

Moxos – the Water Kingdom: Integrating Remote Sensing and Landscape Archaeology in the Amazon Basin of NE-Bolivia

As a part of the Southwestern Amazon drainage basin, the Llanos de Moxos (Moxos lowlands) in NE-Bolivia are among the largest seasonally inundated savanna landscapes in the world. The Moxos scenery is dominated by a complex pattern of savanna grasslands, wetlands, gallery forest and forest islands. Population density is extremely low and the main economic income results from extensive slash-and-burn livestock breeding.

The Llanos de Moxos are famous for their ethnic diversity and have early been noted for a rich archaeological record. Only with remote sensing, though, the Llanos de Moxos landscape has been identified as a richly patterned man-shaped landscape with complex earthworks.

The earthworks mentioned comprise several morphological and archaeological features of different scale and function (MANN 2000). Various types of housing and burial mounds have been reported from the entire area, as have been raised fields. As in other parts of South America, the raised fields are small elevated platforms divided by canals that provided water as well as nutrients to the poor tropical soils.

In addition there are several strikingly larger forms visible as vegetation lines crossing the savanna plains (Fig. 1). While small and irregular lines have been interpreted as pre-Hispanic fish weirs, the larger and straight forms were found to be earthen causeways. As they are in many cases associated with water canals, the causeways likely served multiple purposes, namely transportation and the diversion of floodwa-

ters. The association of these different landscape elements draws a picture of a man-made hydraulic system, which allowed the combination of efficient agriculture and fish-farming.

The occurrence of earthworks over such an extensive area implies the existence of a complex pre-Hispanic network between well developed indigenous peoples. Thereby it adds a further perspective to the controversially discussed question whether there existed sophisticated pre-Hispanic societies in the Amazon basin (e.g. MEGGERS et al. 2003), despite the apparent limitations given by poor Amazonian soils. Whatever these communities might have looked like, their pure existence in the Amazon basin during pre-Hispanic times is far from being general knowledge and should change the concept of an entirely pristine Amazon rainforest.

Probably the most controversial phenomenon in the Llanos de Moxos is the occurrence of several hundreds of almost exclusively rectangular shallow lake basins (Fig. 2) of varying size with sharp vertical banks, all of them aligned with their long-axis at 45°–50° SW-NE. Frequently a network of canals interconnects these lakes.

First identified on remote sensing data in the 1960s, they have been variously interpreted as being due to deflation during Pleistocene dry phases, to neotectonic propagation of basement faults through the thick Quaternary basin fill deposits or to Holocene catastrophic flood scouring (e.g. DUMONT & FOURNIER). Field evidence is still lacking,

but in the context of the above-described earthworks an at least partly anthropogenic origin has to be taken into consideration, possibly being an important component of the hydraulic system established by pre-Hispanic indigenous peoples for both agriculture and fish-farming (CEAM 2003).

The pure existence of the above-mentioned assemblage of earthworks in the Llanos de Moxos is a document to various forms of pre-Hispanic land-use techniques, most of which clearly differ from those practised in the region today, attributable to an extremely sophisticated comprehension of natural processes as an essential precondition for economic and sustainable land use, which today is in many ways the exception in Bolivia.

References

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Fig. 1 (right, above)
Causeways (green straight lines) and canals (green zigzag lines) in the Baure region of the eastern Llanos de Moxos (Source: Landsat ETM data 231/70, band combination 5/4/3)

Fig. 2 (right, below)
Rectangular lakes in the Llanos de Moxos north of Trinidad. Note examples of filled lakes (black arrows) and canals (blue arrows; Source: Landsat ETM data 232/70, band combination 5/4/3)

JAN-HENDRIK MAY (Bern) &
UMBERTO LOMBARDO (Trinidad)

