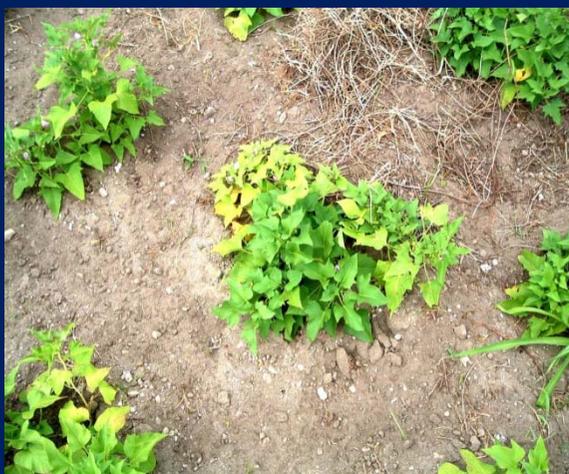




Regional Training Workshop on Adaptation for the Pacific Least Developed Countries,
28 September – 3 October 2012, Funafuti, Tuvalu

“ CLIMATE CHANGE IMPACT ON AGRICULTURE AND FOOD SECURITY ”



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PRESENTATION OVERVIEW

- **Challenge for Agriculture & Food Security**
- **Significance of Agriculture**
- **Impacts of Climate Change on Agriculture**
- **Climate Change Adaptations**
- **FAO Assistance to Climate Change**



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Population ↑



Food demand ↑



Resources ↓



Global Trade ↑

Global Challenges for Agriculture & Food Security



Climate Change ↑



Pests & diseases ↑



Biodiversity ↓



CHALLENGE FOR PACIFIC ISLANDS

- **The Pacific Island Countries (PICs) have limited resources (land & water) , biosecurity capacities and more vulnerable to the;**
 - **impact of climate change**
 - **globalisation of trade and market uncertainties,**
 - **and the spread of introduced weeds, pests and diseases, and invasive species.**



The Pacific Islands are the most vulnerable to climate change due to its geographical remoteness and size. Scientists have projected that by 2100 Pacific Islands would experience:

- sea-level rise by about 0.39metres,
- surface air-temperature to increase by 2.3°C,
- rainfall could either rise or fall with predicted impacts of 8.36% to 20.2%,
- El Nino conditions possibly more frequently,
- tropical cyclones becoming more intense,
- saline intrusion into freshwater lenses,
- increased flooding



AGRICULTURE IN THE PACIFIC ISLANDS

**Agriculture is vital and central to PIC's economy
with contribution of:**

- **Major food source**
- **Raw materials supply for manufacturing**
- **Source of income**
- **Contribution to GDP**
- **Foreign Exchange**
- **Employment**



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Agriculture in the LDC countries

Country	Land Area (km ²)	Sea Area (‘000 km ²)	Total Population (,000)	Agricultural Contribution to GDP (%)
Kiribati	726	3 550	83	17
Samoa	2 934	120	177	14
Solomon Is.	29 785	1 340	432	40
Vanuatu	12 189	680	177	20
Tuvalu	26	757	10	24



The Key Challenge for PICs

What are the Impacts of Climate Changes on Agriculture & Food Security?

- Agriculture production will be affected by increasing temperatures, changing rainfall patterns, and more frequent and intense extreme weather events.
- These will have direct effects on crop growth and their need for water, as well as soil fertility, water supply for irrigation, and prevalence of pests and diseases. In terms of livestock, climate change also will affect the quality and amount of feed supply and water.

Climate hazards will affect agriculture through;

- heat stress on plants,
- changes in soil moisture and Temperature
- loss of soil fertility through erosion of top soil,
- less water available for crop production
- changes in height of water table
- salinization of freshwater aquifer,
- and loss of land through sea level rise.

The consequences of such impacts are likely to be particularly severe in the atoll islands (Tuvalu & Kiribati) because agriculture is already under stress due to poor soil, limited available land, and water scarcity.

Tropical Cyclones and Storms



Cyclones are a significant cause of lost agricultural production. For example, Cyclone Ami caused over US\$35 million in lost crops in Fiji in 2003. Cyclones Ofa and Val, which hit Samoa in 1990/91, causing losses of US\$440 million, which was greater than the country's average annual

Severe Drought



Severe drought presents problems for agriculture everywhere in the Pacific region. Pacific agriculture more rainfed and lack of irrigation. Tuvalu had experienced that in 2011.

Wind and water causing soil erosion



Poor road construction induce soil erosion after heavy rain with top soil being drained off to coastal area.

Cyclone or flood damages to key infrastructure



Increased risk of flooding in river catchments also threatens food production. Heavy flooding of the

Cyclone or flood damages to key infrastructure



Damages to roads, bridges, storage, water supply and market infrastructures can upset the effective

Pest and disease outbreaks

Changes in rainfall patterns, temperature and wind direction could result in the establishment and emergence of new pests and diseases threatening agriculture & food security.

