Module 2: Mainstreaming adaptation into development

2.1. Implications of climate change to development

LEG training workshops for 2012-2013

- Pacific LDCs workshop

In this module

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CASE STUDIES + REGIONAL INPUTS

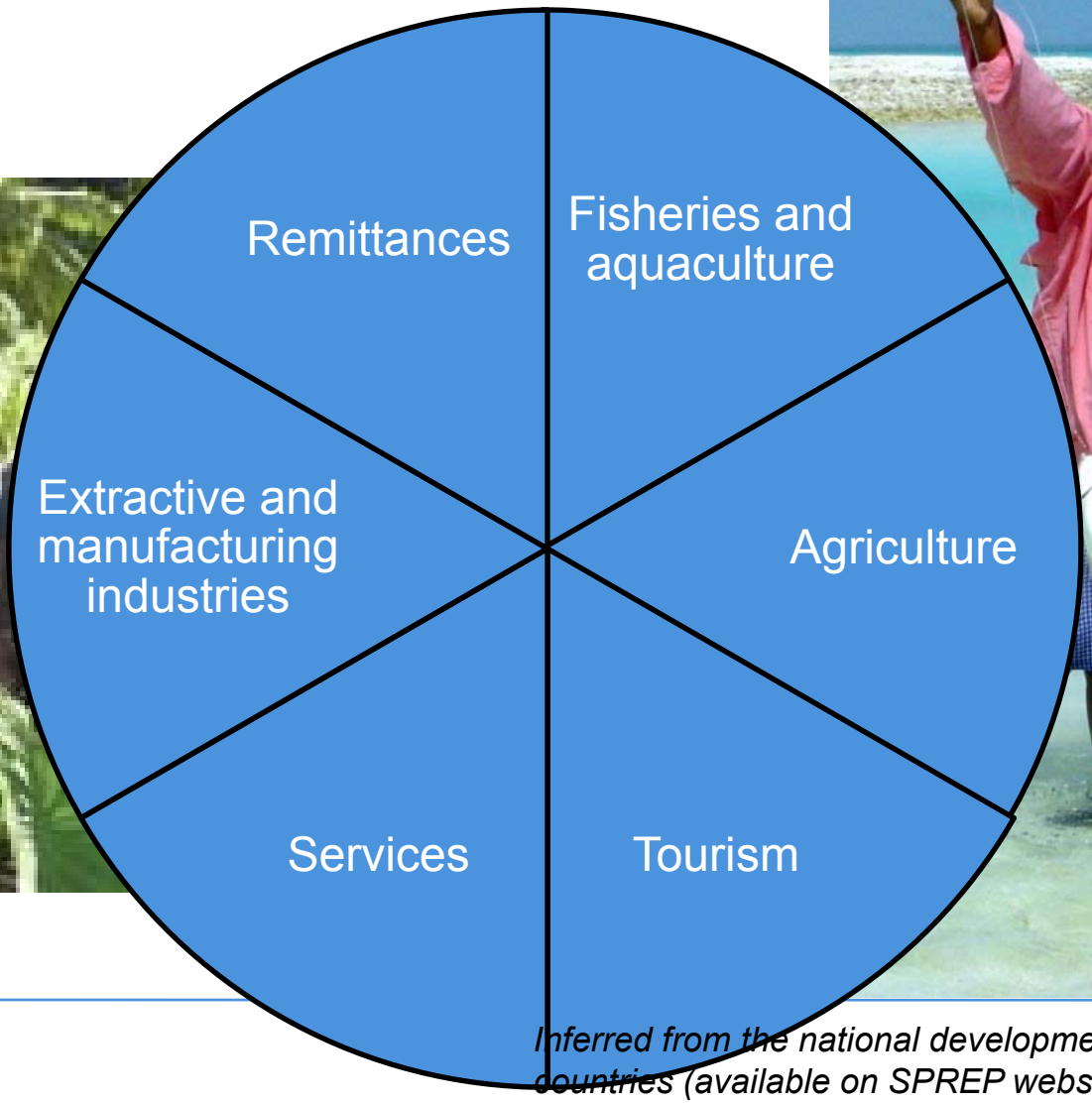
Learning points:

- Projected changes in the climate for the Pacific region;
- How current and future climate change impacts on development;

Guiding questions:

