



A FRAMEWORK FOR VULNERABILITY ASSESSMENT OF NON-TIMBER FOREST GOODS FOR PLANNING ADAPTATION TO CLIMATE CHANGE AND VARIABILITY IN WEST AFRICA

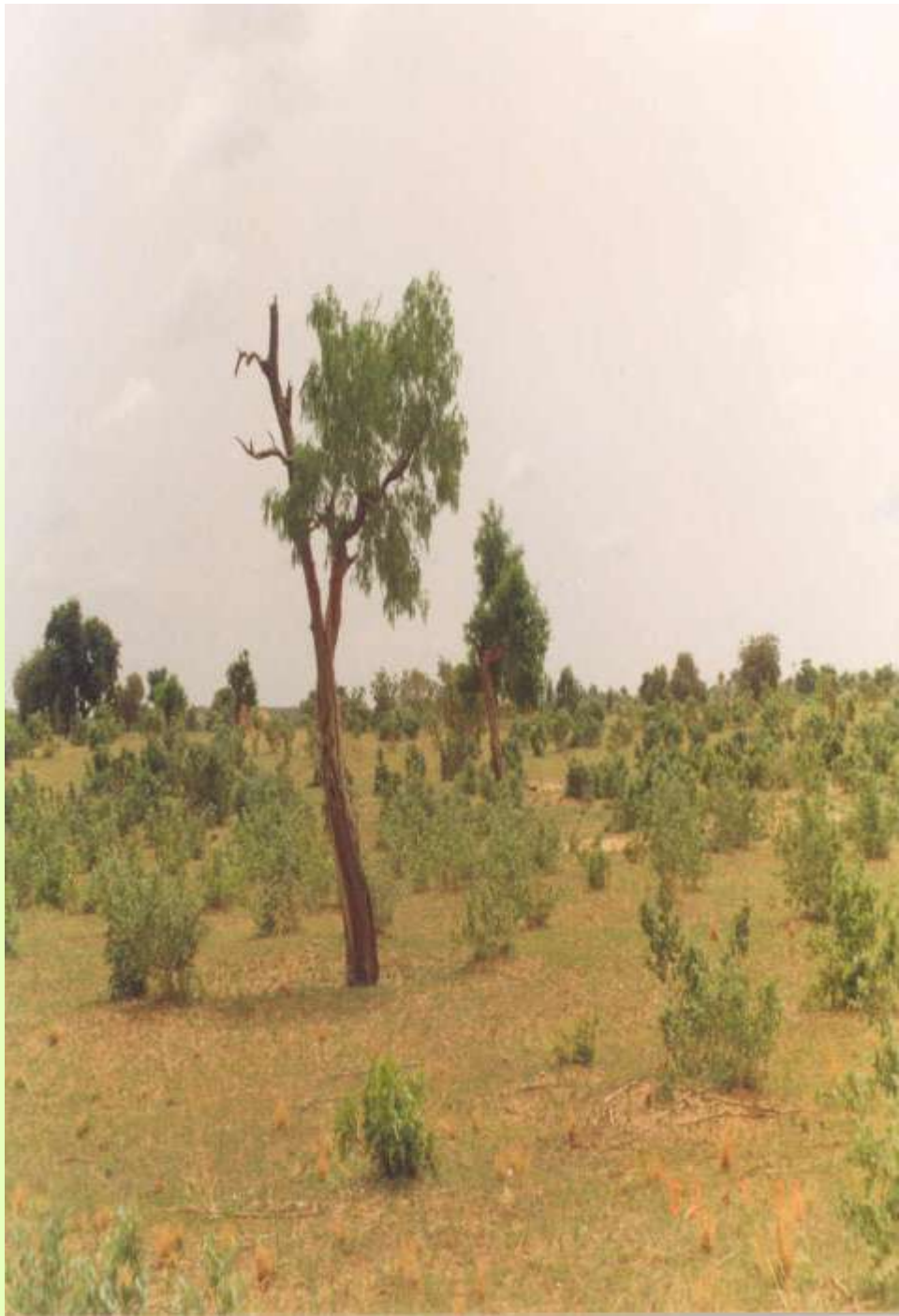
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Background

- Impacts of climate change point to fragility and vulnerability of Forest ecosystem
- Multiple uses of forest goods and services under climate change impacts
- National development goals
- Doubts about regional response capacity to climate change (a scenarios of 'business as usual')



Non-timber forest products (health and food):

- Forests are direct providers of health and food products.
- About 90% of the population in the region depends on forest herbs and tree products as first line of primary healthcare.
- Play important role in nutrition and food security, especially during periods of food shortages that usually coincide with drought periods.

