Technology Needs Assessment for Climate Change Adaptation in the Forestry Sector in Uganda.

Online Water Week: 13th-18th September, 2020

By: Zake J, Namirembe, S., Kasule D., Onapa, O. M.

Corresponding author: Dr. Joshua Zake (Ph.D.),
Executive Director, Environmental Alert

P.O. Box11259 Kampala, Uganda, Tel: 0414510215; Website:

http://www.envalert.org Email: ed@envalert.org or joszake@gmail.com

Personal website: http://ug.linkedin.com/pub/joshua-zake/23/45/181

Outline of the presentation

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B) Rationale for Technology Needs Assessments?

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F) Way forward

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1.0 Introduction/Context

- The forestry sector in Uganda comprised of the following tenure categories as described in the National Forestry Policy, (2001) (MWLE, 2001): **Central Forest reserves (constitute 15% of the total forest cover); Forests in wildlife and national parks (constitute 15% of the total forest cover); Forests on private and community forests (constitute 70% of the total forest cover).**
- Uganda's forest cover status has followed a **drastic negative trend during the last 30 years. Thus, it reduced from 24 to 9% of the total land area in 1990 and 2015.** This is largely attributed to key drivers of deforestation and forest degradation as described in the National Reducing Emissions from Deforestation and Forest Degradation (REDD) + strategy for Uganda (MWE, 2017 and FIP, 2017) including: ***expansion of commercial and subsistence agriculture; unsustainable harvesting of tree products, mainly charcoal, firewood and timber; expanding human settlements including growing numbers of refugees; free-grazing livestock; wild fires; artisanal mining operations and oil exploration.***
- The reported climate change and variability impacts (*such as: prolonged droughts, unreliable rainfall patterns, flooding*) (MWE, 2015) **exacerbate the forestry sector that is already facing huge pressures through provision of ecosystem services and forest products to the burgeoning Uganda population**, with an annual growth rate in Uganda is 3.3%, thus Uganda is ranked 32nd globally in 2018 and is estimated at 45 and 61 million Ugandans currently/now and by 2030, respectively (National Population Council, 2017).
- Were as there is **no comprehensive national climate change vulnerability assessment for Uganda across all the sectors including forestry**, the reported (NAPA, 2007) vulnerabilities in the forestry sector in Uganda include the following:

a. *emerging and proliferation of trees pests and diseases;*
b. *increased risk to destruction from wild fires due to prolonged droughts;*
c. *Increased encroachment on forests and forest land by community due to escalating land degradation and food insecurity among households with forest landscapes*

B) Rationale for Technology Needs Assessments?
- climate technology pathways for implementing the Paris Agreement

- **Technology Needs Assessments (TNA)** are a set of activities that identify and analyse climate change mitigation and adaptation technology priorities of developing countries. The process is ***country driven, implemented by national TNA teams*** with ***stakeholder involvement*** and ***capacity building. Its must be aligned with national development objectives*** and ***explore synergies with other national processes, strive towards implementation of countries pledges under the Paris Agreement***
- The TNA process therefore, **targets at identifying appropriate technologies for addressing these impacts to advance adaptation of the forestry sector to the climate change and variability.** The response action in terms of developing and promoting technology development for adaptation in the forestry sector should be *anchored within the existing forest tenure (i.e. protected forest/central forest reserves – 30% of total forest estate; Local forest reserves, community and forest on private land) and 7 forest landscapes across the country* as described in the Forest Landscape Restoration Opportunity Assessment Report for Uganda (MWE, 2016).

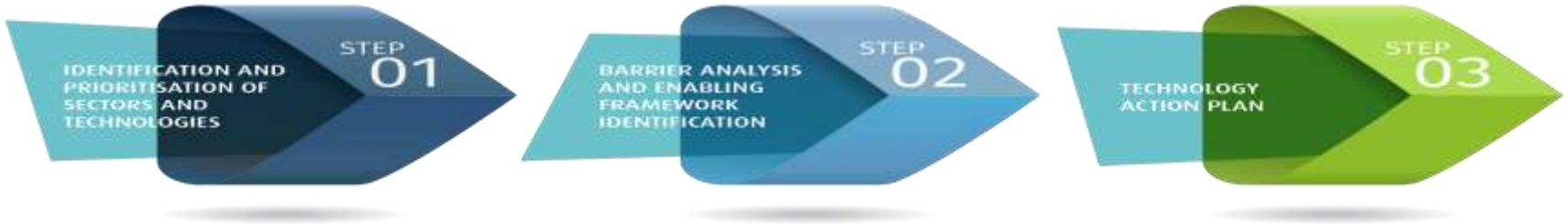
Status of implementation of the TNA project in Uganda

The implementation of the TNA for Uganda took a phased approach that involves 3 phases including:

Phase 1 *- Identification and prioritization of sectors;*

Phase 2 *- Barrier analyses and enabling framework identification; and*

Phase 3 *– Development of the Technology Action Plan.*



Adopted from the Technical presentation *made by* **Sara Trærup** *during the 1st regional workshop to the Global Technology Needs Assessment project III, held in February 2019 in Entebbe, Uganda.*

- This paper focuses on **phase 1 of the technology needs assessment (*i.e. Identification & prioritization of sectors & technologies*)** as applied to the forestry sector climate change adaptation.