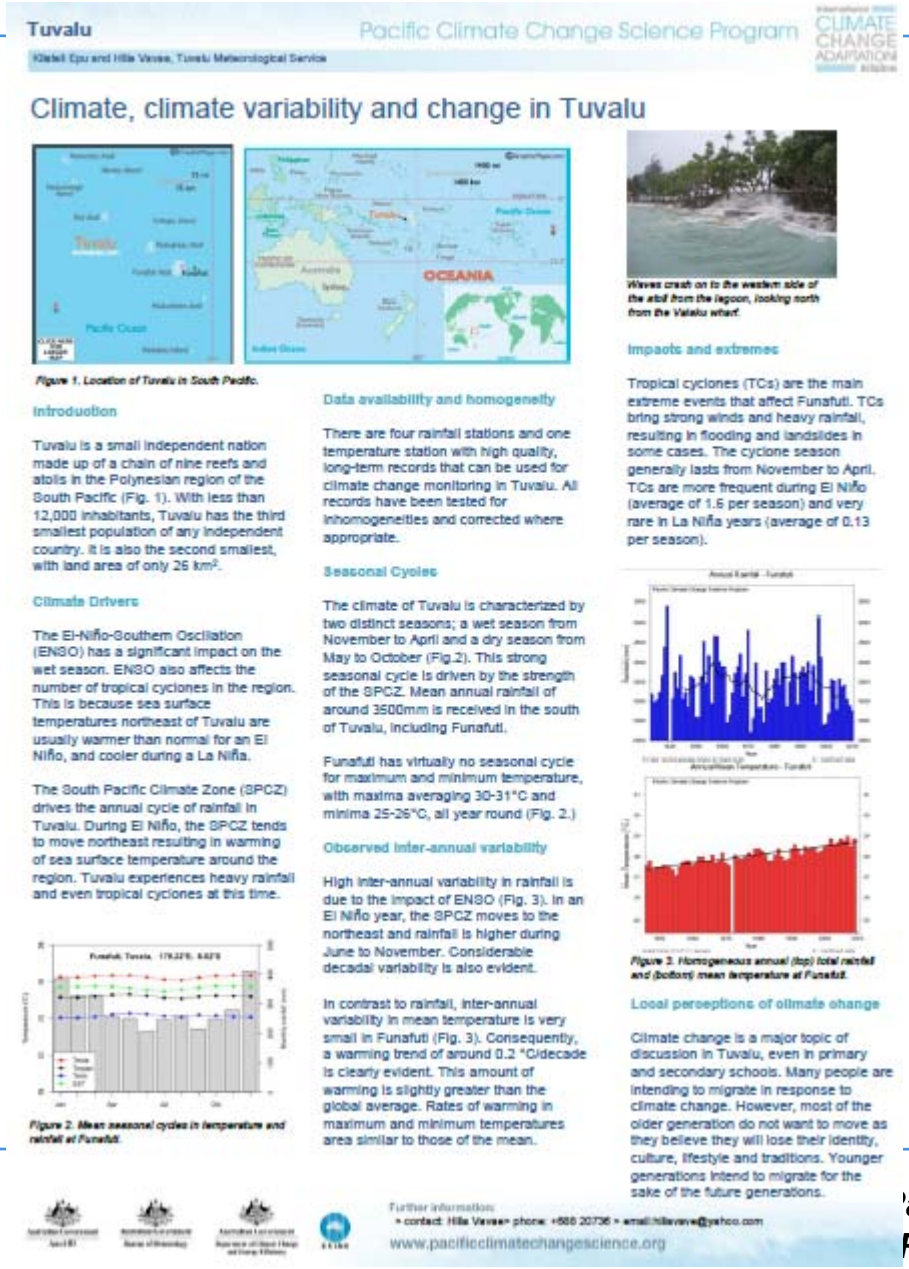
- Which areas of development are most at risk to climate change?
- What will be the nature and magnitude of the impacts?

Key sectors of economic development in the Pacific LDCs



Inferred from the national development strategies of the countries (available on SPREP website) and NAPAs

What do climate projections indicate for the Pacific



Tuvalu

Pacific Climate Change Science Program

Climate, climate variability and change in Tuvalu

Figure 1. Location of Tuvalu in South Pacific.

Introduction

Tuvalu is a small independent nation made up of a chain of nine reefs and atolls in the Polynesian region of the South Pacific (Fig. 1). With less than 12,000 inhabitants, Tuvalu has the third smallest population of any independent country. It is also the second smallest, with land area of only 26 km².

Climate Drivers

The El-Niño-Southern Oscillation (ENSO) has a significant impact on the wet season. ENSO also affects the number of tropical cyclones in the region. This is because sea surface temperatures northeast of Tuvalu are usually warmer than normal for an El Niño, and cooler during a La Niña.

The South Pacific Climate Zone (SPCZ) drives the annual cycle of rainfall in Tuvalu. During El Niño, the SPCZ tends to move northeast resulting in warming of sea surface temperature around the region. Tuvalu experiences heavy rainfall and even tropical cyclones at this time.

Figure 2. Mean seasonal cycles in temperature and rainfall at Funafuti.

Data availability and homogeneity

There are four rainfall stations and one temperature station with high quality, long-term records that can be used for climate change monitoring in Tuvalu. All records have been tested for inhomogeneities and corrected where appropriate.

Seasonal Cycles

The climate of Tuvalu is characterized by two distinct seasons; a wet season from November to April and a dry season from May to October (Fig.2). This strong seasonal cycle is driven by the strength of the SPCZ. Mean annual rainfall of around 3500mm is received in the south of Tuvalu, including Funafuti.

Funafuti has virtually no seasonal cycle for maximum and minimum temperature, with maxima averaging 30-31°C and minima 25-26°C, all year round (Fig. 2.)

Observed inter-annual variability

High inter-annual variability in rainfall is due to the impact of ENSO (Fig. 3). In an El Niño year, the SPCZ moves to the northeast and rainfall is higher during June to November. Considerable decadal variability is also evident.

In contrast to rainfall, inter-annual variability in mean temperature is very small in Funafuti (Fig. 3). Consequently, a warming trend of around 0.2 °C/decade is clearly evident. This amount of warming is slightly greater than the global average. Rates of warming in maximum and minimum temperatures area similar to those of the mean.

Waves crash on to the western side of the atoll from the lagoon, looking north from the Vaiaku wharf.

Impacts and extremes

Tropical cyclones (TCs) are the main extreme events that affect Funafuti. TCs bring strong winds and heavy rainfall, resulting in flooding and landslides in some cases. The cyclone season generally lasts from November to April. TCs are more frequent during El Niño (average of 1.6 per season) and very rare in La Niña years (average of 0.13 per season).

Figure 3. Homogeneous annual (top) total rainfall and (bottom) mean temperature at Funafuti.

Local perceptions of climate change

Climate change is a major topic of discussion in Tuvalu, even in primary and secondary schools. Many people are intending to migrate in response to climate change. However, most of the older generation do not want to move as they believe they will lose their identity, culture, lifestyle and traditions. Younger generations intend to migrate for the sake of the future generations.

