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**Chapter 2**

**Introducing the Trio and their Environment**

I will briefly describe the social and biophysical context of the present case study in this Chapter. As mentioned in the Introduction, the empirical part of my research (Chapters 3 and 4) will focus mainly on a specific Trio village (Amotopo). Chapter 5 will deal with a century of Trio movements in the Surinamese Corentyne basin. The provided social and biophysical data will facilitate contextualization with regard to the subsequent Chapters.

In the first section of this Chapter (2.1), I will introduce the geographical setting of the Trio and the social landscape in which they live. A survey of the various Trio groups and agglomerations in both Suriname and Brazil will be provided. Moreover, the reasons and assumptions for choosing the Trio village of Amotopo, and later the wider Corentyne basin, as a case study for my contemporary archaeological research will be explained.

A presentation of the biophysical context of this specific Trio area is initiated in 2.2. The emphasis will lie on the variety within the ‘interior’ which is normally perceived as one homogenous ‘pristine’ rainforest. In this section the above-mentioned presentation is launched ‘from the ground up’ by briefly discussing the landforms and geology of the area which will be referred to in the ensuing Chapters.

I will move the focus from the land perspective to ‘the land of water’ in 2.3. Over the century the rivers have gained in importance as to the Trio and their movements. The hydrology of the Corentyne basin will be contextualised. Water, however, not only flows through the rivers, it also falls from the sky. The seasons in this region, which are divided into either ‘wet’ or ‘dry’ and have a large impact on the annual rhythms of Trio life. A number of climatological aspects will also be discussed.

The fourth section (2.4), contains a sketch of the vegetation varieties which grow on the land and water inhabited by the Trio.\(^{11}\) Based on the few botanical studies conducted in the interior, an attempt is made to present a number of vegetation types and gradients for the Corentyne basin.

The final section (2.5) consists of a brief summary of the Trio region.

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\(^{11}\) The local fauna, which is of great importance to the Trio, will be introduced in Chapter 4.
2.1 Regions inhabited by the present-day Trio

The Trio form an indigenous conglomerate of subgroups that are unified as a single group who speak the Trio language (see Fig. 2.1). This language belongs to the Cariban language family (Carlin 2004:7). In all things national and international, this group is referred to as ‘Trio’. This term covers the Trio inhabiting the Republic of Suriname and the ‘Tiriyó’ who live in

Fig. 2.1: Sketch of the ethno-linguistic group of the Trio and their neighbours. (adapted from SIL maps for Suriname, Guyana and Guyane, ACT maps and ISA for the locations of Parques Terra Indígenas).
Introducing the Trio and their environment

the Federative Republic of Brazil. When dwelling on Trio land, the Trio refer to themselves as ‘Tarëno’, which literally translates as ‘the people here’ (Carlin 2004:1). In 2007, the Trio villages of Suriname and Brazil counted c. 2,761 inhabitants.

2.1.1 Trio agglomerations and groups

The central research theme of this thesis being the movements of the Trio, we can already split this Trio ‘blob’ on the map into several smaller parts which helps to locate the specific context of the empirical study (see Figs. 2.1 and 2.2). This division is established on the basis of the time it takes to travel from one village to another. Some villages lie in closer proximity to each other than others. In several cases they form clusters between which social connectivity is closer. Peter Rivière adopted this travel-time distribution of villages from Lodewijk Schmidt who was the first to describe the location of multiple Trio villages during the early 1940s.

Back then, the system was set up on the basis of the number of days one had to march to get from one village to another. The largest entity was that of the ‘group’. Between the three groups known at that time you had to march between 3 and 4 days to travel from a village in the one group to the closest village in the other group. Within such a group, a distinction could be made between certain clusters of villages which Rivière referred to as ‘agglomerations’. Villages within the same agglomeration should be

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12 For the sake of clarity I henceforth refer to the Surinamese Trio and the Brazilian Trio by means of the term ‘Trio’. The Trio group as a whole transcends the political boundaries of Suriname and Brazil. However, the political boundaries have created two different spheres of influences which have affected both the Surinamese and the Brazilian Trio in a different manner. Therefore, the term ‘Surinamese Trio’ is applied when referring explicitly to the Trio in Suriname and the term ‘Brazilian Trio’ when referring specifically to the Trio in the Pará state of Brazil.

