ENVIRONMENT AND MAN IN THE YOUNG COASTAL PLAIN OF WEST SURINAME

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Résumé

Cette communication traite des données archéologiques et géologiques du littoral de l'ouest de Surinam. Les processus dynamiques reconnus par les données géologiques et archéologiques ont un trait en commun : les dynamiques orientées est-ouest sont caractéristiques de tous les processus et développements observés. Ceci démontre la forte inter-relation entre les développements côtiers et l'occupation humaine dans cette aire durant la Préhistoire.

Abstract

This paper discusses archaeological and geological data of the coastal area of west Suriname. The dynamic processes recorded by geological and archaeological data have one feature in common : east-west oriented dynamics are characteristic of all processes and developments observed. This demonstrates the strong interrelationship between coastal developments and the human occupation of this area in prehistory.

Mots-clés : archéologie, géologie du littoral, Surinam.

Key words : archaeology, coastal geology, Suriname.

INTRODUCTION

Earth scientists study the developments of landscapes; archaeologists the human activities that occurred in these landscapes in the past. The data of the former are useful for the latter and vice versa.

This especially is true in coastal areas. There we find three ecozones (habitats), each with a characteristic soil type and vegetation (and fauna): zones dominated by salt-, brackish-, and freshwater, respectively. This landscape was particularly attractive to prehistoric man.

Villages often are found in the fresh-water dominated area at such locations that all three ecozones can be exploited: in the Guianas just south of the brackish - freshwater boundary. Different food types and other useful items can be found in each of the ecozones. An excellent environment for populations with a broad-spectrum-economy.

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The large, relatively low coastal areas and wetlands of Suriname, Guyana, and the west of French Guyana had that attractivity to prehistoric man: numerous Indian settlements were situated in such a border-situation, like the sites discussed in this paper.

Archaeological research has stopped since some 5 years ago in Suriname. The situation is more favorable in the field of earth sciences: relevant discussions on the development of the coastal plain of Augustinus *et al.* (1989), Rine & Ginsburg (1985), Teunissen (1989), and Wong (1989), among others, contribute to an understanding of some of the developments.

This paper tries to integrate some of the archaeological data and insights reached in the last 25 years into the geologic data of the landscape of west Suriname. What conclusions can be drawn from dated archaeological contexts on the development of the landscape? This discussion focuses on the interrelationship between periods of long-standing fresh-water regimes in the coastal wetlands, human settlements exploiting that ecozone (and the brackish- and salt-water ones) and the long-term development of coastal Suriname.

THE DEVELOPMENT OF THE YOUNG COASTAL PLAIN IN SURINAME

Two sets of data describe the development of the Young Coastal Plain of west Suriname. These sets of data do not fit without problems. They are the result of 2 types of research:

1. conventional geological research focussing on the stratigraphy
2. studies of the present coastal developments consisting of erosion and growth of the coast, of mud, sand and shell transport and deposition.

The former research primarily studies the subsoil, the latter air photographs of the past 40 years and ongoing deposition and erosion.

An important phase in the development of the coastal plain occurs ca 6000 years ago: the sea level reaches its present level. The coast line of west Suriname is situated 30-60 km south of the present one in that period of time. The Coronie-deposits are now in that area subdivided into:

1. the Wanicaphase (deposited ca 6000-3500 BP)
2. the Moleson phase that starts ca 2800 BP
3. the youngest, the Comowine phase lasts up to now.

These phases were distinguished by Brinkman & Pons (1968) on a lithological basis, and in combination with ^{14}C datings. These depositional phases are

interpreted as periods in which marine influence (resulting in clay deposition) dominated coastal developments.

The periods between Wanica and Moleson and between Moleson and Comowine are interpreted as periods of non-deposition c.q. of erosion (Roeleveld & Van Loon, 1979). As a result of the erosion sand is transported to the coast and cheniers are deposited.