Further information

www.pacificclimatechangescience.org

acific: Scientific Assessment

Regional Overview

What do climate projections indicate for the Pacific

1. Temperature increase

- 0.5–1.0C, regardless of the emissions scenario by 2030;
- 1.0–1.5° C by 2055;
- 1.5–2.0° C to 2.5–3.0° C by 2090;
- Increased incidences of heat waves, extremely hot days, warm nights
- 70% as large as the global average warming for all scenarios:

2. Rainfall

- Increase in annual mean rainfall near the SPCZ and the ITCZ;
- Widespread increase in the number of heavy rain days (20–50 mm);
- Increase in incidences of extreme rainfall events;
- Droughts to occur less often in some countries.

3. Sea level rise

- Total sea-level rise that is slightly larger than the global average;
- Sea-level rise greater than 2 m by 2100 is physically untenable;
- More plausible estimate is about **80 cm** by 2100, consistent with IPCC upper end estimates

Source: Climate Change in the Pacific: Scientific Assessment and New Research | ***Volume 1: Regional Overview***

:Extreme sea levels may result in inundation of low-lying coastal terrain, erosion of beaches, ecosystem loss, damage or destruction of coastal infrastructure, damage to crops and water supplies, and injury or loss of life


12
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Climate change impacts and vulnerabilities in the Pacific region (cont.)

Flooding and strong winds associated with tropical depressions and cyclones may result in loss of infrastructure and lives. Future projections indicate that these extremes will happen more frequently

Agriculture is mainly rainfed, and increase in seasonal variations in rainfall may result in losses

For fisheries, changes in the coastal ecosystems and the aquatic environment may lead to changes in yields, species distribution, seasonality of production, and to increased variability of catches


ZION
JAC
ZION

Crop and livestock losses

food security

More extreme rainfall

Threats to livelihoods

Damage to infrastructure

Impacts on

e people!!

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CASE STUDIES + ADDITIONAL METRIALS

Learning points:

- Projected changes in the climate for the Pacific region;
- How current and future climate change impacts on development;

Guiding questions:

- **Which areas of development are most at risk to climate change?**
- **What will be the nature and magnitude of the impacts?**

Impacts of climate change on development in the Pacific

Please provide key examples of the impacts of climate change on development in your country;

If possible by sectors or threats;

Consolidate and provide a summarized list;

Participants to keep these for their practical

Module 2: Mainstreaming adaptation into development

2.2. Adaptation in the development context

LEG training workshops for 2012-2013

- Pacific LDCs workshop

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CASE STUDIES + REGIONAL INPUTS

Learning points:

- Definitions of adaptation and development;
- How adaptation and development coincide;
- How is adaptation different from development

Guiding questions:

- How can the implementation of adaptation be coordinated with development at the national level?

Definitions

Development:

> "The pursuit or attainment of well-being in all its dimensions, including economic sufficiency, social equity, personal security, good health, opportunity, and personal freedom." (Heather McGray et al, 2007);

Sustainable development:

> "Development that meets the cultural, social, political and economic needs of the present generation without compromising the ability of future generations to meet their own needs." (IPCC 2007).

Adaptation:

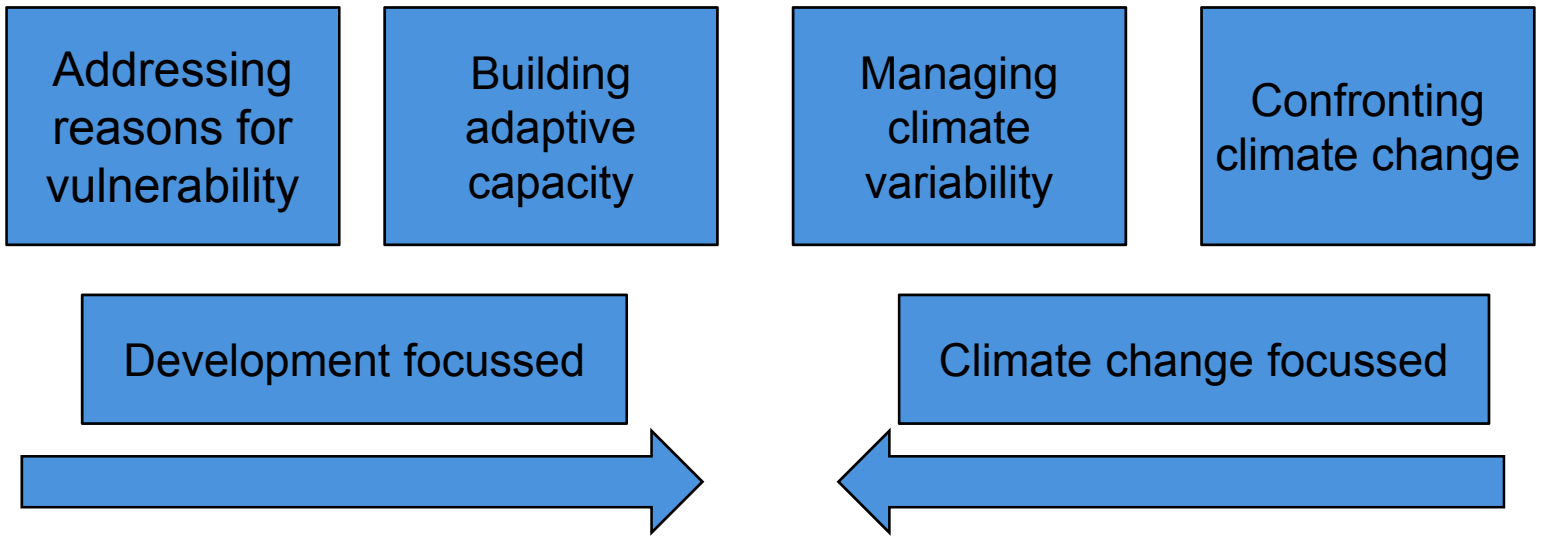
> "**Adjustment** in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" (IPCC, 2007);

Definitions

Adaptation:

"Adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities" (IPCC, 2007);

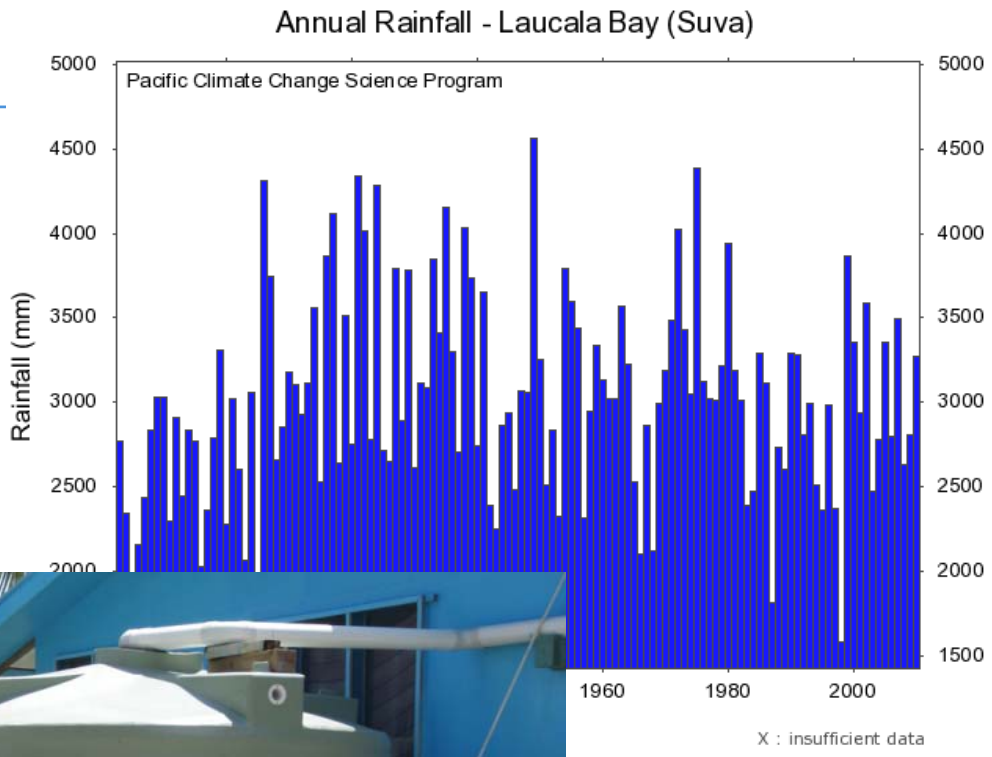
Adaptation Continuum



Addressing reasons for vulnerability

Building adaptive capacity

Managing climate variability



Confronting climate change

Putting adaptation into the development context

Adaptation and development are intricately linked:

a) In most practical cases, adaptation to climate change is naturally embedded in a development fabric, since all countries are addressing management of the main social, environmental and economic systems in one way or another towards sustainable development;

Tuvalu Te Kakeega

- Improve housing standards and availability
- Increase production and consumption of local produce
- Upgrade and maintain transportation services

What are the climate-related risks to the achievement of these development goals?

Putting adaptation into the development context

Adaptation and development are intricately linked:

a) However, social, environmental and economic issues are often addressed separately, mainly as a result of separate sources of funding for the development of adaptation plans/strategies, and for the implementation of identified adaptation activities;

b) Focusing on the beneficiaries of the adaptation or development, it becomes clear that implementation of adaptation activities should be closely coordinated and integrated with development efforts.

Source: McGray, H., Hammill, A. and Bradley, R., 2007, 'Weathering the Storm: Options for Framing Adaptation and Development', World Resources Institute, Washington, D.C.

How can the implementation of adaptation be coordinated with development at the national level?

Module 2: Mainstreaming adaptation into development

2.3. Understanding national development processes, frameworks and models

LEG training workshops for 2012-2013

- Pacific LDCs workshop

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CASE STUDIES + REGIONAL INPUTS