- **Samoa's experience with outbreak of Taro Leaf Blight in 1993 - 95% reduction in taro production**
- **Taken 16 years to breeding for resistant varieties and resume exports.**



The Key Strategies

FAO recognizes that these two challenges must be addressed together through;

1. Sustainable management of natural resources

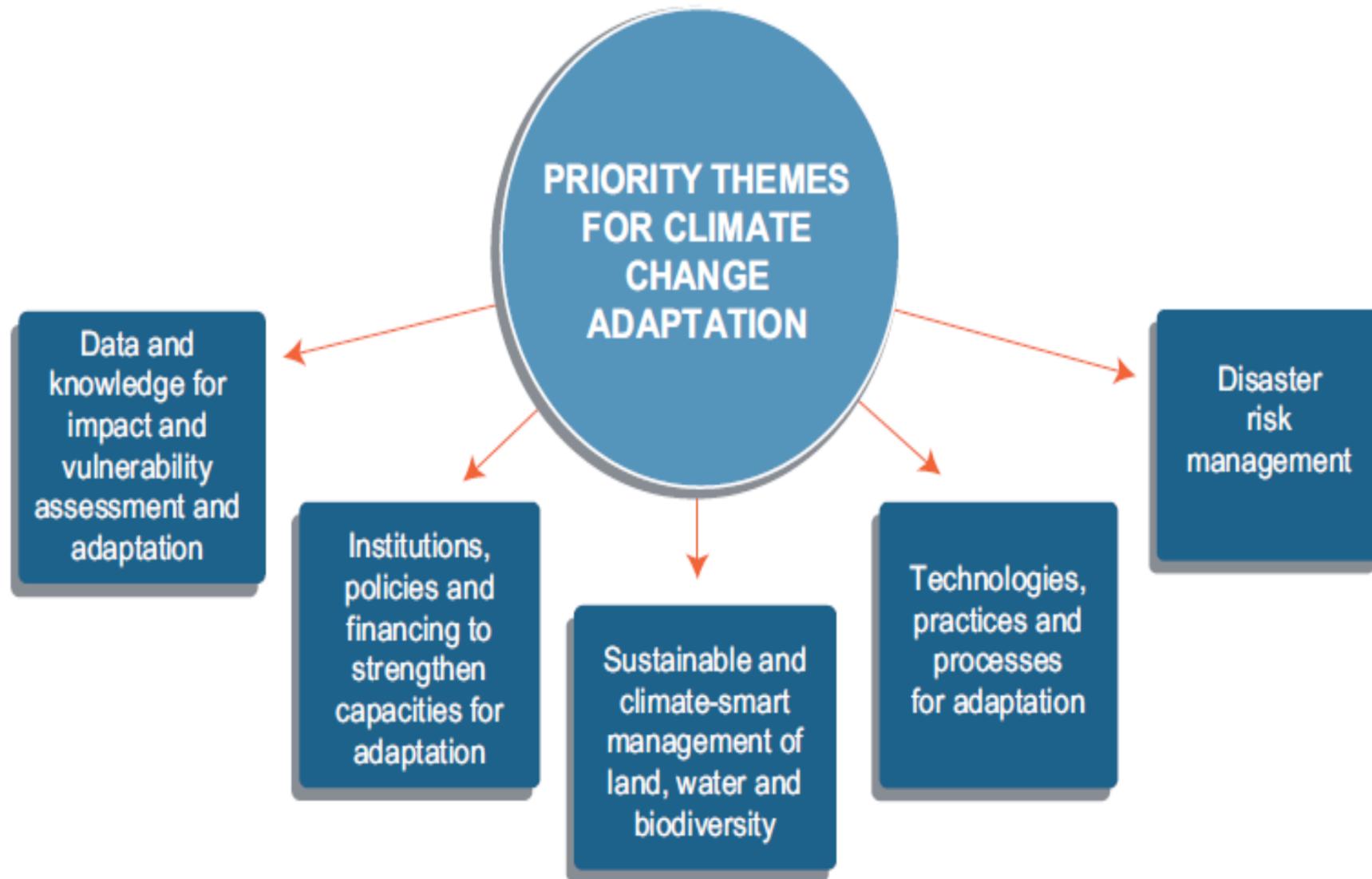
2. Climate change adaptation,

a must for the agricultural sectors to achieve food and nutrition security.

FAO-ADAPT - FAO'S Framework Programme on Climate Change Adaptation

- In 2009, the World Summit on Food Security recognized the challenges climate change presents to food security and request support to adaptation and mitigation efforts in agriculture, as well as efforts to increase the resilience to climate change, with particular attention to small agricultural producers and vulnerable populations.**
- FAO developed a Framework Programme on Climate Change Adaptation, called FAO-Adapt is a concrete tool towards achieving these goals.**
- FAO-Adapt will help enhance this support by mainstreaming climate change adaptation into all FAO**

FAO-ADAPT - FAO'S Framework Programme on Climate Change Adaptation



FAO-ADAPT PRIORITY ADAPTATION THEMES & ACTIONS

1. Supporting impact assessment and adaptation with data and knowledge.

FAO has developed a wide range of innovative, user friendly data systems and tool for assessing climate impact and vulnerability, and for planning adaptation strategies.