This state of affairs may result in less or no marine influence in the hinterland. There peat grows locally under prevailing fresh water conditions. The fresh-water is adduced by creeks from the south.

This present landscape is the **net end-result of all processes in action.** This implies that we have no evidence of processes that are not represented in this end-result. For instance, if the Suriname coast was situated 2 km north of the present one 600 years ago and if that part of the coast eroded away since that time without leaving a trace to us, we cannot see the reflection of this process in the present landscape.

We understand at present the dynamic processes that predominate the coast-formation processes much better than before, thanks to the studies of Augustinus, Rine & Ginsburg, and others.

A large quantity of Amazon clay is transported along the Suriname coast in the shape of slingmud (pelite in suspension) and mud banks. The banks are connected to the coast. They are separated from each other by deeper parts of the shelf: the troughs (Augustinus, 1978).

The average length of mud banks is ca 30 km; the trough behind it is ca 15 km. The mud banks move to the west by erosion at the east side and deposition (growth) at the west side. Differences in the consolidation of the slingmud are an important factor in this process: deposition of slingmud and wave-damping predominate in the west; wave-damping properties are not present in the east. Erosion is the result of the larger wave-energy.

This large wave-energy adduces sand from the sea-floor. This is deposited in the shape of east-west oriented sand bars or cheniers. They form relatively high ridges in the landscape: the compaction of these sand/shell bodies is much less than that of the deposited clay around them.

The cheniers may erode away by later, renewed erosion forces. Alternatively, a mud bank can be deposited in front of the chenier. It becomes part of the landscape then, functioning as a barrier to fresh-water creeks from the south and to salt-water penetration in the wetlands behind the coast. Under such conditions a fresh-water zone relatively near to the coast comes into being and creeks and

rivers are deflected to the west until they can break through the coastal barriers and discharge into the sea.

A relationship exists between the different landscapes and the processes of erosion and deposition. The observed processes can be understood in a system that is valid for the coast of the Guianas. The total cyclus of deposition, erosion, and deposition takes some 30 years, according to Augustinus (1978).

The coast of West Suriname has some characteristics of its own: large chenier complexes occur in the east, but they are rare in the west. This is especially true in the area where Indians built mounds in prehistory (cf. fig. 1; grey areas = cheniers).

THE FIRST INHABITANTS OF THE COASTAL PLAIN OF WEST SURINAME

It is striking that the oldest settlements found up to now are not situated on the cheniers, which are relatively high sandy natural locations for villages: the oldest settlement is an artificially built-up mound situated in the area where no cheniers occur, at least at present. It is found in combination with another one situated on the same creek. Combinations of 2 ca 130 m diameter, 2 m high mounds at a few km apart is typical for West Suriname.

These mounds, Buckleburg-1 and -2 were built up from ca 1700 BP on: the result of dating of wood from the clay layer a few cm above the peat. The built-up clay layers are situated on a subsoil in which peat is a striking stratigraphic unit. This peat grew during fresh-water conditions: such conditions predominated between the Moleson and Comowine depositional phases (Versteeg, 1985).

Peat can only have grown there during periods of limited or no marine influence in this area. This implies that it was situated then at a considerable distance from the sea. Alternatively, cheniers can have protected this area against salt water intrusion.

Clay layers were built up by the Indians to make the Buckleburg sites high and dry locations for villages. (Perhaps part of the present clay layers is natural deposition : see Versteeg, 1985). The circular mound of ca 130 m diameter was built up within 200 years up to a level of 2 m above the surrounding clay surface (fig. 2). Several 'habitation layers (levels with loads of garbage such as potsherds and food-re-mains) are found in the mounds. The characteristic Early

Mabaruma pottery was only found at Buckleburg in Suriname; many such sites (no mounds) are described by Evans & Meggers (1960) from Guyana.

