Building Climate Resilience in Livestock and Fodder Management

Case of Uzbekistan

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Comparing Change Over Time

Climate change: 3.7°C by 2100
Expectation Due To Climate Change

Reduced forage production, reduced lamb production (5-25%) (WBGU (German Advisory Council Global Change)-2007)

Climate change, according to the World Bank’s Country Partnership Framework for Uzbekistan (World Bank, 2016), will result in higher temperatures, greater variability in precipitation, and increased frequency of extreme weather events.

When CO2 concentration is doubled: Amudarya (40%) and Syrdarya (28%) basin water loss (IPCC, 2004)
• The livestock sector contributes about 40 per cent of the country’s agricultural GDP.
• Most production comes from the 4.7 million small dehkan farms.
• Dehkan farmer’s own/produce:
  • 95 percent of cattle and
  • 83 percent of goats and sheep;
  • 95 percent of the total production of meat,
  • 96 percent of milk.
• Average cow milk yields within dehkan farms rarely exceed 6 kg per day with lactation periods of just 7 months.


Meat production in all categories of farms in the Republic of Uzbekistan, thousand tonnes (2011-2019)
Livestock farming uses the largest amount of land in Uzbekistan, with over 50 percent of the land area used as desert and mountain pasture, as well as part of the irrigated land.

Improved animal flocks can address climate change issues in the country.

Important to introduce improved varieties of heat and drought tolerant forage crops/varieties/hybrids, best agronomic practices and crop rotation for coping with climate change.

Good pasture rotation management can directly respond to climate change through improvement of pasture conditions.
Diversification of Production to Build Resilience:  
Milking Karakul Ewes
Breeding Programs - Decentralized & Participatory Breeding Plans

Fat tailed sheep
- Improved rams from research breeding station
- Joint selection by farmers and researchers
- Rams shared by community

Mohair goats
- Selection of best bucks in village flocks
- Improved mating schemes
- Identification and recording
- Forming spinners’ flocks
Improved & Resilient Tillage Practices

Effect of tillage on dry matter yield of forage crops

- **Corn**
- **Forage pea**
- **Pearl Millet (EERCC1)**
- **Pearl Millet (HVGC)**
- **Pearl Millet (ICMB 05222)**
- **Pearl Millet (ICMV 05777)**
- **Sorghum (Karambas)**
- **Sorghum (Daulet)**
- **Sorghum (Vakhsh)**
- **Sudan grass**

- **Crops**
- **NT**
- **CT**

- **l.s.d.** 2770.9
- **cv%** 91.3
- **TILLAGE.CROPS** 0.031

Effect of tillage method on grain yield of forage crops

- **Sudan grass**
- **Sorghum (Vakhsh)**
- **Sorghum (Daulet)**
- **Sorghum (Karabas)**
- **Pearl Millet (MC9402)**
- **Pearl Millet (ICMV 05777)**
- **Pearl Millet (ICMB 05222)**
- **Pearl Millet (HHVBC)**
- **Pearl Millet (EERCC1)**
- **Forage pea**
- **Corn**

- **Crops**
- **CT**
- **NT**

- **l.s.d.** 247.8
- **cv%** 32.0
- **TILLAGE.CROPS** <.001
Growing Vetch

Drought tolerant forage legumes such as vetch offer many options to cereal-livestock farmers:

- can be grazed while green in spring
- can be cut as hay and used to bridge the fallow feeding gap
- can be left to reach maturity in the field and grazed during the summer as an alternative to cereal stubbles

A profitable option to spare stubble, increase carrying capacity and productivity over mechanical fallow
Alley Cropping
Reduces pressure on stubble and helps meet the sheep nutrient requirements

- Major benefits of alley cropping
  - Provides fodder in times of scarcity
  - Provides rich and diverse diet for livestock
  - Improves soil fertility and reduces soil erosion
  - Reduces evapotranspiration

- Main Challenges
  - Availability of healthy seedlings at public nurseries
  - Shrub/tree seedlings require protection from grazing in the establishment year
  - During first summer, irrigation may be needed
  - Weed management

No reduction in crop yield occurred during the establishment year of the shrubs/trees. Once established, the extra forage production and agro-ecological benefits of shrubs will be expected.

Key method to provide green fodder for livestock and is more resilient to future climate change scenarios in Uzbekistan
Rangeland Management: Facilitating Mobility

- Mobile flock formed from small flocks
- Facilitation of rotation between summer and winter ranges
Rangeland Rehabilitation and Improvement of Hayfield

Improvement of productivity of hayfields in natural ranges

- Nitrogen application in hayfields
  Seeding of sainfoin

Improvement of productivity of natural rangeland

- Reseeding with native rangeland species (Kochia, Haloxylon) and
  (Kochia and saltwort)
Seed Isles and Streep Planting can Improve Pasture Condition

In the long term the seed isles will increase number of plant species, decrease pasture degradation and build climate resilience in fodder management.
New Equipment for Fodder Crops

- Small corn harvester
- Hay chopper
- Fodder grain chopper
- Drones
- Grain thresher
- Fodder thresher
Recommendations

• Support improved pasture rotation and rehabilitation practices as well as fodder production to enhance agricultural output through local production of agricultural equipment including smart agricultural machines, agricultural drones etc.

• Necessary to cooperate with research institutions (scientists of research institutes on livestock, mechanization and pasture & fodder management)

• Develop agricultural mechanization strategy in the country taking into account climate change scenarios
**Recommendations**

Increase financial flows and investments in livestock production and fodder management in order to address climate change challenges in the country.

Introduce a comprehensive, nationwide policy for climate-change adaptation.

Implement forage crop diversification techniques that increase fodder production, improve food security and nutrition, increase incomes, and contribute to adaptation to climate change, thereby improving the livelihoods of the beneficiaries.