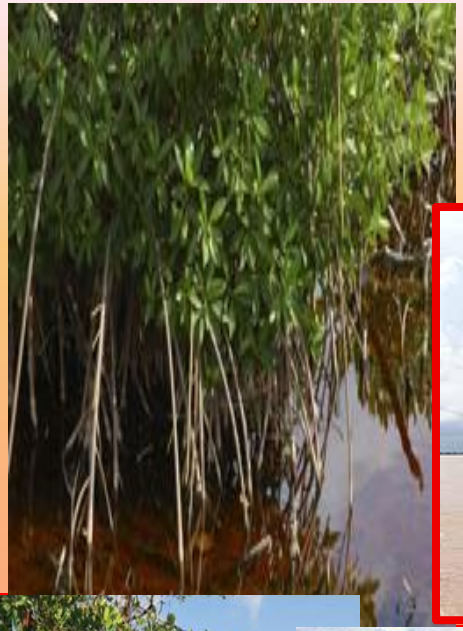
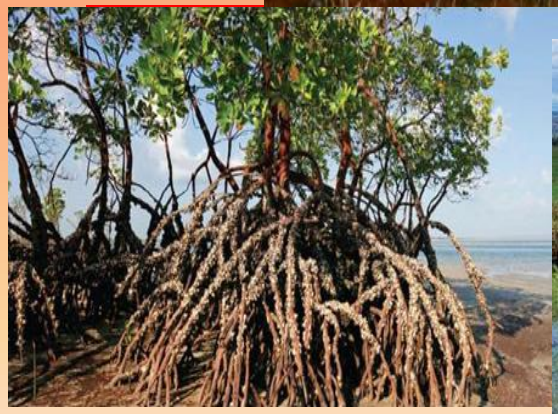
Integrating Climate Resilience into Agriculture and Natural Resources Management

Experience from the Philippines and Samoa





Samuel Wedderburn, The World Bank, April 2011

Outline

- Introduction
- Philippines: country context
- Climate Change Adaptation Project
- Climate Resilient Agriculture
- Increasing Resilience in ecosystem management
- Samoa country context
- Managing hazards and risks
- Coastal Community Resource Management
- Ecosystem based adaptation
- Final thoughts

Introduction: Climate Risks in Agriculture and Natural Resources Management

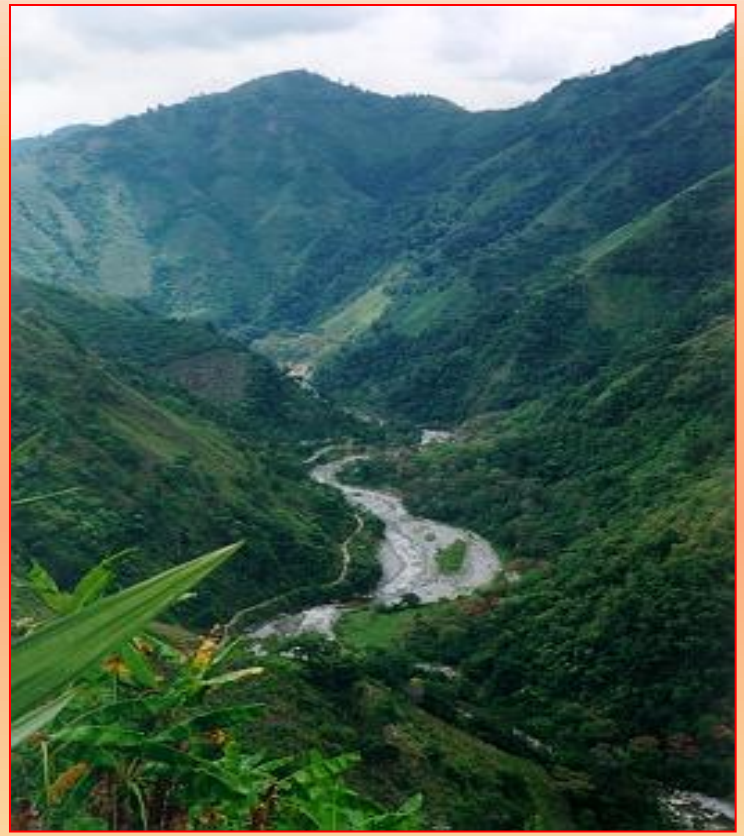
- Economic importance;
  - Agriculture contributes 15% to GDP in Philippines and 11% in Samoa
  - Employs 34% of labor force in Philippines and 65% Samoa respectively
  - Economies depend on natural assets - major source of livelihoods and dependence by poor
- Risks and Vulnerabilities:
  - Agriculture is the most vulnerable sector
  - Possibility for major disruption
  - Ecosystems including forests, coastal and marine systems highly vulnerable - externalities for agriculture and water resources