Source: CONEDD 2001



Source, UNEP 2005





•Adaptation seems the only response available in dealing with climate change impact on forest ecosystem

Objective:

Elaborate a framework for assessing the vulnerability of the different forest ecosystem linked sectors selected by stakeholders

TroFCCA Objective 1

Contribute to the development of methodologies for understanding the vulnerability of sectors of forest ecosystem and the society that depend on it.

For effective adaptation measures with changing climate

Strategic Approach

- Recognition that response to potential CC impact on forest is linked to pro-poor agenda (esp. true in SSA)
- CC impact on forest will impact development in identified economic sectors that depends on forest
- Put forests ecosystems (Goods and services) in context of development (National economy & Livelihoods)
- Emphasis on stakeholder Participation

Macro and micro level scoping



Regional and National

Local



Vulnerability concept

- Vulnerability is a useful concept for analyzing sustainability
- It describes possible threats to the social-natural system and thereby threats to its sustainability
- Different approaches and methods are available and used in assessing vulnerability

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Framework:

Vulnerability a factor of:

- Exposure
- Sensitivity
- Adaptive capacity

Vulnerability is a Function of All Three

$$V = F (E_{(x,t)} +, S_{(x,t)} +, AC_{(x,t)})$$

(V= Vulnerability, E = Exposure, S=sensitivity, AC= Adaptive Capacity)

Exposure 1:

- Exposure is interpreted as the direct danger
 - facing the forest ecosystem and its dependent community
- Changes in climatic variables (temperature and rainfall)
 - intensity and frequency of extreme events such as droughts, floods
- Frequent droughts and flood in West Africa sahel
 - Soil erosion, difficult tree regeneration, reduced distribution of certain tree species (*Bombax costatum*, *Vitellaria paradoxa*, *Parkia biglobosa*),

Exposure 2:

- **Human activities**
 - Deforestation, fires, shifting cultivation
- **Changes in land surface characteristics through feedback processes**
 - Exacerbates droughts conditions
 - Supply to demand ratio gaps widens

Sensitivity

- The degree to which the system is modified by the stressors (Adger, 2006).
 - degree of degradation and fragmentation
- It is a function of human conditions and natural capital

Adaptive capacity

- Adaptive capacity is the ability of a system to adjust to climate change
- The adaptive capacity is determined using Schroter et al. (2003) three A components, of Awareness, Ability and Action

Principles

- **P1: The provision of relevant Non timber forest products by the forest ecosystems is vulnerable to climate change and variability**
- **P2: The socioeconomic system is sensitive to changes in the provision of NTFPs**
- **P3. The socioeconomic and governance systems is lacking adaptive capacity to respond to or to avoid changes in NTFPs**

