Gender considerations for sustainable and soil-friendly mechanization and Technology in mountain ecosystems (Bhutan)

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Agriculture in Bhutan (scenario & issues)

Subsistence agriculture

- almost 70% of the land owned by women
- 48.7% - migrated to urban city -- Impact - women
Agriculture in Bhutan (scenario & issues)

- geographical size is 38,394 km².
- cultivable land - 2.93% of its entire area
- limited cultivable land - geographical and topographic features.
- 70% of the agriculture land located on steep slopes
- 31% - on >50% slope
- small land holding
- Gender friendly - default
- Vulnerable to annual soil loss - 29 T/ha (landslide/erosion)

- The CLEWS-model shows that, to meet the food demand in future will need to increase cultivated area by another 47%
- restore soil fertility, improve water availability
Agriculture in Bhutan (scenario & issues)

Farming in a mountainous ecosystem is challenged by:

- low soil fertility
- coupled with cold stress
- frequent weather swings.
- Soil erosions
Policies and Strategies to promote mechanization and sustainable land management (SLM)

Land development & SLM

- land development (CMU, NSSC)

SLM practices-
I. terracing
II. check dams
III. contours stone
IV. bunds
V. Terraces hedgerows
VI. Bamboo and planted trees

(EVALUATION OF SUSTAINABLE LAND MANAGEMENT AND INNOVATIVE FINANCING TO ENHANCE CLIMATE RESILIENCE AND FOOD SECURITY IN BHUTAN report)

- fallow lands were brought under cultivation
- About 7746 acres brought under SLM
- Increase to 12000 acres by 2030
- reduced soil erosion
- eased workability on steep terrain
- increased fodder availability through hedgerows plantation
- stabilized the land & source of monetary income
Policies and Strategies to promote mechanization and sustainable land management (SLM)

Machinery

- state-owned subsidized machinery hiring services
- allotment to local government bodies
- soil-friendly machines (mini tiller, reaper, transplanter, direct seeder & Powe tiller)
- Norma power tiller – 9% s degree
- Extension device – 18.5 degree
- R&D - gender friendly technologies climate resilient technologies.
- Efficient water use technology
- IoT

- Water harvesting
- hydroponic
- Micro irrigation
- Bunds clearing
- Direct seeding
- Bed making
Policies and Strategies to promote mechanization and sustainable land management (SLM)

**Machinery**

- Training - Incentive of Minimum daily allowances, free accommodations
- Awareness and hands on training at site

**Financial Support**

- Multilateral donors - promotion
- Low interest credit to purchase machine
- Zero Tax on farm machinery
Conclusion

• Undulling topography, limited financial support, shortage of farm labor, small land holding, and human-wildlife conflicts – main issue

• Need to further sensitize the general public and build their capacity

• Further explore funds from external donors to scale up SLM activities and mechanization in the country