Philippines Country Context

- Among highest exposure to natural hazards: typhoons, floods, landslides, droughts, volcanoes, earthquakes, tsunamis
- 2 typhoons in 2009 killed 600 people, disrupted the lives of 7M and caused US$.75 bn in damage
- Not counting the above, since 1900, natural hazards cost 50,000 lives and US$7 Bn in property damage
- Expected climate impacts: sea level rise, more intense rainfall events, longer dry spells, stronger monsoon rainfall
- Agriculture most vulnerable – El nino events caused largest drop in GDP in the past decades
- Poor communities most vulnerable

Philippines Climate Change Adaptation Project

- Objectives: Develop and demonstrate approaches that would enable targeted communities to adapt to the potential impacts of climate change.
- Components:
  - Strengthening the enabling environment
  - Demonstration of CCA strategies
  - Enhanced provision of scientific information for data for climate risk management
- Finance: $5 M GEF-Special Climate Change Fund
- Approved June 2010
- Targets mainstreaming CCA in 2 Bank supported operations and other key activities in agriculture and natural resources management

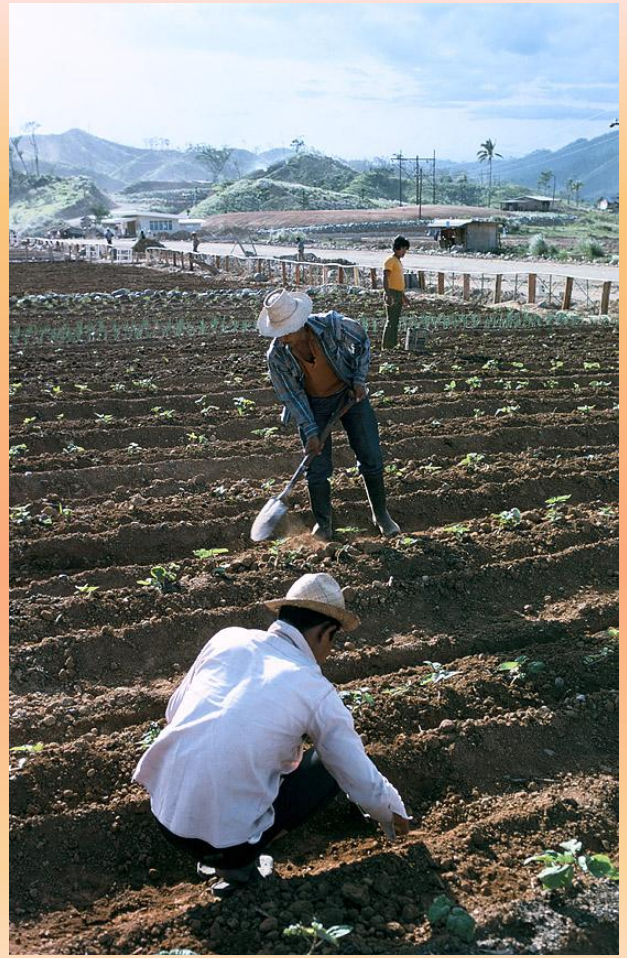


Climate resilient irrigation infrastructure

- Irrigation infrastructure developed under the existing Participatory Irrigation Development Project (PIDP) with no regard to climate risks
- Adaptation project is piloting climate risk assessment and development of parameters for redesign, retrofitting or operational modification
- Combining downscaled climate data with use of historical rainfall data, hydrology and economic analysis.
- Also bottom up approach through Vulnerability and Adaptation Assessment with communities.