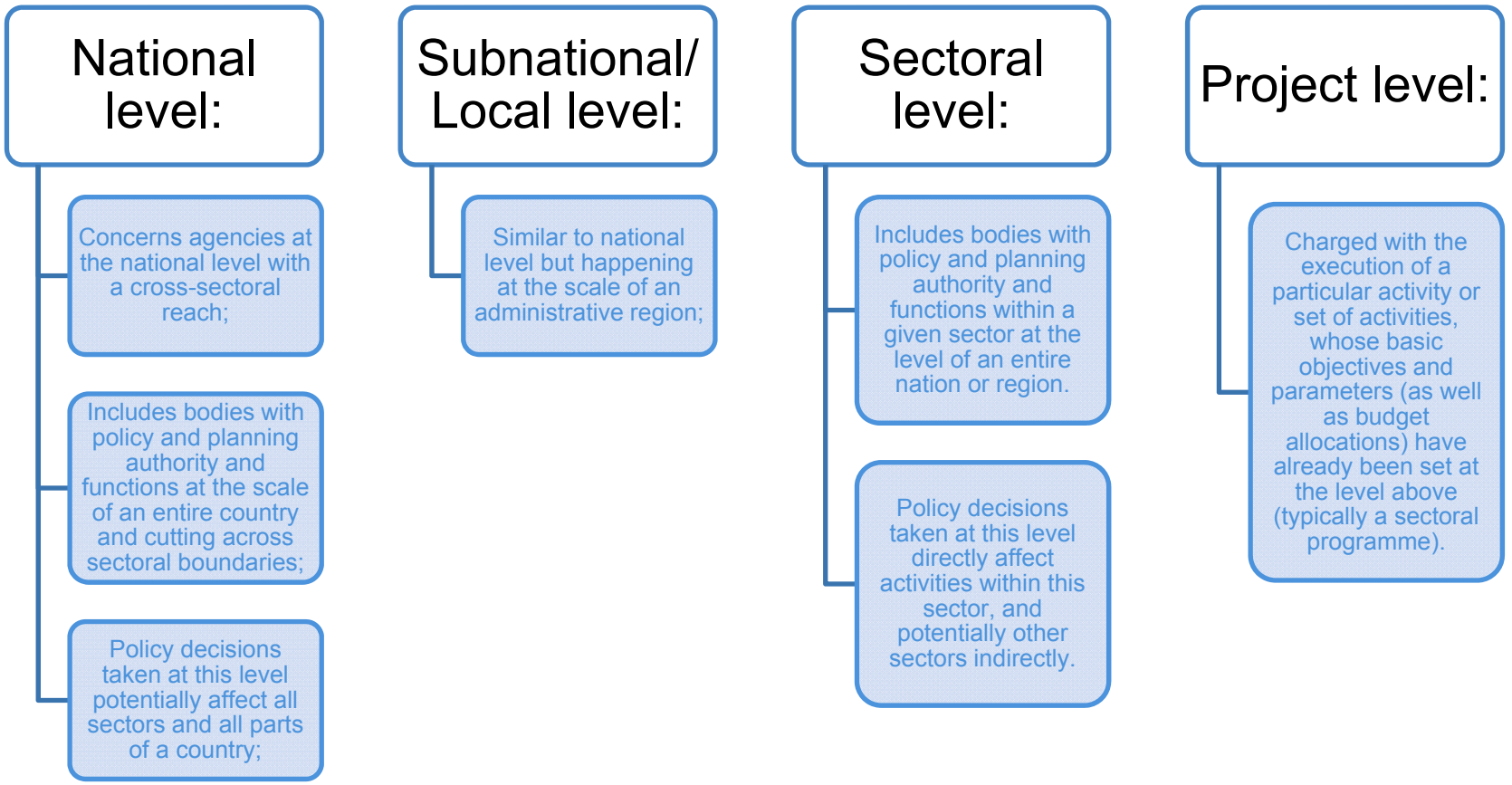
Learning points:

- Decision making in development;
- Understanding national development frameworks.

Guiding questions:

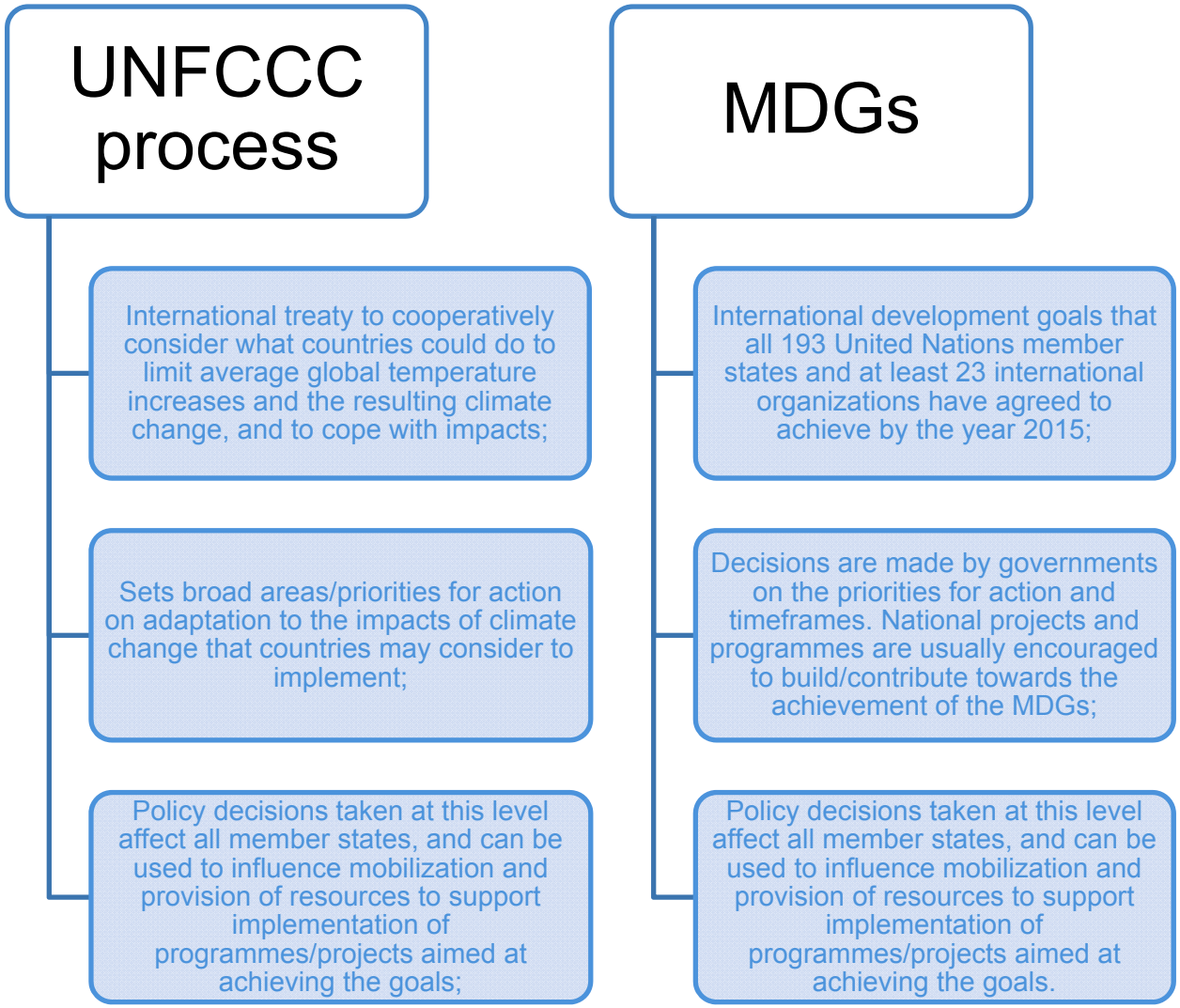
- What are the components of regular development planning that can be used in the adaptation planning process?
- What would be the entry points?

