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“Bridging the gap between increasing knowledge and decreasing resources”

## Resource Use and Resilience of Goat Production Systems in Pernambuco, Northeast Brazil

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### Abstract

The construction of the Itaparica dam affected the agricultural production systems in the semi-arid Itaparica region, São Francisco river basin. Fertile land has been inundated and thousands of farmers had to resettle. Traditional production systems – mainly a combination of cropping in the river floodplains and extensive livestock (mainly goat) farming in the adjacent dryer areas, based on the available natural resources – were partly replaced by irrigated cropping as a compensation measure. The study evaluates the implications of resource use on the resilience of different goat production systems affected by the Itaparica dam. Hundred-twenty goat keepers were interviewed. They represent five types: resettled farmers in irrigation schemes; resettled farmers and non-resettled farmers outside of these schemes, both with and without irrigation. Labour demand of goat production was low in all production systems and the natural vegetation (Caatinga) served as primary feed source. According to farmers, plant density has decreased over time leading to a lower feed supply. Due to the extended drought in 2011/2012, additional fodder had to be bought to maintain the goats, nevertheless 7% died. The share of income from goat production on total income was low (3–4% in the three groups of resettled and 6% in the two groups of established farmers). The economic efficiency of goat production was however higher in farms within the irrigation schemes, where feed supply was slightly better due to the higher availability of crop by-products. Here, two-thirds used dung as fertiliser for cropping. In comparison, 41% of established farmers with own irrigation and 4–13% of the remaining farmers outside these schemes made use of the goat dung. The stronger integration of goat with crop production sustained the survival of animals and thus the resilience of goat production within irrigation schemes. Likewise, using dung as fertiliser contributed to nutrient cycling within these systems. The majority of the goat flock is however kept outside the newly established irrigation schemes. The resilience of these production systems is more crucial since recurring droughts may lead to further scarcity of natural feed resources.

**Keywords:** Caatinga, irrigation schemes, resilience, semi-arid, small ruminants