Climate resilient irrigation infrastructure cont'd

- Recommendations to influence design, O&M, water users assocations, on farm water management
- National Irrigation Authority (NIA) agree to mainstream the approach in other operations
- Also strengthen capacity of the NIA in climate change adaptation
- Linkages with WB project in India



Enhancing Extension Services Through Climate Risk Management

- Advice to farmers does not take account of climate risks
- Adaptation project aimed at enhancing provision of localized climate and weather information services
- Introduce approaches to crop management under increased climate risks

Enhancing Extension Services Through Climate Risk Management cont'd

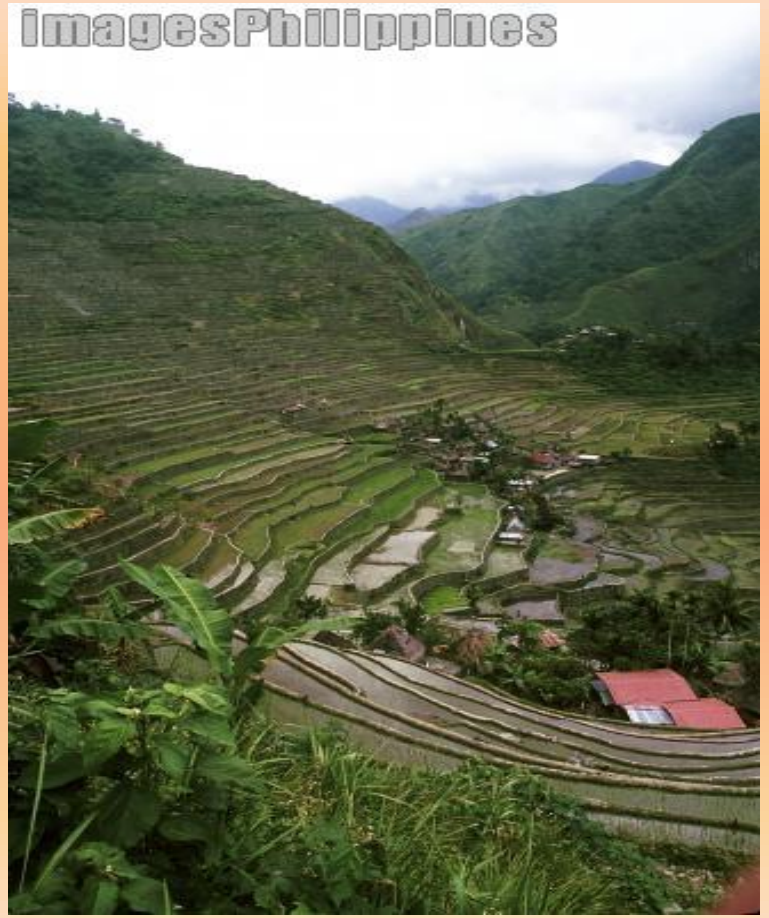
- Strengthening local climate information services:
  - Collection of agro-met data
  - Early warning systems
- Develop decision tools for farmers based on Vulnerability and Adaptation (V&A) assessments:
  - Weather and climate information
  - Soil data from remote sensing
  - Other agro-ecological data

Enhancing Extension Services Through Climate Risk Management cont'd

- Combined research, experimentation and field trials
- Partnerships with UPLB College of Public Affairs and IRRI;
- Training of farmers at climate field schools
- Capacity building of extension workers
- Dissemination with the aid of digital cadastral maps linked to farmers registry

Integrating climate resilience into Natural Resource Management

- Ongoing Bank operation focused on integrated management of watersheds and protected areas nationwide
- Aim of enhancing protection of key ecosystems services with critical impacts on downstream agricultural activities, food security, basic services
- But impacts of climate change not taken into account in design of the project nor in work of the Government agency responsible



Integrating Climate Resilience into Natural Resource Management cont'd

- Present threats could be exacerbated by temperature rise, increased flooding, droughts, etc.
  - deforestation, loss of vegetation, soil loss, diminished biodiversity values, degradation of watersheds, mangroves and coral reefs to be
- Threat to of displacement to some key species
- Possible agriculture expansion into more remote higher-elevation areas as temperatures rise

Integrating Climate Resilience into Natural Resource Management cont'd

- Approach is to update PA management plans by including climate resilience:
  - V&A study to define climate trends and identify recommendations for adaptive measures to include climate change adaptation.
  - Being piloted in two areas
- Should result in recommendations to help resource users transition to more sustainable livelihoods; better conserve biodiverstiy and other ecosystem functions;
- No-regrets approach - includes well known approaches - vulnerability mapping, ridge to reef, etc.
- Results would be upscaled by the national PA Management Bureau

Samoa Country Context

- Located in the Pacific Ring of Fire
- More intense and frequent cyclones
- Extreme rainfall and flooding, high wind and storm surge, landslides and erosion
- Sea level rising
- 4 major weather events in past 20 years cause US$600M + damage - more than 100% of 2005 GDP ($1 Billion today)

