



Tropentag, September 19-21, 2012, Göttingen -
Kassel/Witzenhausen

“Resilience of agricultural systems against crises”

Development of a New Low Cost Long Time GPS-device for the Recording of Grazing Itineraries

UWE RICHTER¹, DAVID DUBA GOLICHA², CHRISTIAN HÜLSEBUSCH³, BRIGITTE KAUFMANN³

¹*University of Kassel, Agricultural Engineering, Germany*

²*Kenya Agricultural Research Institute, Marsabit Research Centre, Kenya*

³*German Institute for Tropical and Subtropical Agriculture (DITSL), Germany*

Abstract

Knowledge about grazing itineraries is important in order to understand decision making processes in pastoral production systems. Recently the use of GPS-technology has enabled a detailed spatial description of animal and herd movements in pastoral systems. Researchers either follow herds themselves - or equipped herders - with handheld GPS devices to record larger scale movements of entire herds, or place collars on individual animals to track herds or record individual animal movements on pasture. Animal or herd GPS data yields particularly informative data on grazing management in extensive livestock systems if recorded for longer periods and over different seasons and on larger numbers of animals or herds simultaneously but both above GPS-devices have disadvantages for expanded studies. Most handheld devices have a battery life of only around 24 hours and therefore require daily maintenance, whereas GPS-collars are too expensive to be used on many animals or in many herds simultaneously. The goal of this study was to develop a GPS-tracking device with the capacity to record the daily herd movements for a long period of time at reasonable cost. Commercial low price GPS-tracking devices, which require no maintenance, were combined with solar backpacks to warrant energy supply for the GPS. Two types of solar backpacks and three types of GPS-trackers were used and tested with Gabra pastoralists in northern Kenya. The devices were given after a short briefing to three herders, each of which carried the backpacks when herding their goats for 2 consecutive months. During this period, each herder was visited thrice to download data and monitor equipments. The combination of the VOLTAICTM solar charger backpack and the WintecTM WBT 202 GPS proved reliable and recorded data for 65 days with a total of 685 hours and 933 km of recorded tracks. On average the herder moved 10.5 hours per day a distance of 21.9 km with an average speed of 2.09 km h⁻¹. A combination of a solar backpack with a GPS-tracking device is a reliable long term and low cost alternative for recording grazing itineraries.

Keywords: Daily herd movements, GPS-technology, grazing itineraries, herd tracking, low cost, pastoral production