SUSTAINABLE DRY LAND RESOURCES MANAGEMENT FOR ENHANCED LIVELIHOODS, FOOD SECURITY AND CLIMATE CHANGE ADAPTATION IN SOMALIA

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Mapping and assessment of vegetation cover change and their impact on sustainable livelihoods, food security and climate change adaptation in Somalia

Summary

Land use and land cover change caused by human activities is one of the primary drivers of terrestrial biodiversity changes and loss today (Momo et al., 2018). A study to investigate the impacts of vegetation and land cover changes on livelihoods in Jubaland, Puntland and Galmudug States of Somalia was initiated using a remote sensing-based vegetation baseline assessment as a strategy for informing policy makers on the sustainable governance and development of the forestry sector. This is necessary to understand the dynamic nature of local vegetation and land cover types that may have been impacted over time. The policy note analyzes the dynamics of vegetation and land cover changes in Somalia between 2010 and 2022.

Recommendations

Recommendations to reduce deforestation / degradation of woodlands, contribute to the sustainable supply of wood energy and charcoal, and reduce the impact of agricultural and livestock activities on woodlands include:

Adoption of reforestation on a wide range of lands in the area, and restoration of degraded areas.

Incorporate multipurpose trees in the existing farming systems as well as natural regeneration initiatives notably through Farmer-Managed Natural Regeneration (FMNR) or enclosures which will go a long way to reduce pressure on the natural vegetation and promote self-sufficiency among agro-pastoralists.

Creation of community plantations for wood energy and charcoal.

Designation of areas for livestock activity, securing of pastoral areas and organization of herders.

Promote use of improved stoves and encouraging the use of renewable energies even the most remote areas.

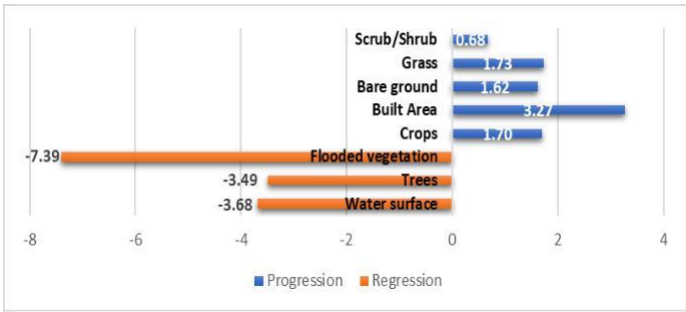
Promote environmental education at all levels to create awareness on the ecological importance of trees.

Address conflicts to contribute to reducing overgrazing pressures.

Changes in land use categories in Jubaland State

The land use class that has increased the most is scrub/shrub, which has increased from 8,687,895.86 ha in 2010 to 9,359,923.72 ha in 2022, an increase of 672,027.86 ha, corresponding to an annual rate of change of 0.68%. Residential areas have also increased dramatically from 8,279.04 ha in 2010 to 11,857.60 ha in 2022, i.e. an increase of 3,578.56 ha corresponding to an annual rate of change of 3.27%. Wetlands have drastically decreased from 3,164.77 ha in 2010 to 1,403.08 ha in 2022, a change of 1,761.69 ha for an annual change rate of 7.39%. Tree areas (forests), however, have regressed dramatically from 2 208 660 ha in 2010 to 1 503 850 ha in 2022, i.e. a loss of 704 810 ha, corresponding to an annual rate of change of 3.49%.

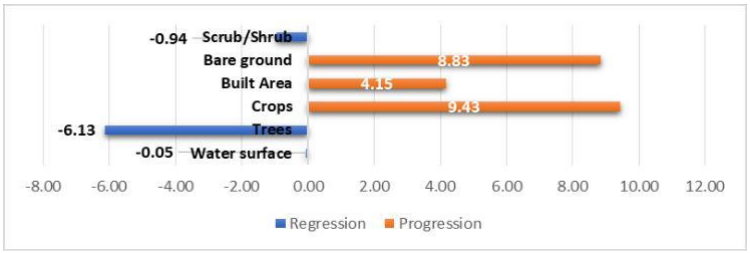
Land cover	Area (2010)	Area (2022)	Change of surface area	Annual rate of change
Water surface	39 795,60	26 540,40	- 13 255,20	-3,68
Trees	2 208 660	1 503 850	- 704 810,00	-3,49
Flooded vegetation	3 164,77	1 403,08	- 1 761,69	-7,39
Crops	56 564,80	68 232,10	11 667,30	1,70
Built Area	8 279,04	11 857,60	3 578,56	3,27
Bare ground	166 751	199 291	32 540,00	1,62
Grass	62,83	76,01	13,17	1,73
Scrub / Shrub	8 687 895, 86	9 359 923, 72	672 027,86	0,68
Total	11 171 173, 90	11 171 173,9 0		