Samoa: Coastal Resources Management

High Coastal Vulnerabiltiy

- 70% of the population live on the coast
- Homes, infrastructure, livelihoods concentrated on coast.
- 80% of coastline highly sensitive to erosion, flooding and landslide
- Exacerbated by sand mining, construction in hazard zones, building design
- Poorly planned and executed responses

Hazard Mapping and Vulnerability Assessment

- Samoa Infrastructure Asset Management Project since 2001
- The entire coastline of Samoa was mapped using aerial photographs and detailed field work of surveys and villager interviews.
- Mapped for erosion, flooding and land slip
- Series of community-based management plans based on risk assessments and now cover all 41 Districts: Coastal Infrastructure Management Plans
- Many activities in Plans implemented under various programs

Plan Development Process

- Communities empowered to discuss hazards and risks – participate in collective problem solving.
- Range of solutions from soft greener to hard engineering
- Plan drafted based on environment reporting, hazard mapping and information from consultations
- Plan describes on the ground actions to reduce and mitigate against natural hazard.
- Actions to address problem assigned to government departments and local villagers. Plan signed
- Community and the government in partnership.

Extracts from CIM Plans

Infrastructure	Best and other solutions proposed	Implementation Guidelines
Access roads	Improve culverts and drainage ditches to reduce flooding	Ensure inspection, upgrade and maintenance works programmed in annual budget of Works Ministry
Coastal protection	Plant appropriate tree species and other vegetation along coastline to reduce erosion.	Government provides seedlings, villagers plant. Awareness activities on the role vegetation plays in stabilizing coastal areas
Coastal protection	Establish marine protected area	Government to investigate feasibility of establishing a marine protected area
Wetlands	Initiate village replanting programs for coastal wetlands	Environment Ministry to identify appropriate species and provide seedlings

Ecosystem Based Approach using Community Plans

- Need for stronger ecosystem based approach – greener solutions
- Under PPCR, coastal community plans to be linked to broader catchment plans for whole of catchment approach – ridge to reef
- Coastal plans to be extended to incorporate activities inland in upland areas because they affect what happens on the coast
- Agriculture based adaptation options such as vegetable cultivation for the tourism market possible

Signed CIM Plan

Coastal Infrastructure Management Plan

Falealupo District

Implementation Guidelines

February 2007

Participants in the Plan

The CIM Plan is a Partnership between the Government of Samoa and the villages within the Plan area. Both partners have responsibility for different levels of infrastructure in the local communities and the Plan gives an integrated approach to the provision of services and improvement of resilience now and in the future.

This Plan incorporates the Faipule District of Falealupo.

The Committee for the Faipule District of Falealupo confirms the participation of the Villages in the preparation of this Coastal Infrastructure Management Plan for Falealupo District in partnership with the Government of Samoa and its adoption as a Management Plan for the implementation of the Coastal Infrastructure Management Strategy.

Village Meetings: **Village Representatives:**

Falealupo-uta & tai Villages 12 September, 2005

The CIM Plan Committee representing all of the Villages in the area met on 20 February, 2006
Comments on the draft CIM Plan were received from the Committee during December, 2006

Government Departments and Corporations:

- Ministry of Natural Resources & Environment - Planning and Urban Management Agency
- Ministry of Works Transport and Infrastructure -
- Ministry of Women, Community and Social Development (including Internal Affairs)
- Ministry of Finance
- Samoa Water Authority
- Electric Power Corporation
- Samoa Communications Ltd
- Samoa Land Corporation

The Planning and Urban Management Agency, as lead organization of Government, on behalf of the participating Government Departments and Corporations, confirms the participation of the Government of Samoa in the preparation of this Coastal Infrastructure Management Plan and its adoption as a Management Plan for the implementation of the Coastal Infrastructure Management Strategy.

Signed:

Chief Executive Officer, Ministry of Natural R

The Government of Samoa adopts the Coastal Infrastructure Management Plan for the Faipu
implementation of the Coastal Infrastructure Management Strategy (CIMS).

Signed:

Honourable Minister, Ministry of Natural Resources & Environment

Minister of Natural Resources

Final Thoughts

- Key challenge in the Philippines is limited knowledge and capacity for integrating climate resilience
- Gap between research and experimentation and actual implementation on the ground
- Opportunities for collaboration with FAO and CGIAR
- In Samoa CIM Plans provide good framework for expanding the scope of activities and into the upper catchment
- Based on sound bottom up principles of real community participation and ownership
- Shows importance of communities understanding the risks




In Samoa, we say,
FAAFETAI TELE LAVA!

Thank you!