2. Strengthen institutions, and assist countries in implementing adaptation priorities.

FAO assists member countries in integrating climate change into national agriculture, forestry, and fisheries sector policies, and food security programs. Support countries in developing and implementing priorities and NAPAs.

3. Sustainable and climate-smart management of land, water and biodiversity

FAO advocates for “climate-smart” agriculture which sustainably increases productivity, resilience (adaptation), reduces/removes GHGs (mitigation), and enhances achievement of national food security and development goals.

4. Technologies, practices and processes for adaptation

FAO supports the development and dissemination of improved technologies, practices and processes related to agriculture, forestry, fisheries to increase resilience of the production systems and improve livelihoods.

5. Disaster risk management

FAO supports the strengthening capacities on disaster risk management, improved local practices for risk reduction and enhanced emergency response and rehabilitation interventions.

SUSTAINABLE AGRICULTURE PRODUCTION PRACTICES & TECHNOLOGIES



Traditional farming systems - low input shifting agriculture systems, agro forestry base, mixed cropping, extended fallow periods, and natural rain fed irrigation.



Modern conventional farming systems - high-input production systems, monocropping, intensive land cultivation, increasing use of agrochemicals. Eg squash in Tonga, sugar cane, papaya, taro, ginger, and taro in Fiji.

Traditional farming systems

- In the Pacific effective climate-smart practices already exist, such as the many forms of agroforestry, multi cropping, minimal use of agrochemical, with inclusion of high levels of cultivar biodiversity - already provide a basis to address potential climate change impacts.
- To help countries in the region build more climate resilient agriculture systems FAO has developed a *Food Security Toolkit, designed specifically for Pacific Island Countries which provides recommendations on adaptation steps that are designed to promote crop diversification and maintain ecosystem services, whilst minimizing adverse environmental impacts.*

Sustainable Crop Production Technologies



Improved sustainable farming practices that have been developed and successful in Pacific and Asian developing countries;

- improved farm practices and management
- irrigated cropping systems
- higher yielding, drought and disease tolerance varieties



- integrated pest management,
- conservation agriculture
- organic agriculture
- agro-forestry system
- integrated crops & livestock
- aquaponic production system management

Need more country specific adaptative research!!



4. Technologies, practices and processes for adaptation

- **FAO supports SPC CePACT production and distribution of improve genetic resources & varieties that can withstand conditions such as drought, salinity and water-logged soils.**
- **FAO Rice Crop Management project for Solomon Is include imports of salt tolerance rice varieties for coastal low lying areas.**





Aquaponic production system

- provides fresh fish and organic produce by efficiently recycling nutrient-rich water through a closed-loop system.
- more sustainable it only uses a fraction of the water required for conventional gardening and farming; no fertilizer and chemicals, it is a drought-resistant system.

FAO plans to assist set up demonstrations in Tuvalu, Kiribati, & Samoa.



Monitoring and evaluation of progress toward reducing the vulnerability of "agriculture and food security sector.

- **Inadequate data**
-



PIF Formulation for GEF 5



(a) For Solomon Islands - address threats to biodiversity, land degradation and climate change stemming from unsustainable forest and land-use practices.

(b) For Vanuatu - address threats to biodiversity, land degradation and climate change stemming from unsustainable forest, land-use, and agriculture practices.



PIF Formulation for GEF 5

(c) For Tonga – address threats to biodiversity, land degradation and climate change stemming from unsustainable small holder agriculture and livestock practices.

(d) For Kiribati - Further consultation with the government authorities concerned and finalization of PIF on Integrated Coastal Fisheries Management Framework in Kiribati

FAO South West Pacific Ministerial Meeting in 2011 endorsed the following recommendations

- Improve or strengthen legal and regulatory frameworks for land use management, effective biosecurity and trade facilitation, and regulate the use and distribution of pesticides.**
- Increase farmers and stakeholders' knowledge of the probable impacts of climate change on agricultural production and food security, and develop adaptative measures to reduce vulnerability of agricultural production systems to the impact of climate change.**
- FAO and other development agencies continue to support member countries to achieve sustainable agriculture production and enhanced food security.**²⁹

FAO Strategies in the PICs

Focus of FAO Programme

- ❑ Policy and planning;
- ❑ Food safety, quality and nutrition;
- ❑ Aquaculture and fisheries development;
- ❑ Agriculture (including livestock and forestry) production and productivity;
- ❑ Agribusiness, marketing and trade;
- ❑ Sustainable management of terrestrial, freshwater and marine resources (which is a cross cutting area and includes disaster preparedness and climate change mitigation and adaptation).

Country Programming Framework (CPF)

* All FAO work is linked to the country priorities



Thank you for your attention!!