

Thematic discussion: Agriculture and Food Security

UNFCCC LDC Expert Group

LDC Workshop on National Adaptation Programmes of Action – Dar Es Salaam, October 18-23, 2009



UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

Goals of session

- Introduce issues to consider in designing activities to be included in NAPA implementation projects
- Highlight need to link with state of practice and state of knowledge in relevant sector including existing institutions
- Introduce case study of elaboration of Adaptation Goals and Strategies given in the Step-by-Step Guide

Introducing adaptation

- Considerations in defining adaptation
 - What is system being addressed?
 - What is goal of the system, important characteristics (e.g. services towards socio-economic development, human welfare, etc)
 - How will climate change affect the system or the delivery of systems and how to cope or adjust to this?

Introducing adaptation: projects, adaptation deficit

- What is an adaptation **project**?
 - A project to the LDCF or other adaptation funds or is there more?
- Concept of development baseline/benchmark and “Adaptation Deficit”
 - In many LDCs, many services under what one could call the sustainable development line/benchmark, e.g. climate information and early warning systems not fully in place
 - Systems not fully able to cope with current climate variability – this defines an adaptation deficit
 - So adaptation activities have to overcome this deficit in addition to addressing new threats and risks

Defining Adaptation

- **Adaptation to climate change is defined as human-driven adjustments in ecological, social or economic systems in response to actual or expected climate stimuli and their effects or impacts (NAPA Step-by-Step Guide)**
- Each of these systems has multiple levels and components that cascade multiple temporal and spatial scales, often interacting with each other in complex ways.
- The adjustments and interventions can thus be at any appropriate entry point in these interacting multi-disciplinary and multi-scaled systems.

Adaptive Capacity and form of activities

- Further, adaptive capacity then refers to the potential or ability of a system (social, ecological, economic, or an integrated system such as a region or community) to minimise the effects or impacts of climate change, or to maximise the benefit from positive effects of climate change.
- Adaptation can take the form of activities designed to
 - enhance the adaptive capacity of the respective system
 - actions that modify socio-economic and environmental systems to avoid or minimize the damage caused by to climate change.
 - Methods for achieving these include implementing new activities that are exclusively in response to climate change, or the modification of existing activities to make them more resilient to future climate change risks (climate-proofing).

Adaptation goals

- **Agriculture and Food Security:** Achieve and Safeguard Food Security
- **Water Resources:** achieve and safeguard water security and sanitation
- **Physical Safety:** Protecting Life and Property against climatic extremes and disasters including along low-lying and coastal areas
- **Protecting livelihoods and enhancing adaptive capacity**
- **Climate Proofing** major components of national economies and Sustainable Development [Climate proofing the socio-economic growth engine]
- Supporting and Enhancing **Human Health and Safety**
- Protecting and Enhancing Ecosystem structure and function for Sustainable Provision of **Ecosystem Goods and Services** including Land Use
- Climate Proofing Renewable **Energy Sources and Supplies**
- Protecting and Preserving **Cultural Values and Cultural Systems**
- Protecting and Improving the Design of Critical **Infrastructure and Land Use Planning**

Box AI-4.

Scales at which adaptation activities are implemented

- Small-scale/Local/Community Level
- Activities in Coastal Areas
- Urban Areas
- Sub-national Level Projects & Activities
- Integrated River Basin Management
- National Level Projects & Programmes including Sector-wide approaches
- Regional – Multinational Project Activities & Programmes
- Global Level Activities & Projects



**ADAPTATION
GOAL**

1. Agriculture and Food
Security: Achieve and
Safeguard Food Security

Production

Ag Crop Production Subsystems at Different Scales +

Fisheries +

Livestock Production +

Farming Systems

Mix of production systems +

Food Systems at Multiple Scales:
Household, National to Global Levels

Access to Food +

Food Availability +

Food Utilization +

**ADAPTATION
STRATEGY
METHODOLOGIES
AT DIFFERENT
SCALES**

**Regional and
multinational activities
& programmes**

Agriculture and food security: achieve and safeguard food security

- Create and/or strengthen regional centres for agricultural advisories
- Strengthen regional collaboration and sharing of lessons and best practices
- Create collaborations for regional food trade

- Seasonal forecasting
- Geographic information systems and index maps
- Monitoring extreme events, pests, diseases, migration, etc...

Water resources and water security

- Damming in trans-boundary rivers
- Wetland management
- Resource Rationing/Load Shading
- Integrated River Basin Management

- Trans-boundary allocation
- Resource rationing / load shedding
- Protection of watershed areas

Physical safety: protection of life and property against climate extremes and disasters including along low lying and coastal areas

- Create and/or strengthen regional disaster warning and forecasting centres (tropical storms)
- Develop regional hazard/risk maps and related response and escape measures
- Promote regional data exchange

Supporting and enhancing human health and safety

- Monitoring and early detection of spread of diseases
- Strengthen regional research centres for diseases
- Establish regional assistance and cooperation programmes

Protecting and enhancing livelihoods and adaptive capacity

- Regional collaboration in sharing of lessons learned and best practices
- Promote regional cooperation in vocational training