C) Methods and tools

- The methods, tools and approaches used in the **Phase 1** of the Uganda TNA process was based on **the Step by Step; a guidebook for countries conducting a Technology Needs Assessment and Action Plan.**
- Furthermore, the process was highly interactive with involvement of key stakeholders in the forestry sector. The technologies for advancing adaptation in the forestry sector was based on the following criteria derived from the definition and concepts of climate change adaptation according to Johnston and Williamson, (2007).
- The technologies for advancing adaptation in the forestry sector for Uganda were identified through **literature review of available reports and other published documents** in respect to technology advancement from various countries as applied in the TNA and UNFCCC processes.
- However, one major challenge to this approach is the fact that there are **few available technology fact sheets on adaptation for forestry**. Those available have a bias on agriculture and forestry theme, with very few technology identified/documented that are specific to forestry.
- With this situation, then in the approach further **considered review of the definition and concepts of climate change adaptation** (according to Johnston and Williamson 2007) and as applied to the forest sector were considered with specific emphasis on the technical measures for forest adaptation. Thus, according to Locatelli et al. (2008), these technical measures are at **3 phases** including the following:

A) Measures for buffering systems from perturbations i.e. preventing fires (fuel break, fire suppression,); Management of invasive species, insects and diseases (removal of invasive, prevention of migration of invasive species, phytosanitary treatments); Managing post-disturbance phases (regeneration, restoration).

C) Methods and tools

B) Measure for both objectives i.e. Reducing other pressures on forests due to climate change impacts; Monitoring and ex-situ (*adjancent & within the forest landscape*) conservation.

C) Measures for facilitating shifts and evolution towards new states that are more adaptive or resilient i.e. Enhancing landscape connectivity (corridors, buffers,); Conserving biodiversity hotspots and ecosystems across environmental gradients; Conserving or enhancing genetic diversity in natural forests; Modifying natural forest management based on selective logging (see Guardiguata et al. 2008); Modifying forest plantation management (species and genotype selection, species mixes, thinning and harvest, age structure).

- Along these, the entry points for practical technology development for advancing climate change adaptation in the forests was considered/identified.
- After identification of the technologies, they were assessed against the following criteria:

---Technologies which had been tried and or tested/piloted in Uganda and or neighboring with similar ecological characteristics;
---Whether the technology delivers on the national priorities and aspirations as described in Vision 2040; National Development Plan II and sector strategic plans
---Feasibility, Relevancy, affordability for technology investment and related operation and maintenance costs
---Gender responsiveness/inclusiveness in application of the technologies

C) Methods and tools

- ***Compilation of the TNA Fact sheets***
- Fact sheets were developed for the identified technologies based on the format for generation of TNA fact sheets provided by the United Nations Environment Programme (UNEP) and UNEP DTU Partnership.

- Besides, the fact sheets were used as key reference materials that provided additional information to the participants during the TNA prioritization workshop for informed decision making.

- ***TNA stakeholder prioritization workshop***

This was a 2-days workshop during which the respective content for the identified technologies was validated – involving key representatives comprising of Government, Civil Society, and Private sector. Further the technologies were prioritized to come up with the top 3 for consideration in the subsequent phases of the TNA process.

The prioritization was based on the on the application of the **Multi Criteria Analyses (MCA) tool**, for which detailed information was provided by the consultants, including demonstration using some examples. The MCA involved assessment of the technologies in respect to their contributions on the following benefits: *Economic, Social, Environmental, Climate and economic costs.*

Scores of 0 (i.e. not favourable) to 100 (i.e. very favourable) were allocated to costs and benefits. Furthermore, weights were allocated to each of the technologies, according to urgency, importance in contributing to development priorities, applicability and suitability of the technology for adapting to climate change.

