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Comparative Analysis of Ruminant Grazing Itineraries and Foraging Behaviour Across Three Agro-ecological Zones of Burkina Faso

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Abstract

Mobility is key for livestock production in the agro-pastoral systems of West Africa. Population growth and increased climatic risk of crop failure lead to cropland expansion which affects herd mobility and access to forage resources to varying degrees across agro-ecological zones. Therefore we studied the spatio-temporal variation in the use of grazing areas and the foraging time of ruminants in the southern Sahelian, northern and southern Sudanian zone of Burkina Faso by monitoring three herds each of cattle, goats and sheep in three village territories during a one-year cycle. Grazing routes were tracked using a Global Positioning System; coordinates logged at 10 s intervals were overlaid on land use maps from where time and activity on different land units was derived.

Maximum itinerary lengths (km/d) were observed in the hot dry season (March-May); they were longer for sheep (18.8) and cattle (17.4) than for goats (10.5, $p < 0.05$). Total time on pasture (h/d) ranged from 6–11 with cattle staying longer on pasture than small ruminants ($p < 0.05$). Feeding time accounted for 0.52–0.72 of daily time on pasture irrespective of species. Herds spent longer time on pasture and walked farther distances in the southern Sahelian than the two Sudanian zones ($p < 0.01$), while daily feeding time was longer in the southern Sudanian than in the other two zones ($p > 0.05$). Proportional time spent resting decreased from the rainy (June-October) to the cool (November-February) and hot dry season ($p < 0.05$), while in parallel the proportion of walking time increased. Feeding time of all species was to a significantly high proportion spent on wooded land (tree crown cover 5–10 %, or shrub cover >10 %) in the southern Sahelian zone, and on forest land (tree crown cover >10 %) in the two Sudanian zones, irrespective of season.

We conclude that with the expansion of cropland, remaining islands of wooded land, including also fields fallowed for 3 or more years, are particularly valuable pasturing areas for ruminant stock. Measures must be taken that counteract the shrinking of wooded land and forests across the whole region, including also active protection and (re)establishment of drought-tolerant fodder trees.

Keywords: Agro-pastoral system, global positioning system, livestock, Sahelian zone, Sudanian zone

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