The highest level of the mound was reached ca 1300 BP; precisely the period in which 2 other mounds were built up west of Buckleburg: Hertenrits and Wageningen-1 (fig. 1). The peat under these mounds is dated ca 1300 BP and they are characterized by a different style of pottery: Hertenrits-style. Excavations in the sites of both mound-cultures by the author yielded much information on the subsistence base of both the early and the late group. Subsistence of both groups is based on agriculture at artificially raised square (early, 1700-1000 BP) and rectangular (late 1000-700 BP) plots, on which cassava (*Manihot utilissima*) was cultivated.

Data on Venezuelan maize dispersion suggest that maize (*Zea Mais*) may have played a role in the latest Hertenrits phase, dated ca 1000-700 BP. Such a theory is proposed by Roosevelt (1980), however, no archaeological proof was found up to now in Suriname for such a change of the basic food. Neither is there any evidence for an increase in the population (in surface area of the sites or number of sites in this specific period), such as Roosevelt found in Venezuela in the 'maize-periods'.

Protein was supplied mainly by deer and cayman; fish, manatee, otter, and birds were eaten on a more infrequent base, according to the frequency of the bones found in the midden-layers of both mounds with Hertenrits style pottery (Versteeg, 1985).

A third important area is situated in the west of the area studied here: the Prins Bernhard Polder site (cf. fig. 1) dated in the late Hertenrits period. Thick peat layers are underlying small hills here. A large quantity of specific finds suggests that this site had the function of ceremonial terrain.

The peat datings are particularly interesting here. It was possible to date the top and the bottom of the peat layer. The results suggest that peat grew here for a long period: between ca 1300 and 1000 BP (table 1). These datings form a *terminus post quem* for the use of the terrain by the Indians. The artifacts are found in the clay layer on top of the peat. For all discussed sites holds true that the Indians made use of the rich resources and the fertility that was present during the long fresh-water period in these wetlands. The only reasonable explanation of their mound building activities is the high level of the fresh-water swamp at the end of the rainy season.

PEAT UNDER ARCHAEOLOGICAL SITES

Peat occurs under the discussed archaeological sites. It was growing before the inhabitation by the Indians. This peat is dated from east to west: Buckleburg-1 (1700 BP); Hertenrits and Wageningen-1 (1300 BP); Prins Bernhard Polder (1300-1000). One peat dating is the result of a sample that does not originate from an archaeological site. The sample was collected at Burnside near a small mound, just south of a chenier (cf. fig.1). This peat is ca 2100 years old (see for a discussion of this sample Versteeg, 1985, note 13). When the datings on peat from this part of the West Suriname Coastal Plain are listed, the result is that, over an east-west length of ca 80 km, the easternmost sample is dated at ca 2000 BP, that ca 20 km to the west at ca 1700 BP, that on 20 more km at 1300 BP, and the westernmost sample at ca 1000 BP (cf. table 1). The samples are few, but their reliability is enhanced by the results of datings of the overlying cultural layers which are slightly younger in all 3 archaeological sites.

The present author interprets the dating of the peat-layers as a *terminus ante quem* for the start of the local freshwater predominated conditions. On the basis of the presently available data it is probable that the Moleson depositional phase stopped much earlier in the east of the studied area than in the west.

On the basis of the archaeological data the conclusion is drawn that the fresh-water predominated phase did last at least a few centuries at the location of the 3 clusters of Indian activities: only fresh-water conditions are compatible with a permanent Indian inhabitation and with cassava (or maize ?) cultivation on raised fields.

This implies that the area of Buckleburg was fresh-water dominated from 1700-1300 BP, Wageningen-1/Hertenrits from 1300-1000 BP, and Prins Bernhard Polder from ca 1300-800 BP. Some doubt exists on the kind of human activities at Prins Bernhard Polder because it is not sure this site was used for inhabitation. On the other hand, this site precisely has the thickest peat layer of which the top and bottom section span a few centuries: proof of long-standing fresh-water-conditions.