13 Over the past decade scholars have provided differing demographic numbers for the Trio living in Suriname and Brazil. The majority of these numbers implicitly refer to a definition of ‘Trio’ as people inhabiting a predominantly Trio-speaking village. The total number of Trio provided in the text is combined in the following way. The last count of the number of 1,492 Surinamese Trio in 2007 is provided by Heemskerk and Delvoye. It excludes the Trio living in the village Palumeu and in the capital Paramaribo (Heemskerk & Delvoye 2007:4). Adding Carlin’s count of 150 Trio in the village of Palumeu (Carlin 2004:4) to this number, we arrive at an estimate of 1,642 Surinamese Trio (The Trio in Paramaribo are excluded because almost all of them are visitors who had travelled from other places of residence). Because the Brazilian side also arrives at an estimation for the year 2007, a prognosis is calculated on the basis of a count of 939 inhabitants of Tiriyó villages in 2003. Applying Grupioni’s calculated positive demographic growth rate of 4.5% (Grupioni 2005) we can present a prognosis for 2007 of c. 1,119 inhabitants. Combining the Surinamese and Brazilian data we can assume that there are 2,761 inhabitants in Trio villages anno 2007. Needless to say, this total is much higher than the actual number of native Trio speakers living in these villages. In 2004, Carlin estimated their number to amount to c. 2,000 for both Suriname and Brazil.

14 At that time the majority of the villages were not located along the larger rivers, but on the banks of the small creeks away from the larger rivers (Rivière 1969:37, see also Chapter 5).
able to be reached within a 1-day march. The travelling distance between agglomerations was at the most a 2-day march (Rivière 1969:37).

Once the Trio had adopted dugout canoe technology in c.1950 (Rivière 1969:50), followed by the outboard engine (cf. van Stipriaan 2011:37-9), the forms of travel has increased. Nowadays it is perhaps more fitting to speak of the number of days it takes to travel with a canoe than it does to travel by foot. However, in some instances you still need to walk part of the distance to get from one river to another, or to get around a cataract. Apart from these two modes of travel, a third mode became more and more important: travel by plane. Nevertheless, despite its increasing importance, it does not seem to serve as a reference when discussing the distance from one village to another. With this concept of ‘days travelled’ we can still classify the distribution of the Trio settlements today despite the changed technology which has led to an increase in absolute distances.

Presently, the Trio villages, as in the time of Schmidt, appear to be distributed over three groups separated from each other by more than 2 days of travel by boat. These groups are: (a) the Eastern Trio Group, (b) the recently established Western Trio Group and (c) the large Southern Trio Group found in both Suriname and Brazil. Since all present-day villages are built near the main rivers, I plotted the agglomerations as elongated shapes following the rivers, roughly visualising the Trio landscape (see Fig. 2.2). Due to this orientation, the agglomerations are also named after the

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**Fig. 2.2: The six Trio agglomerations. (The agglomerations are shown in dark grey and the connecting corridors in light grey. Map adapted from The Times Atlas, ACT 2000, Grupioni 2002 and Carlin 2009).**
tributaries or rivers along which they are geographically positioned. Four such agglomerations are located in Suriname and two in the state of Pará in Brazil.

The Southern Trio Group contains one Surinamese and two Brazilian agglomerations. The Surinamese Trio agglomeration within this group is situated in the Sipaliwini. It consists of the villages of Kamani, Kwamalasamutu, Sipaliwini and Alalapadu II, can be considered the most southern Surinamese Trio agglomeration and occupies the Sipaliwini tributary of the Corentyne River. The two agglomerations in Brazil have an east-west separation and are both located in an area that has recently been declared to be protected as Parque Indígena Tumucumaque. The first Tiriyó agglomeration which is positioned in the west of this park can be named the Marapi agglomeration. It includes the villages of Aiki, Kuxare, Urunai and Jawa. To the northeast hereof lies the West-Paru agglomeration with the large village of Missão Tiriyó in the north.

In the Eastern Trio Group we encounter the second Surinamese Trio agglomeration, the Tapanahony agglomeration. It consists of the villages (Përëru) Tëpu, Palumeu and Kasikasima. In Palumeu, the Trio and the Wayana live together. The youngest of the three groups, less than 20 years old, is the Western Trio Group. This group counts two agglomerations identified as the Middle Corentyne agglomeration and the Lower Corentyne agglomeration. The latter includes the villages of Wanapan and Sandlanding, that is situated next to Apura in the north. The Middle Corentyne agglomeration consists of the villages of Lucie, Amotopo, Casuela and Kuruni.