Understanding decision making levels in development planning

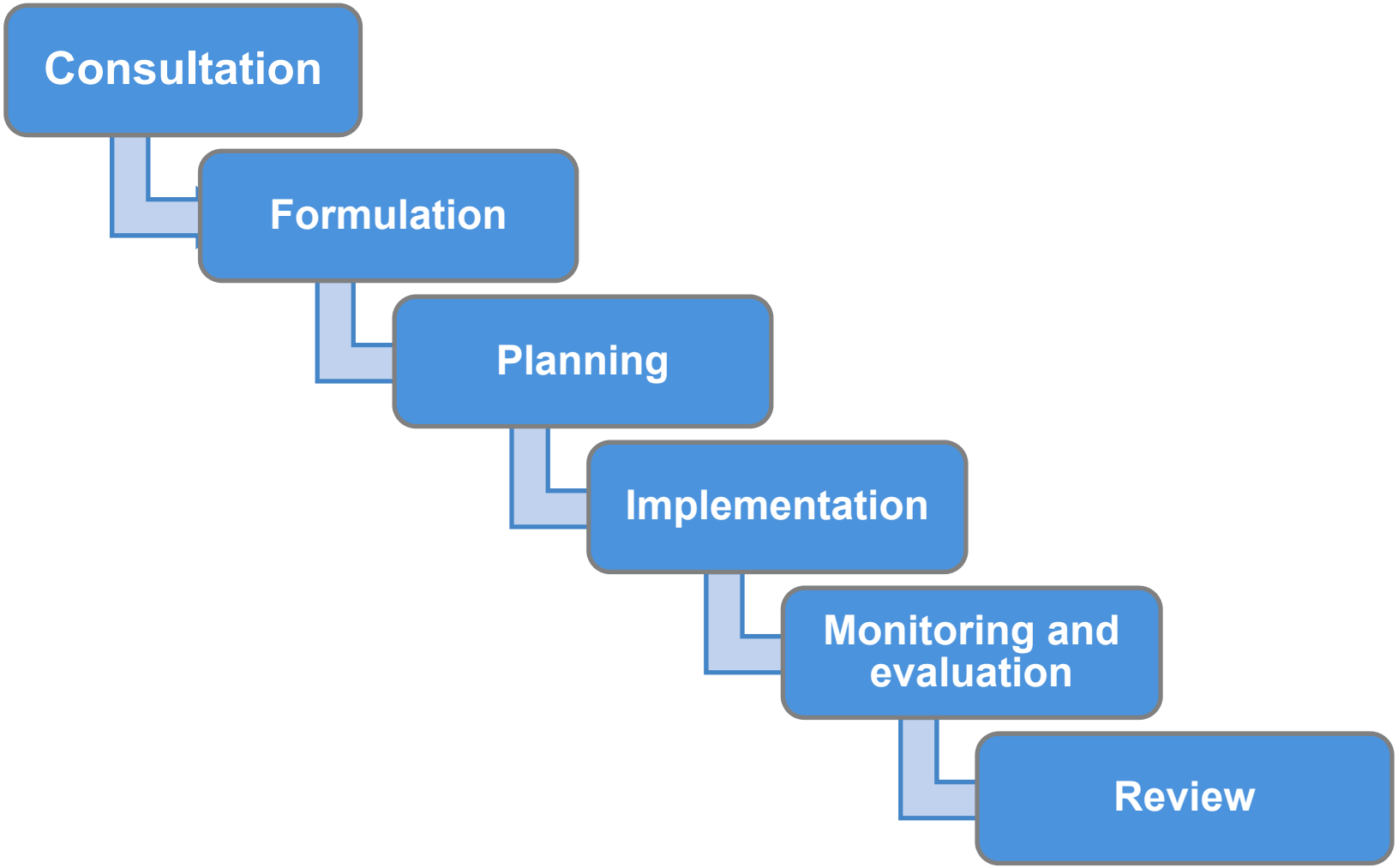


Source: OECD, 2009. Integrating Climate Change Adaptation into Development Co-operation. Policy Guidance. OECD, Paris.

Understanding decision making levels in development planning (cont.)



National policy cycle



Elements of national planning models

Economy	Income and consumption patterns;
	Capital and investments flows;
Society	Population, Gender;
	Education, health;
	Income distribution;
	Labour force and productivity;
Environment	Natural resource stocks - depletion, conservation;
	Pollution generation.

Basic criteria followed by national development models

Public ownership:

- Detail country's national development indicators.
- Demonstrate sharing of income between different income classes.
- Transparency - clarity and explicitness on the basis and assumptions;

Stakeholder involvement:

- Promote participation of the public and civil society, including special groups;
- Promote coordinated participation of development partners;

Long-term vision:

- Long-term vision to guide overall national development;
- Continuity;

Balance between structural/social and macroeconomic/financial concerns

- Representation of social, economic and environmental dimensions;
- Policy making guidance for cross-sector linkages.