Changes in land use categories in Puntland State

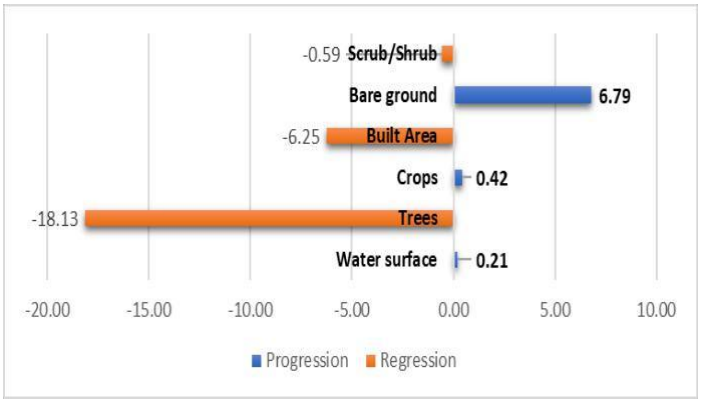
Different land use categories have significant changes. Cultivated areas increased from 1 851.41 ha in 2010 to 5 223.73 ha in 2022, an increase of 3 372.32 ha, with an annual rate of change of 9.43%. This expansion of cultivated land can be explained by demographic growth, coupled with migration of populations to the state. Tree cover declined dramatically from 62 573.60 ha in 2010 to 31 876.30 ha in 2022, a loss of 30 697.30 ha, corresponding to an annual rate of change of 6.13%. Residential areas have almost doubled from 4,931.56 ha in 2010 to 7,788.73 ha in 2022, i.e. an increase of 2,857.17 ha for an annual rate of change of 4.15%. This increase in surface area can be justified by the proliferation of new villages, the main cause of which is growing insecurity in the area.

Land cover	Area (2010)	Area (2022)	Change of surface area	Annual rate of change
Water surface	31 104,90	0 941,20	- 163,70	-0,05
Trees	62 573,60	31 876,30	- 30 697,30	-6,13
Crops	1 851,41	5 223,73	3 372,32	9,43
Built Area	4 931,56	7 788,73	2 857,17	4,15
Bare ground	923 569	2 440 480	1 516 911	8,83
Scrub / Shrub	15 116 029,49	13 623 750	- 1 492 279,49	-0,94
Total	16 140 059,96	16 140 059,96		



Changes in land use categories in Galmudug State

In Galmudug State between 2010 and 2022, tree areas suffered the greatest loss, at 103,402.70 ha for an annual rate of change of 18.13%. Bare ground recorded a gain of 6.73% or 587,881 ha. Residential areas also recorded an increase of 6.25%, corresponding to an area of 2 118.50 ha. As for cultivated land, it recorded a gain of 0.42% of land cover, corresponding to 85.67 ha during this period.



Perceptions of change

Deforestation occurs in two forms: land conversion for other uses, mainly crop production/buildings (urbanization), and cutting of woody plants in search of extra income or for household consumption, i.e. for energy, construction, fences etc.

In the project area in Guricel, Galmudug, •Kismayo, Jubaland and Garowe and Bossaso, Puntland, charcoal burning is graded as the second biggest cause of deforestation and desertification as indicated by the respondents. For the last fifteen years, charcoal trading was among the most important export commodity in the country, generating millions of dollars per year. As a result of prolonged civil war and frequent droughts many pastoralists and agro-pastoralist ended up as IDPs. Therefore, due to lack of other opportunities, many poor people (IDPs) found charcoal burning as an option for income generation (tragedy of the commons). The price of the charcoal depend on the quality of the charcoal; the best quality is the one with high energy efficiency and of course every tree cannot produce good quality charcoal. Thus, charcoal burners target specific tree species. Among the most extensively logged trees for charcoal production are the centenarian trees of *Acacia tortilis* and *Acacia busei*. These trees are important multi-purpose trees with high socio-economic and ecological benefits. Exploitation activities on the aforementioned species therefore cause uncountable social and environmental problems. For the last ten years, the civil society, scholars and international NGOs have mobilized to put an end to charcoal burning. In response the local administrations in the project areas also issued a law banning cutting of living trees of *Acacia tortilis and Acacia busei.*

Land cover	Area (2010)	Area (2022)	Change of surface area	Annual rate of change
Water surface	25 513	26 097,20	584,20	0,21
Trees	119 687	16 284,30	-103 402,70	-18,13
Crops	1 792,46	1 878,13	85,67	0,42
Built Area	4 262,93	2 144,43	-2 118,50	-6,25
Bare ground	533 502	1 125 620	592 118	6,79
Scrub / Shrub	7 718 946,67	7 231 680	-487 266,67	-0,59
Total	8 403 704,06	8 403 704,06		

However, due to lack of capacity for law enforcement, the problem continuous unabated. On the other hand, the law permits utilization of dead tree(s) of these species for charcoal production; therefore, the charcoal burners have developed new techniques. According information obtained from focus group discussions and key informant interviews, both charcoal burners and firewood collectors contaminate tree's root systems in order to kill the tree (s) by applying salt and used engine oil at the root level thereby killing the trees which are subsequently used for charcoal production or as firewood.

Literature

- Momo, S.M.C., Wouokoue, T.J.B., Njouonkou, A.L., Temgoua, L.F., Zangmene, D.R. and Ntoupka, M. (2018). Land-Use/land-cover change and anthropogenic causes around Koupa Matapit Gallery Forest, West-Cameroon, Journal of Geography and Geology; Vol.10,No.2; ISSN 1916-9779.

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