2.1.2 Amotopo and the Corentyne River as case study

The case study I chose is the Trio village of Amotopo, which is located in the mid-west of Suriname on the east bank of the Corentyne River. I feel it is important to render any assumptions transparent before continuing with the further introduction of the biophysical context (sensu David & Kramer 2000:77-9). This also applies to my reasons for choosing a spe-

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15 With the exception of the Western Trio Group, where days of travel could actually be observed, the boundaries of the agglomerations of the two other groups were harder to determine. The agglomerations of the Southern Trio Group were ascribed according to their distribution along separate tributaries. Further research will need to determine whether the boundaries of these agglomerations are correct.

16 A distinction has been made here between two different occupations of the same village area (see Chapter 5). ‘Alalapadu I’ refers to the occupation during the 1960s and ‘Alalapadu II’ to the most recent occupation of this area which began several years ago in 1999 (Heemskerk & Delvoye 2007:32).

17 Grupioni has mentioned another Trio agglomeration or group living further west at the headwaters of the Citaré, a tributary of the East-Paru River (2002, 2005). However, details on the number of villages, their names and the exact locations are lacking.
specific case study as discussed in the Introduction (see 1.3). There are three reasons for my choice to conduct a study among the Trio people, and the Trio village of Amotopo.

The first reason is that links had already been established between the Trio and Leiden University thanks to a decade of research forwarded by the linguist dr. Eithne Carlin in Suriname. Once introduced by her to the Amotopoans, I gained their trust at a much quicker pace than having to do so by myself. The second reason relates to my assumption that the material culture of the Surinamese Trio and the environment they had created was predominantly shaped by the materials extracted from the surrounding forest. Initially my pre-fieldwork focus aimed at the relation between perishable and non-perishable material culture. Therefore, I regarded the Trio to rely on their direct environment as an important prerequisite. This certainly had to be the case for the small community of Amotopo. Members of the family belonging to this community had collaborated with dr. Carlin on her research on Trio grammar more than 10 years ago when they were still living in Kwamalasamutu. Not much later, they had moved northwest in order to found a new community called Amotopo.

A third reason for choosing the Trio was the assumption that their movements must surely be predominantly embedded in a social Amerindian framework. The Trio inhabiting the deep interior had no direct permanent contact with the people living along the coast until Operation Grasshopper commenced in the early 1960s (Rivière 1969:14). This operation involved constructing airstrips in the interior which would improve its accessibility as to future geological investigations (Butner 1961:6-9). It also brought the Trio into contact with missionaries who had utilised these airstrips with governmental permission (Rivière 1969:14-15). From that moment on, the Trio had come into more permanent contact with the people from the coast. However, since the Trio and the people living on the coast are nowadays only connected by means of either river or expensive air travel means that these lines of contact are of little influence when compared with more northerly Surinamese Amerindian villages that are connected by roads.

These second and third reasons for choosing to conduct a study among the Trio, on the one hand, and the community of Amotopo, on the other hand, originated from my initial research focus on ‘perishable’ artefacts. The fragments of material culture that archaeologists encounter during excavations is only a small part of the total inventory of a material culture. An estimated 80-90% of the material culture can be considered ‘perishable’ in the long term and will not be encountered by archaeologists (Drooker 2001:6; Boomert 2000:14). One should think of organic materials such as gourds, calabashes, pigments, wooden artefacts, plaited baskets, feather works, animal skins, and so on. Likewise, in Amotopo, I had expected to
encounter a high number of perishable artefacts and had planned to investigate (a) the ratio between perishable and non-perishable material culture and (b) the production sequences of perishable artefacts.

Dr. Carlin kindly introduced me to Atinio Panekke in Paramaribo. Once he and his father, the captain of Amotopo, had granted permission to conduct research in their village, I was allowed to stay there for a period of 6 weeks. Having left Paramaribo, the Amotopoans accompanied me up the Corentyne River to their village. When visiting the first Trio village upriver (Sandlanding) I observed that the Amotopoans were given perishable artefacts such as plaited cassava squeezers and cassava sifters. When asked why they took these objects with them from this village, they informed me that they themselves did not have the knowledge to make such objects. After a long journey we arrived at the village of Amotopo. Instead of coming across quite a large quantity of perishable material culture consisting of materials extracted from the direct surrounding environment, I observed an abundance of metal pans and plastic cups, plates and pots (see Fig. 3.18). My naïve research expectations were shattered.

