugated iron <i>Concrete Block</i> Frame: reinforced corner columns (not always) Walls: concrete blocks Roof: corrugated iron	Posts anchored into ground Shutters Bolts, metal straps Walls securely attached to frame Can be made relatively airtight Corners well fastened Use of reinforcing and rebars (not always)	Short piers (concrete and wood) Louvred windows Nails Iron sheets poorly fastened to roof trusses Gabled roof Space between roof and walls Walls poorly fastened at corners Poor connection of wooden roof frame to walls Unreinforced or poorly reinforced walls Louvred windows Large overhanging eaves

Reactive vs Anticipatory Responses

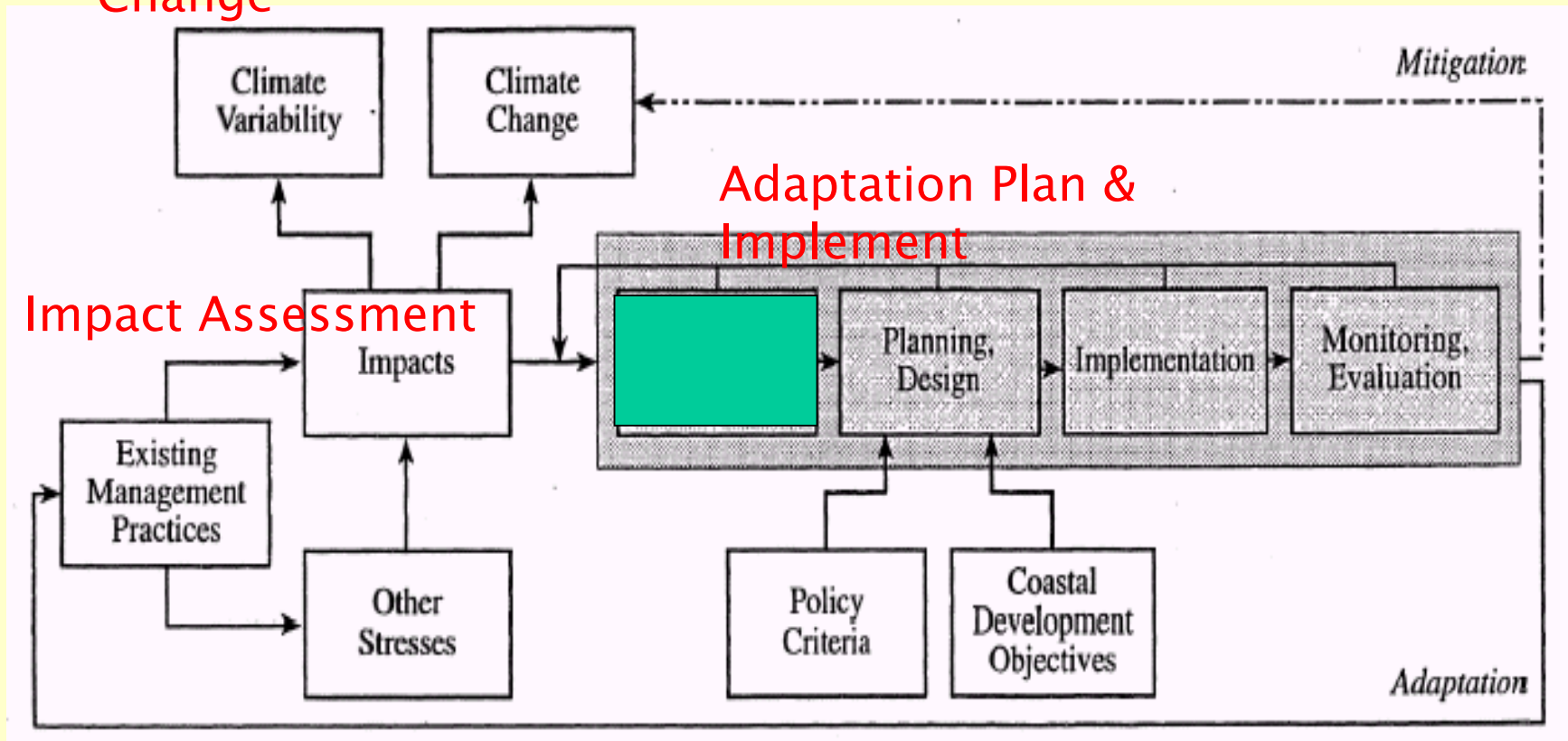


5. International Responses

- 1) UNFCCC/ Kyoto Protocol/ GEF
- 2) AOSIS
- 3) Barbados Programme of Action
 - Global Conference on Sustainable Development of Small Island Developing States
- 4) Monitoring network/ GOOS
- 5) Contribution of Pacific Island Countries
 - Regional action
 - Collaboration of Meteorological Services
 - Renewable energy development/aforestation

Response to Climate Change

Monitoring/Prediction of
Climate Variability &
Change



- guidance to policy-makers
- raising people's awareness

Conclusions

- 1) PICs in the Pacific are sensitive microcosms of the Earth. They are a bell wether for the rest of the world.
- 2) The combination of current and future impacts of climate variability and change is of great concern. PICs will be the first victim and first to be forced to adapt.
- 3) Adaptation is the major response for PICs.
- 4) The most desirable adaptive responses are those that address the adverse impacts of present day climate variability and actions which would be taken in the absence of climate change.
- 5) Adaptation policies should be incorporated in the mainstream policies, such plans as disaster reduction, environmental management, and national development.
- 6) **Resource Book** is expected to be used to promote

If you are interested in the Resource Book, contact with;

Taito Nakalevu:

SPREP

John Hay :

The University of Waikato

Nobuo Mimura:

Ibaraki University, Japan

Sister publication:

“Sea-Level Rise Data Book 2000”

Available from Center for Global Environmental
Research

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