Timeframes of national policy plans/frameworks

Longterm plans/frameworks:

- National vision;
- Longterm development plans;

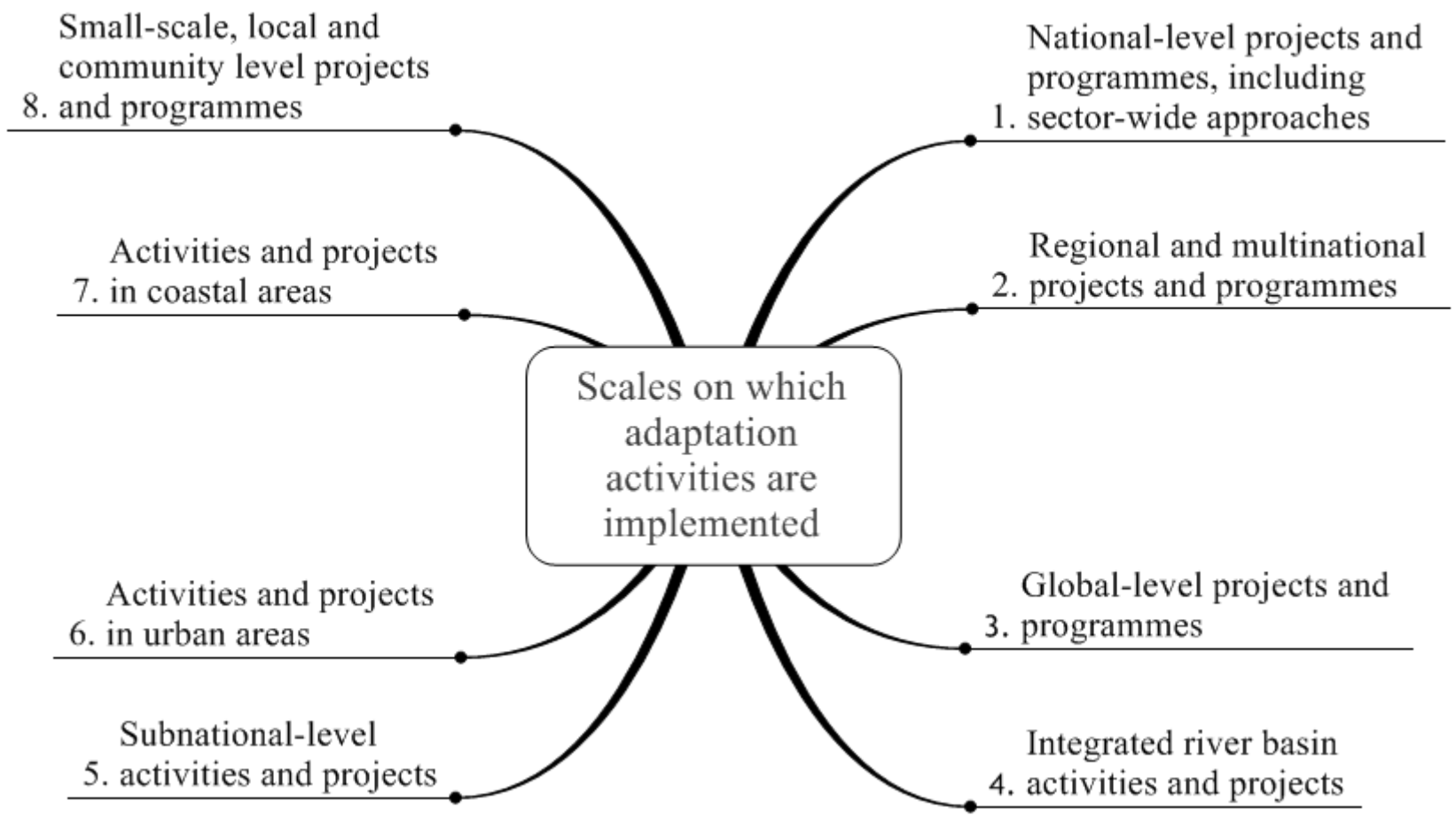
Medium term plans/frameworks:

- Millennium development goals;

Short term plans/frameworks:

- Five year national economic/development plans;

Matching scales at which adaptation activities are implemented



Discussion

What are the components of regular development planning that can be used in the adaptation planning process?

What would be the entry points?

Module 2: Mainstreaming adaptation into development

2.4. Integrating adaptation into development at multiple levels

LEG training workshops for 2012-2013

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CASE STUDIES + REGIONAL INPUTS

Learning points:

- Steps in integrating adaptation into national policies, plans and programmes;
- Screening policies, plans and programmes for climate change;
- Identifying entry points.

Guiding questions:

- What are the key areas/functions of development into which integrating adaptation would most be important?

Steps for integrating adaptation into development planning

1. Understanding how the current climate is relevant to policies, plans or programmes at the national, sectoral, regional or agency level, and how such policies, plans or programmes are sensitive to current climate;
2. Using readily available resources to assess social, economic and environmental impacts of climate change;
3. Identifying and assessing the likelihood and consequences of specific climate-related risks;
4. Identifying opportunities to address climate-related risk within existing management practices, or by adjusting affected policies and programmes;
5. Implementing specific measures to integrate adaptation into the policies, plans or programmes;
6. Identifying and managing challenges and opportunities.

Identifying national development policies, plans and programmes

- National vision (e.g. vision 2020);
- National development and economic growth strategies or plans;
- Medium- and long-term national development goals (such as millennium development goals);
- National policies, strategies and plans on key vulnerable sectors (such as agriculture, water, coastal zones, or health) and on cross-cutting issues such as climate change, including sector-wide approaches;
- National poverty reduction strategies papers (PRSPs);
- National policies on governance and community councils;
- Other policies relevant to data and information collection and management, disaster preparedness and risk reduction;
- Multilateral agencies' strategies and action plans (World Bank Country Assistance Strategy, UNDAF, etc);
- Bilateral cooperation activities and strategies.

Integrating adaptation at various stages of the national policy cycle

Policy formulation stage

- Clear recognition of climate risks and the need for adaptation within relevant policies;
- Applying a climate lens in the formulation of the policy and strategy;

Planning stage

- Applying a climate lens to proposed sectoral plans;
- Proactive action on programmes or projects specifically aimed at enabling adaptation to climate change;

Resource allocation

- Reallocating funding to more vulnerable sectors or regions;
- Funding for adaptation specific plans or activities;

Implementation

- Translation of national-level priorities and budgetary allocations into sectoral and local government-level plans and budgets.