Initially I wished to visit other Trio villages, too, but had already promised the Amotopoans to conduct my study in their village. Moreover, a shortage of gasoline occurred in Amotopo preventing further travel to other villages. ‘Forced’ to stay in the village of Amotopo I started to map it in collaboration with Atinio Panekke. After merely focussing on the wooden ‘perishable’ structures, my work soon expanded into mapping the entire village. Having asked Atinio about any ancient Trio stories relating to the construction houses, he answered, ‘We are not like that anymore, we are the new Indians.’ Feeling confused by his remark at first, it became apparent I had to reorient my research focus. During my second fieldwork period, I deliberately chose to return to Amotopo, now with a map of this village in hand.

On this second fieldwork period I took a copy of Peter Rivière’s *Marriage among the Trio* (1969) along with me. This anthropologist had conducted a kinship study in the Trio villages of Palumeu and Alalapadu during the early 1960s. He mentioned the names of the captains of Amotopo and of the nearby village of Lucie in his social inventory that deals with the villages of Alalapadu and Palumeu. The captains showed great interest in all the names Rivière provides. Needless to say, they were familiar with these names and intrigued, too, by the photographs Rivière had taken in their former villages. The Amotopoans expressed the wish to further investigate their social history.

Combining my archaeological interests with the interests of the Amotopoans, I decided to reorient my research from the planned focus on the relation between ‘traditional’ perishables and non-perishables to the focus on the movements of the Amotopoans. The reason being, first and
foremost, to trace the movements of the Amotoapoans and their objects in and out of their village, and secondly to trace their ancestral movements over a period of more than 100 years (1907-2008). This leads us to the headwaters of the Corentyne River. Thus I came to explore my initial confusion with Atinio’s remark (on being the ‘new Indians’) in order to see how the Trio have changed over a century, from an archaeological perspective.

The village of Amotopo constitutes the heart of the empirical part of the present thesis. It is positioned in the Middle Corentyne agglomeration and the upper Surinamese Corentyne area where nowadays the Sipaliwini agglomeration is situated. In the following discussion on the biophysical setting, the Corentyne River will therefore take centre stage in the biophysical description.

2.2 Landforms of the Corentyne River

“The Guiana Shield could be described as a land of old rock, poor soils, much water, extensive forest and few people. These five attributes, perhaps better than any other, lay down a foundation for much of the geographic and historic variation that has shaped the shield, its forests and the way these have and will be conserved and used.” Hammond 2005:1

Let us begin with the biophysical context ‘from the ground up’. As stated in the above quote, the Guiana shield mainly comprises of old rock and poor soils. For the purpose of the present thesis, we will focus on the eastern Guianas through which the Corentyne River flows. This river can roughly be said to transect three macro-landforms presently inhabited by the Trio. From north to south, these macro-landforms are the sediment basin, the Precambrian Rolling Hills and the Guiana uplands (see Fig. 2.3).

![Fig. 2.3: Simplified north-south section of Guiana (adapted from Noordam 1993:15; Krook 1984).]
2.2.1 Sediment Basin

We can observe the Precambrian shield ‘from sufficient altitude as a weath-
ered island surrounded by Tertiary and Quaternary sediments’ (Gibbs &
Barron 1993:3). The accumulation of sediments in the northern part of
the Guianas is referred to as the Guiana Sediment Basin (Groen 1998:130)
or the geological Berbice Province (Gibbs & Barron 1993:16; Snelling
1995:123\(^{18}\)). This sediment basin in turn can be divided into Holocene,
Pleistocene and Pliocene sediments.\(^{19}\)

Moving south from the Atlantic, we first encounter the Young Coastal
Plains as deposited in the Holocene, forming the present-day Atlantic
beaches. Behind these beaches the Old Coastal Plains surface as deposit-
ed during the Pleistocene (Noordam 1993:49). Together they are referred
to by Hammond as the Recent Coastal Plains and can be found from
between 10 m below and 10 m above sea level (Hammond 2005:44-5).
These plains in turn overlie the Pliocene sediment of the Savanna Belt or
Tertiary Sand Plains (or Zanderij Belt, a white sand formation) which sur-
face between 10 m and 50 m above sea level and run parallel to the Coastal
Plains (Noordam 1993:14-5; Hammond 2005:45). In short, this Guiana
Sediment Basin was formed in the Tertiary and Quaternary and can be
found up to 50 km inland (Hoffman 2009:50).