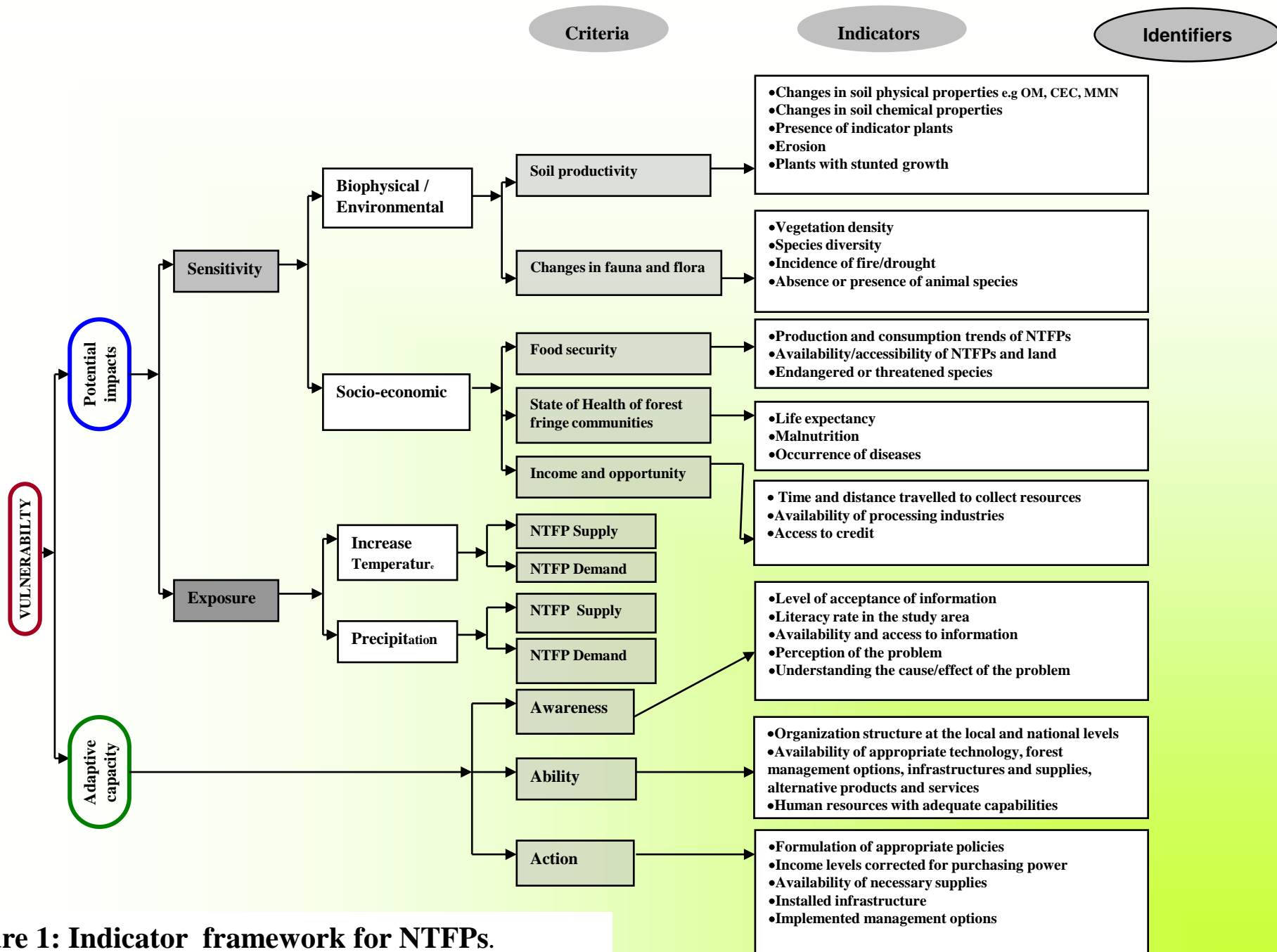


Figure 1: Indicator framework for NTFPs.

P1: The provision of relevant Non timber forest products by the forest ecosystems is vulnerable to climate change and variability

C11. NTFPs from ecosystem are exposed and sensitive to climate variability and change

- Precipitations and temperature trends
- Changes in soil physical properties (texture, infiltration, structure)
- Changes in soil chemical properties
- Presence of indicator plants
- Erosion (gullies, exposure of tree roots)
- Plants with stunted growth

C12. Given the state and pressure on ecosystem, natural adaptive capacity is low

- Vegetation density/structure (deforestation rate and regeneration)
- Fauna and flora diversity
- Incidence of fire/drought
- Insect/pest infestation
- Production and consumption trends of NTFPs

P2: The socioeconomic system is sensitive to changes in the provision of NTFPs

C21. The social system is highly dependant on non timber forest products

- Availability/accessibility of NTFPs and land
- Endangered or threatened plant and animal species (No. of endangered or threatened species)
- Life expectancy
- Contribution of NTFP to human health and treatment of the diseases
- NTFPs contribution to human body daily requirements for nutrients
- Contribution of NTFPs to family income

C22. Sustainable and cost effective substitutes for the lost of food and medicinal plant

- Time and distance traveled to collect resources (Medicinal plant)
- Availability of processing industries
- Access to credit
- Presence of health facilities

P3. The socioeconomic and governance systems is lacking adaptive capacity to respond to or to avoid changes in NTFPs

C31. The social system is lacking adaptive capacity to respond to or to avoid changes in NTFPs

- Availability and access to information on environmental issues especially on climate change
- Level of acceptance of information (i.e adaptation rates of new techniques and technologies)
- Literacy rate in the study area
- Understanding of the problem and its associated impacts
- Availability of appropriate technology e.g. irrigation in agriculture
- Availability of forest management options e.g. reforestation, enrichment planting, and agroforestry.
- Availability of infrastructure and supplies
- Availability of alternative products and services
- Income levels corrected for purchasing power

C32. The governance system is lacking adaptive capacity

- Organizational structure at the local, district and national levels for emergencies, capacity or preparedness of the population
- Formulation of appropriate policies and appropriate implementation of framing policies, and institutional capacity at all levels to implement, and to make use of adaptive space given by more local level oriented planning
- accountability structures from government towards the local population, which may hinder successful implementation or use of external financial support
- Implemented management options

Major point

- This framework presents an overview bottom-up generic indicators for the region of West Africa
- A simplified guide that will lend to ready references and motivate more researchers in the region to action.
- It will allow the assessment of specific policy to either alter the influence of the driver or to diminish the drivers' adverse effects on the all overall vulnerability
- A vehicle for addressing adaptation measures
 - after being tested and adjusted

**THANKS FOR YOUR
ATTENTION**