The archaeological data permit some other interesting conclusions: there most probably is no net coastal accretion in the area of the Buckleburg and Hertenrits/Wageningen-1 sites: it is improbable that the coast was situated south of the present coast line during the prehistoric inhabitation. This situation only can have existed in case of a substantial chenier complex between the sites and the coast.

Such a situation is not probable in this part of the coast where no impressive chenier complexes are found now.

It is highly remarkable that all sites have a peaty subsoil. Peat is not common in this part of the Coastal Plain. The only explanation can be that it is a positive, cultural choice of the Indians, without a relation to the physical properties of peat. The choice for a creek-side location is a more rational one.

INTERPRETATION GEOLOGICAL AND ARCHAEOLOGICAL DATA

The 2 'landscape data' sets demonstrate developments that have a cyclus of millennia (a very large scale) and decennia (small scale), respectively. The archaeological data are related to the fresh-water phase between Moleson and Comowine. The developments that are registered by the archaeological data have one element in common with the geological ones: they demonstrate a cyclus-direction from east to west. The present author interprets the discussed data as striking parallels between the large-scale developments (Wanica depositional phase - non-depositional phase - Moleson depositional phase - non-depositional phase - Comowine depositional phase) and the small-scale cycli.

The developments suggested by the archaeological data occur from east to west in periods of centuries, not decennia such as the recent developments do. The cyclus is part of the large-scale cycli. East-west dynamics are a striking element of the geological developments (large-scale and small-scale) and also of the archaeological developments.

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REFERENCES

AUGUSTINUS, P.G.E.F., 1978. The changing Shoreline of Suriname. Thesis, Utrecht. 232 pp.

AUGUSTINUS, P.G.E.F., HAZELHOFF, L. & KROON, A., 1989. The Chenier Coast of Suriname: Modern and Geological Development.Marine Geology 90: 269-281.

BRINKMAN, R., & PONS, L.J, 1968. A pedo-geomorphological classification and map of the Holocene sediments in the coastal plain of the Guianas. Soil Survey Papers 4. 40 pp.

EVANS, C. & MEGGERS, B.J., 1960. Archaeological Investigations in British Guiana. Bulletin of the Bureau of American Ethnology 177. 418 pp.

RINE, J.M. & GINSBURG, R.N., 1985. Depositional Facies of a Mud Shoreface in Suriname, South America - A Mud Analogue to Sandy, shallow-Marine Deposits. Journal of Sedimentary Petrology 55, 5 :633-652.

ROELEVELD, W. & LOON, A.J. VAN, 1979. The Holocene Development of the Young Coastal Plain of Suriname. Geologie en Mijnbouw 58: 21-28.

ROOSEVELT, A.C., 1980. Parmana, Prehistoric Maize and Manioc Subsistence along the Amazon and Orinoco. New York. 320 pp.

TEUNISSEN, P.A. et AL., 1988. Suriname Planatlas. Washington. 57 pp.

VERSTEEG, A.H., 1985. The Prehistoriy of the Young Coastal Plain of West Suriname. Berichten Rijksdienst Oudheidkundig Bodemonderzoek 35 : 653-750

WONG, TH.E., 1989. Revision of the Stratigraphy of the coastal Plain of Suriname. Publication of the Foundation for Scientific Research in the Caribbean 125. 64 pp.