2.2.2 Precambrian Rolling Hills

Beyond these 50 km, between 50 m and 300 m above sea level, we en-
counter the much older Precambrian Rolling Hills (PRH) (Hammond
2005:45-6; Hoffman 2009:51). This typical landform represents an un-
dulating granitoid landscape which was created 2 billion years ago. It is
shaped by means of a process of synclinal folding and differential weather-
ing resulting in the hills, ridges and valleys we observe today (Hammond
2005:45-6; see Fig. 2.4). This land form covers half of the Guiana shield
and stretches from Eastern Colombia to the state of Amapá in Brazil.

In other parts of Suriname broad metamorphic belts of older age are
exposed. The first is a low-to-medium grade metamorphic greenstone belt
which runs from the west to the east along the Guianan coastline and

\(^{18}\) Here Snelling’s correction of Gibbs & Barron’s geological Berbice-Boa Vista province is
preferred.

\(^{19}\) For the sake of comprehension I equate the similar concepts of Noordam’s ‘geographical
zone’ with Hammond’s ‘land form’. Noordam defines a ‘geographical zone’ as ‘a typical com-
bination of landscapes, soils and hydrological conditions’ (Noordam 1993:13). Hammond
defines a ‘land form’ as a sub-region that acquires significance by its topographical, geo-
logical-historical, hydrological and soil characteristics in which elevation, as a principal factor,
binds these characteristics for the Precambrian (Hammond 2005: 44). It is not my goal here
to exhaustively introduce the local geology. However, discussion on ‘land forms’ facilitates
the introduction of several unique geological characteristics.
Amotopoan Trails

has an age of c. 2.18 - 2.13 billion years or Ga (Delor et al. 2003:213; Kroonenberg & de Roever 2010:14). The most northern Trio village (Sandlanding) is positioned on this greenstone belt albeit covered with tertiary and pleistocene sediments. A younger granitic suite (2.11 - 2.08 Ga) with a northwest-southeast orientation (Delor, et al. 2003:216) covers a huge part of the eastern interior of Suriname extending into the western and southern interior of French Guiana. The Eastern Trio Group seems to be entirely positioned on this suite.

Moving from the north to the east, we now return to the west of Suriname. The above-mentioned greenstone belt in the northern Suriname is, in turn, intersected by a younger high-grade metamorphic band which was formally referred to as the Central Guiana Granulite belt. This belt was once considered to extend from west Suriname towards southern Guyana and into Brazil. Due to fresh evidence it is now thought to divide them in two (Delor, et al. 2003:218; Kroonenberg & de Roever 2010:14; cf. de Vletter et al. 1998:34,38). The older part consists of the Falawatra Group (2.07 - 2.05 Ga). It has a southwest-northeast orientation and extends into the Bakhuis Horst in the northeast. The younger part, which some scholars now consider to be the new Central Guiana Granulite belt, is formed by the gneisses of the Surinamese Coeroeni Group in the southeast of the Corentyne basin and the Kanuku complex in Southern Guyana (2.05 - 1.81 Ga) (Delor, et al. 2003:218; Kroonenberg & de Roever 2010:14). The Trio living in the Middle Corentyne agglomeration are positioned on the north-eastern part of this new Central Guiana Granulite Belt.

These above-mentioned groups and belts are surrounded and covered by eroded low grade ‘acid to intermediate metavolcanics’, generally referred to as the Uatumá suite dated 2.01-1.96 billion Ga (Delor et al. 2003:218; cf. Kroonenberg & de Roever 2010:15). The Trio village of Wanapan in the lower Corentyne River, for instance, is positioned on this suite, as is the larger Trio village of Kwamalasamutu in the deep south. The final geological features to be mentioned here are the youngest smaller magmatic intrusions of the Precambrian rock. The dolerite dykes, as they are called, came into existence by intruding through the fissures of the older rock (see Fig. 2.3). They now appear on the geological map as elongated ‘stripes’. These dykes are of various more recent times: 1.8 Ga for Avanavero sills and dykes and 1.5 Ga for Kayzer dolerites (Delor, et al. 2003:219-220; Kroonenberg & de Roever 2010:20-1). These dates also imply that weathering and erosion has had relatively less impact on them than it has had on the older geological matrix they have penetrated.
2.2.3 Guiana Uplands