Source: OECD, 2009. Integrating Climate Change Adaptation into Development Co-operation. Policy Guidance. OECD, Paris.

Identifying and engaging key stakeholders

- Stakeholders would differ depending on the scale and the type of the adaptation activities – i.e. based on key threats etc…;
- Establish partnerships with relevant government agencies and other stakeholders (community organizations, NGOs, advocacy groups, etc);
- Identify and engage the Ministry, agency or organization under which the majority of overall responsibility and coordination of the respective activity lies;

Examples of stakeholders at different levels of planning

National level

- National government – Parliament, President/Prime Minister's office
- Government ministries and departments
- Specialized Government Agencies and Committees
- Academic and research institutions
- Civil society organisations, associations and NGOs operating at national level
- International organizations operating at national level
- Donor agencies

Local/regional level

- Local governments
- Local communities (e.g. disaster risk reduction/management community)
- Civil society organizations and NGOs operating at local level
- Businesses
- Households
- Opinion leaders
- Educators

Sectoral level

- Government ministries or departments relevant to the sector being addressed
- Private sector
- Civil society organizations, associations and NGOs with interest on the sector

Project level

- Project implementation team
- Experts relevant to the project (project managers, economists, livelihood specialists)
- Specific communities or regions which are vulnerable
- Households
- Opinion leaders
- Educators

Enabling frameworks for integrating adaptation into development

- Climate change law/act;
- Environment law/act;
- Regulations governing coordination of institutions;
- Laws on sustainable use or protection of natural resources;

Points for trainees

What are the key areas/functions of development into which integrating adaptation would most be important?

Working from the national development plan from respective country:

- Select one key sector/region that you find most important for economic development, and yet potentially sensitive to climate change;
- Use the points elaborated on slide 3 to assess the threats posed by climate change, and integrate climate change adaptation into the respective actions planned under the sector;

Module 2: Mainstreaming adaptation into development

2.5. Examples of adaptation activities

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CASE STUDIES + REGIONAL INPUTS

Learning points:

- Insight in adaptation activities developed by the LEG based on the projects identified in the NAPAs.

Guiding questions:

- What type of adaptation activities would contribute towards achieving each goal?
- How are the adaptation activities linked to regular development goals?

Agriculture and food security, including fisheries

Goal

To achieve and safeguard food security.

Example adaptation activities include:

- Change of planting dates;
- Diversification of crop production by breeding resilient crops (drought resilient for drought, salt resistant for coastal zones, etc.);
- Subsidies for fertilisers, seeds and/or guaranteed prices for farmers;
- Fodder production, reseeding of rangelands;
- Water saving irrigation techniques;
- Land use planning, soil conservation;
- Improvement of methods for food processing and preservation;
- Use of food/cereal banks;
- Diversification of sources of fish for canneries;
- Introducing fish concentration mechanisms;

Water resources

Goal

To achieve and safeguard water security and sanitation.

Example adaptation activities include:

- Rain water harvesting;
- Rehabilitation of wetlands;
- Integrated watershed management with land use and coastal areas protection benefits;
- Rehabilitation of boreholes/wells;
- Resilient designs of reservoirs, irrigation canals, ponds and dykes;
- Water use efficiency;
- Eco-sanitation.

Early warning and disaster management – physical safety

Goal

Protection of life and property against climate extremes and disasters including along low lying and coastal areas.

Example adaptation activities include:

- Artificial lowering of lakes;
- Construction of dykes, current breakers, and shifting dune bars;
- Radar reflectors and live vests for fishermen;
- Hazard/risk maps and related response maps, escape routes;
- Planning settlements in low risk areas;
- Resettlement of communities at risk;
- Rehabilitation of existing and/or install new observing systems;
- Establishment of communication systems for early warning.

Terrestrial and coastal ecosystems

Goal

Protection and enhancement of ecosystem structure and function for the sustainable provision of ecosystem goods and services.

Example adaptation activities include:

- Coastal afforestation, rehabilitation and management;
- Participative protection of coastal sediment barriers;
- Optimization of freshwater and drainage management;
- Soil and vegetation management;
- Integrated watershed management;
- Reseeding of rangelands;
- Plantation of trees and grasses in gullies;
- Construction of gabions to stop erosion and rehabilitate wetlands;
- Rehabilitation of silted ponds and reconstitution of basin slopes.

Health

Goal

Support and enhancement of human health and safety.

Example adaptation activities include:

- Distribution of treated mosquito nets;
- Production of bio-pesticides;
- Rehabilitation and establishment of health care centres;
- Securing potable water;
- Waste water treatment systems.

Energy

Goal

Protection and expansion of renewable energy sources and supplies.

Example adaptation activities include:

- Wild fire prevention and management;
- Deploying energy efficiency;
- Investing in micro hydropower generation stations;
- Diversification of energy sources (solar, wind, biogas).

Social and economic development

Goal

Climate proofing major components of national economies and sustainable development (socio-economic growth engine).

Example adaptation activities include:

- Community training programmes on climate change;
- Inclusion of climate change into national curriculum;
- Creation and utilization of insurance systems for climate change;
- Allocation of contingency funding in droughts;
- Allocation of contingency funding for surviving during disasters;
- Safety nets (e.g. social action funds)
- Gender mainstreaming;
- Vocational training facilities and centres for communities.

Culture

Goal

Protection and preservation of cultural values and systems.

Example adaptation activities include:

- Protection and conservations of indigenous species;
- Preservation of cultural heritage sites and promotion of botanical gardens.

Discussion

What type of adaptation activities would contribute towards achieving each goal?

How are the goals linked to regular development goals?