1. Agriculture and Food Security: Achieve and Safeguard Food Security

Production

- Ag Crop Production Subsystems at Different Scales
- Fisheries
- Livestock Production

Individual Crops

- Improving productivity
- Managing water and moisture
- Crop Breeding

Crop Production at Stand Level

- Choice of species
- Improving yield
- Managing soil fertility
- Managing water and moisture
- Irrigation
- Managing pests and diseases
- Crop Breeding

Cropping System

- Land Use - availability of Land
- Land Suitability
- Mix of species
- Managing the crop calendar e.g. using climate outlooks/EWS
- Insurance against losses

Farming Systems

Mix of production systems

- Land Use - availability of Land
- Land Suitability
- Mix of species and production systems

Food Systems at Multiple Scales: Household, National to Global Levels

Access to Food

- Local Production
- Distribution
- Exchange

- Insurance against losses
- Subsidies
- Crop Breeding R&D
- Macro Irrigation

Food Availability

- Affordability
- Allocation
- Preference

Food Utilization

- Nutritional Value
- Social Value
- Food Safety

DIAGNOSIS OF COMMON ADAPTATION STRATEGIES FOR AGRICULTURAL PRODUCTION

1. Improving and Increasing Water Harvesting

Types

- Rain Water Harvesting
- Surface Water Harvesting
- Ground Water Harvesting
- Traditional Water Harvesting Structures in Low-Rainfall Areas
- Artificial Recharge of Belowground Water

- Roof water harvesting
- In-situ water harvesting
- Augmentation of spring-discharge
- Subtopic
- Sand dams
- Sub-surface barriers
- Aquifer transfer

Issues

- Reduction of evaporation
- Water quality issues

2. Optimizing Choice of (Available) Species

Procedures when introducing new species

- Step 1: Identify new species, genotype +
- Step 2: Acquire seed and conduct provenance trials
- Step 3: Mass produce seed for selected genotype or acquire seed
- Step 4: Adoption of new seed & related extension activities

Issues

- Time from start to full application of new species type can be long
- Key Considerations

- Potential Pests and Diseases
- Technological Requirements
- Risk of contamination of indigenous genotypes
- Risk of introducing invasive species
- Risk of matching to climate conditions that are still changing

3. Improving Site Productivity

**Fertilization
Managing Soil Fertility**

- Ecological constraints to production
- Soil quality replenishment – nutrient retention and recycling

**Managing Water
Managing competition from weeds
Optimizing species choice and genotype
Deal with multiple stress factors**

- Withstanding climate variability – managing availability
- Increased and improved water use

4. Crop Breeding (of New Cultivars)

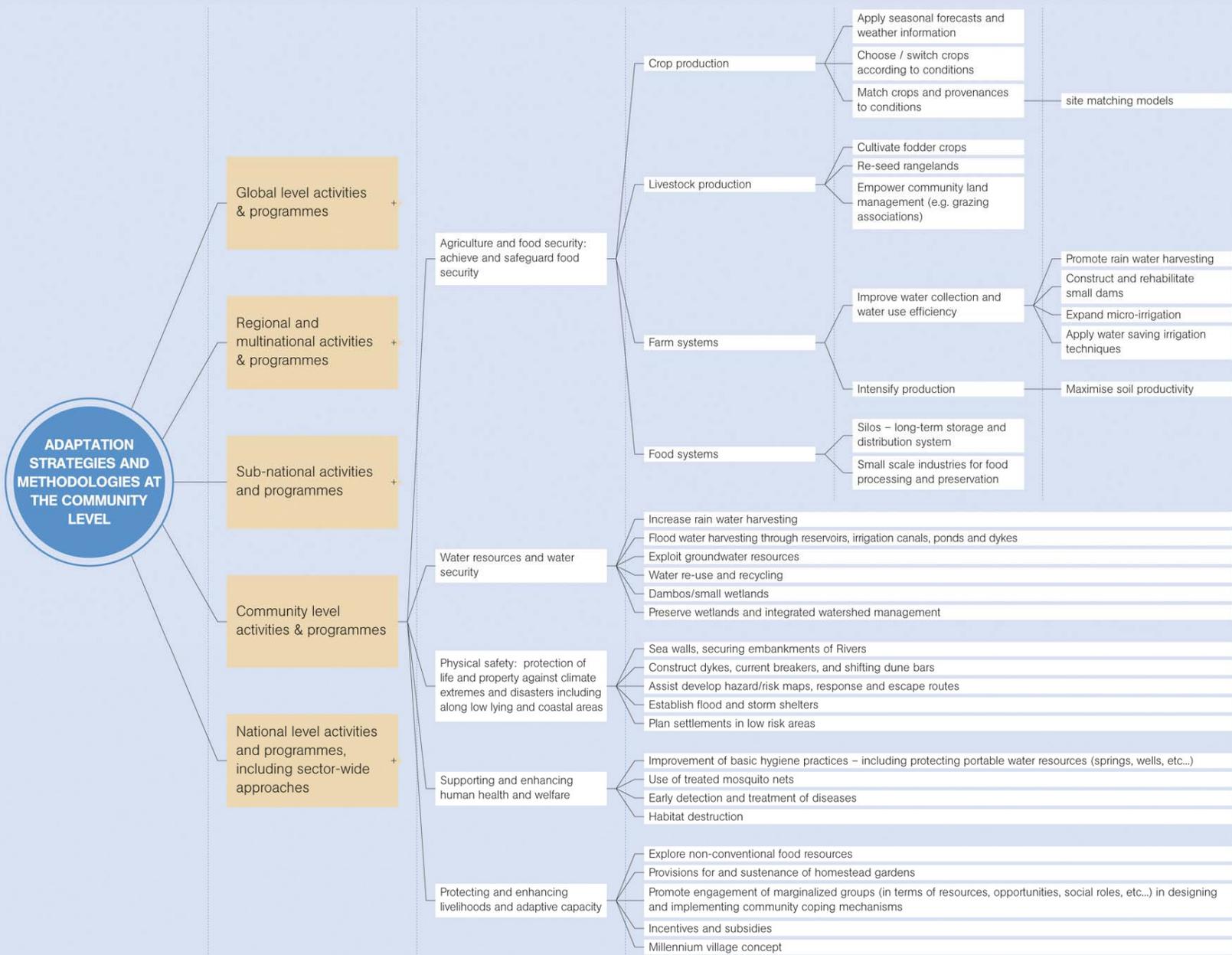
Goal for the breeding programme – what traits to breed for?