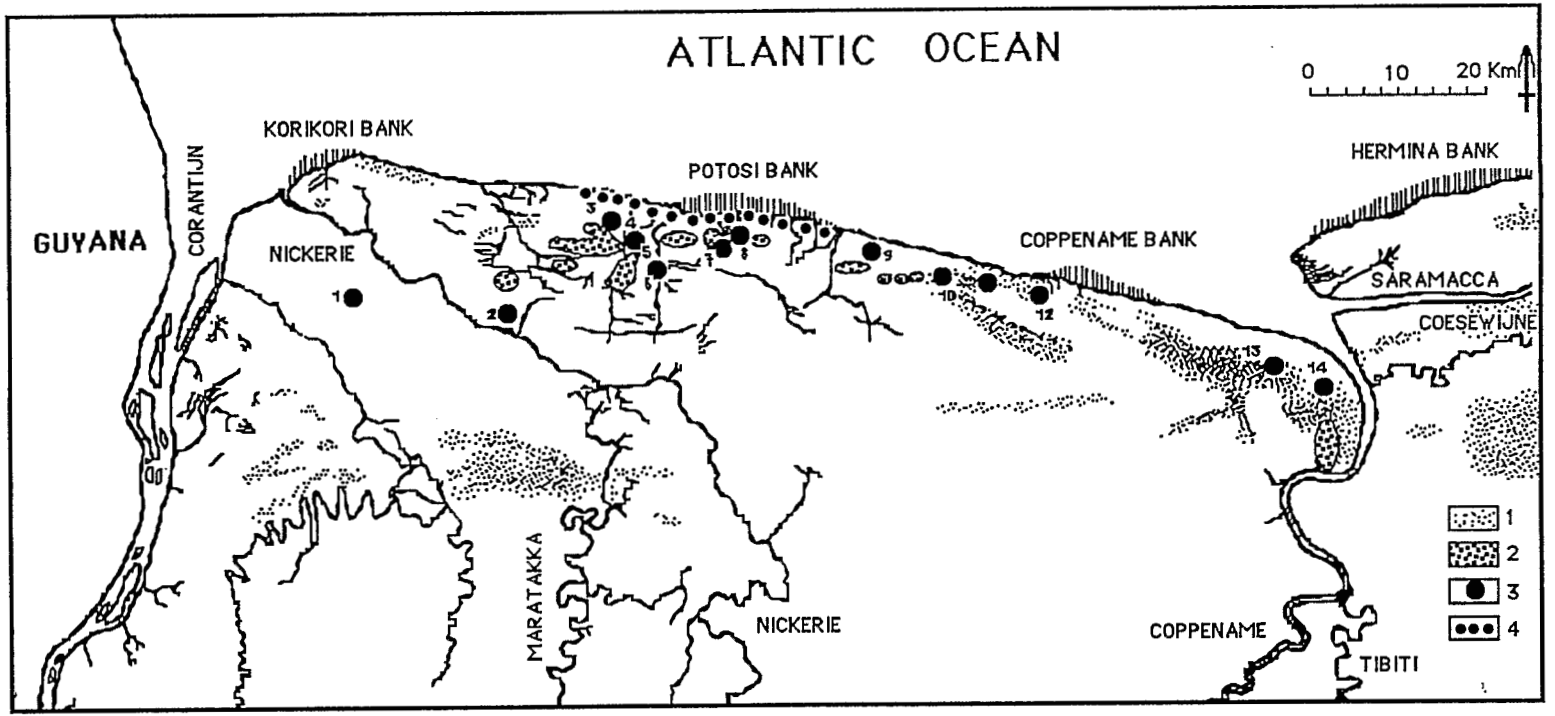

Figure 1

Map of coast of Suriname *Grey areas = shallows*
Archaeological sites: 1 – Prins Bernhard Polder; 4–Hertenrits; 6–Wageningen-1; 7–Brokkeburg-1; 8–Brokkeburg-2; 12–Burnside

Figure 2 *The oldest Indian site in coastal Suriname: The Buckleburg-1 mound.*

Table 1 *Data for fresh-water phases in the coastal part of west Suriname between the Moleson and Comowine depositional phases.*

	East			West
	Burnsi-de area	Buckle-burg area	Hertenr/ Wag-1 area	Prins Bernh. Polder area
peat growing	ca 2100	ca 1700	ca 1300	ca 1300 -1000
fresh-water dominated (peat + in-habitation)	ca 2100	ca 1700 -1300	ca 1300 -1000	ca 1300 -1000