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## Characterizing the Human-Nature Relationship and its Changes Using Mefa in Angola: A Village Case Study

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### Abstract

The Cubango-Okavango River Basin (CORB) is undergoing rapid socio-economic changes which will affect land use and the CORB ecosystem in the near future. What exactly the current land and resources use patterns are in rural areas of the CORB and towards which state they will transition is unclear. Our case study gives a close-up analysis of the Cauololo society, southern Angola, in the up-stream part of the CORB, with the purpose of assessing its socio-metabolic regime and to qualify its possible transition paths. First, a Material and Energy Flow Analysis (MEFA) was conducted in order to analyse the socioeconomic metabolism of the village. Data were collected from 2012 to 2014 among all the 252 members of the 25 households of the Cauololo village using household and personal surveys, observation, and diet diaries. In addition, we analysed conflicts related to agricultural production in the CORB, for which 33 face-to-face interviews were conducted in 2013 with stakeholders in Angola. Our results put Cauololo at the beginning stage of an agrarian regime with a high dependence on hunter-gatherer practices. The itinerant slash-and-burn agricultural system practised in 2014 was qualified as sustainable. All households practice subsistence agriculture, about 1/3rd of the production is sold and about 30 % of the calorie intake comes from imports into the village. The material stocks of the system were growing at a rate of 6.7%/year mostly due to the recent trend of change in building materials used. These figures suggest that Cauololo is adopting features of industrial socio-metabolic regimes, yet mostly in the consumption rather than in the production activities. At the larger scale, a change in production socio-metabolic regimes is, however, becoming apparent through investors appropriating land and implementing agro-industrial agriculture schemes. The current land tenure system, the pace of government-intended increase in the agricultural production and the lack of knowledge support for smallholders are major obstacles to a favourable transition. Therefore it remains doubtful whether the Cauololo and similar societies in the CORB will be able to join the industrial socio-metabolic regime themselves, whether they will co-exist next to an industrial agriculture, or become marginalised and environmentally damaging.

**Keywords:** Material and energy flows, Okavango River Basin, smallholders, stakeholder perceptions, sustainable intensification