- Deep roots
- Drought tolerance
- Shorter growing season
- Salt tolerance
- Frost tolerance
- Flood tolerance

Issues

- High technology needs
- Time – several generations of the crop needed to breed for traits





ADAPTATION STRATEGIES AND METHODOLOGIES AT DIFFERENT SCALES

National level activities and programmes, including sector-wide approaches

Energy – Electricity load shading
Rehabilitate critical watershed areas to secure water flows and reduce siltation

Energy

Provide vocational training centres and facilities at community levels

Design and implement institutional human resource development programmes for empowering communities

Design and implement safety net programmes such as social action funds

Promote engagement of marginalized community groups in livelihood programmes

Protecting and enhancing livelihoods and adaptive capacity

Monitoring and early detection of diseases

Budget allocation for preparedness and response strategies in case of outbreaks

Produce bio pesticides

Rehabilitate and establish community health centres

Provide basic sanitation services to communities

Supporting and enhancing human health and welfare

Provide designs and resources for construction of sea walls, current breakers, and shifting dune bars

Artificially lower potentially dangerous lakes (e.g. in the case of GLOF)

Improve early warning systems to match the current demand of climate change effects

Provide radar reflectors and life vests for local fishermen

Flood and storm shelters

Physical safety: protection of life and property against climate extremes and disasters including along low lying and coastal areas

Distribute treated mosquito nets
Anticipate disease outbreaks in line with seasonal forecasts

Models
Communication systems
Systematic observing platforms and programmes
Maps, warnings, strategies, policies

Agriculture and food security: achieve and safeguard food security

Crop production

Develop tailor-made seasonal forecasts to manage planting dates and crop varieties
Crop-breeding for specific traits
Matching crops and provenances to conditions
Develop and strengthen large-scale irrigation schemes
Promote alternative production systems and technologies

Livestock production

Breed suitable fodder varieties and multiply indigenous grasses
Perform large scale re-seeding of rangelands and pastures
Encourage communal land management systems for grazing

Farm systems

Promote medium to large scale farm systems
Build farmers capacity for intensifying production through established support systems

Food systems

Design and implement agricultural insurance mechanisms
Food banks
Provide subsidies in agricultural materials and inputs
Build food/cereal banks
Promote small scale industries for food processing and preservation
Provide mechanisms for regional and global food trade

Water resources and water security

Integrate adaptation elements in budget allocation to related programmes

Develop national river basin and groundwater extraction potential sites

Promote nationwide water harvesting

Provide resources for rehabilitation of wetlands

Provide resilient designs of reservoirs, irrigation canals, ponds and dykes to local communities



Defining the adaptation component

- Given understanding of current system, need to define how climate change is likely to have an impact
 - Based on current climate variability and recent observed changes (in broad terms!)
 - And general projections for climate change for region
- Need to identify entry point for the system so can quantify outcomes of project intervention!
- Propose to focus on socio-economic/adaptation goal, rather than specific activities (e.g. focus on “Sufficient/improved local food production to ensure food security at community” as opposed to “implementing micro-irrigation at community level”)

Available resources for Agriculture and Food Security

- FAO – Agroecological zone analysis: data, models, projects for all countries
- UN Millennium Project: the food security component
- Many other agriculture agencies have studied the issue for many decades – lots of resources
- **CGIAR system – Best Bets for achieving food security (see presentation and handout)**



Additional LEG resources

- LEG has the examples in the Step-by-Step Guide – more resources will be made available on LDC Portal at www.unfccc.int/ldc
- More resources being assembled to support the design of projects in all the 10 Adaptation Goals, with a strong link to existing resources including from the implementing agencies
- Ideas welcome on how to improve these resources