D) Key results

D.1 List Technologies identified to advance adaptation of the forestry sector in Uganda

1) Integrated wildfire management -
2) Enrichment planting for restoration of natural forests -
3) Promoting Forest based enterprises e.g. e.g. bee keeping/apiary; butterfly farming, fruit trees production; ecotourism
4) Application of tissue culture to hasten massive propagation/multiplication of tree seedlings
5) Advancing biotechnology to produce hybrids which are adapted to Uganda's climatic conditions
6) Promoting community woodlots for biomass energy production
7) Application/use of drones in forest management for effective monitoring
8) Promotion of bamboo value chains – production and processing/value addition and marketing
9) Promoting improved chainsaws to advance efficiency in timber logging
10) Promoting portable sawmills for onsite timber processing to advance efficiency
11) Promoting phytosanitary practices for diseases and pest control
12) Integrated pest management in forest plantations through promoting mixed species plantations
13) Use of hydrogels and hydroabsorbents to advance adaption to prolonged droughts impacting on forest plantations
15) Promotion of Farmer Managed Natural Regeneration (FMNR) for forest landscape restoration
14) Intercropping in forest plantations
16) Diversification in forest plantations
17) Integrated forestry-crop-livestock systems
18) Use of forest residues for biomass energy
19) Growing Trees for food i.e. Pormo-culture
20) Promoting energy saving stoves

NB: The order is not according to priority. This is just a short list!

5.0 List selected Technologies for advancing adaptation of the forestry sector in Uganda

1) Integrated wildfire management

2) Enrichment planting for restoration of natural forests

3) Promoting Forest based enterprises e.g. bee keeping/apiary; butterfly farming, fruit trees production; ecotourism

4) Application of tissue culture to hasten massive propagation/multiplication of tree seedlings

5) Advancing biotechnology to produce hybrids which are adapted to Uganda's climatic conditions

6) Application/use of drones in forest management for effective monitoring

7) Promotion of bamboo value chains – production and processing/value addition and marketing

8) Promoting portable sawmills for onsite timber processing to advance efficiency

9) Integrated pest management in forest plantations through promoting mixed species plantations

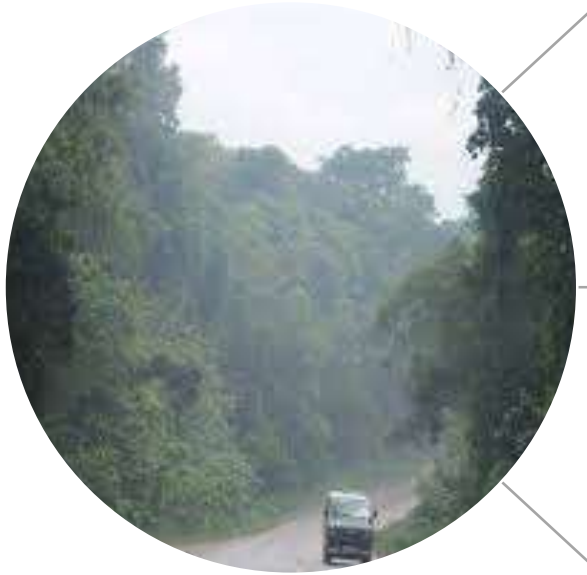
10) Integrated forestry-crop-livestock systems

11) Promotion of Farmer Managed Natural Regeneration (FMNR) for forest landscape restoration

12) Diversification in forest plantations

NB: The order is not according to priority. This is just a short list!

D.2 Prioritized Technologies for advance adaptation of the forestry sector in Uganda.



1

- **Farmer Managed Natural Regeneration** for *for forest landscape restoration*

2

- **Integrated Pest Management in Forest Plantations.**

3

- **Forest-based enterprises** – apiary, butterfly farming, orchards, ecotourism

Source: TNA Report for Uganda, 2019.

E) Conclusions and way forward

Conclusion

- The 1st phase of the TNA process for Uganda i.e. identification and prioritization of sectors and technologies for advancing adaptation in the forestry sector was successfully completed. It involved active participation of the different stakeholders.

Way forward

- With completion of this phase of the Uganda TNA process and guidance and decision made on the priority technologies for advancing adaptation in the forestry sector in Uganda, it's now timely to pursue the second and third phases of the TNA process.

- This will focus on the barrier analyses & enabling framework identification and associated development of the Technology Action Plans for the respective prioritized technologies to provide the framework for investment for advancing climate change adaption in the forestry sector in Uganda.

G) Acknowledgements

1. Forestry sector stakeholders, who actively participated in the stakeholders prioritization workshop;
2. Global Environment Facility;
3. United Nations Environment;
4. Technical University of Denmark, Partnership Centre on Energy, Climate and Sustainable Development;
5. Uganda National Council for Science and Technology;
6. Ministry of Science, Technology and Innovation.

Thank you for Listening.

Looking forward to your feedback –
questions- clarification – further information