Higher than 300 m above sea level up to 1500 m we encounter the Guiana Uplands, which Hammond considers the second most important landform. Discussing the Guiana Shield as a whole, he juxtaposes the Guiana Uplands with the Guiana Highlands (1500 - 3000 m) which are only found in the Western Guiana Shield. In the Eastern Guiana Shield (between 300 m and 800 m above sea level), all hills and mountains are of

Fig. 2.4: The development of erosion and weathering of the undulating granitoid landscape (Kroonenberg & Melitz 1983:398), reprinted with permission of the first author.
a non-sedimentary origin. Due to localized differential weathering of the country rock granites, granulites and dolerites became exposed, taking on the appearance of isolated massifs and ridges (Hammond 2005:47). Above 800 m, Hammond continues, the variety of geological structures include granitic intrusives, granulitic horsts as seen at the Bakhuis and Wilhelmina Mountains (the higher elevations of the granulite belt) and ancient metamorphosed volcanics of the Uatumá suite. Most hills and mountains above 1500 m, all to be found in the Western Guiana Shield, are sedimentary in origin and comprise the tablelands also referred to as tepuis or tafelbergs (Hammond 2005:46). In Suriname there is only one tepui outlier. It is called the ‘Tafelberg’ and has a relatively modest elevation of 1026 m.

The geological Tumuc-Humac complex is a belt of strongly sheared high grade rocks characterised by dome-shaped granite hills (also referred to as inselbergs). This complex houses a series of highland massifs that run perpendicular to the Central Guiana Granulite Belt (Gibbs & Barron 1993:44; Hammond 2005:38). The Acarai mountain chain (1009 m) divides the Amazon and the Guiana river basins in the southwest of Suriname and the south of Guyana (Roraima province). The Tumuc-Humac mountain chain (maximum elevation 701 m) does this in the south-east. This 120 km stretch forms the border dividing the mid-south of Suriname and southern French Guiana on the one side, and the state of Pará and Amapá in Brazil on the other. From the Tumuc-Humac Mountains towards the main Amazon River the landscape drops in elevation and is mainly shaped by the lower lying metamorphosed volcanics of the Uatumá Supergroup and weathered granitoid rocks that Gibbs and Barron summarized together as the geological Uatumá-and-Roraima province (Gibbs & Barron 1993:17).

2.3 On hydrology and climate

In order to move our contextual discussion from the ground to the forest, we first need to discuss the local hydrology. The contemporary Trio live on the broad stretches of the rivers. Nowadays these rivers should be considered highways which determine a great deal of their everyday lives. ‘Water’ also determines their existence in terms of climate. The seasons, roughly divided between ‘wet’ and ‘dry’, dictate their annual rhythms. The subsequent discussion is mainly steered towards contextualizing the Trio on the Surinamese Corentyne basin.
2.3.1 Hydrological context of the Corentyne River

Suriname and Guyana together house a vast drainage area of the Corentyne River that forms their mutual boundary.\textsuperscript{20} This river originates in the Acarai Mountains near the border with Brazil and in the Surinamese Central Highlands where it subsequently drains basins in both Guyana and Suriname together covering an area of 67,600 km\textsuperscript{2} (Amatali 1993:45). The Corentyne River can be divided into an Upper, a Middle and a Lower part. When referring to the Upper Corentyne River, under which both the New River and the Kuruni tributaries are subsumed, the main reference in my thesis will concern the Kuruni and its tributaries, the Kutari and the Sipaliwini, or in other words the Surinamese Upper Corentyne River. A distinction between the Middle and the Lower parts of the river can be made on the basis of tidal influence which for the Corentyne River specifically reaches up to Cow Falls. These falls are situated c. 210 km inland, measured along the stretch of the river from the outfall (HRD 1969 in Amatali 1993:45; as the 'macaw' flies 125 km inland).

The other large river of Suriname to the east, the Maroni River\textsuperscript{21}, forms the boundary between Suriname and French Guiana. It drains a slightly larger area than the Corentyne River, namely 68,700 km\textsuperscript{2} (Amatali 1993:49). Its western tributary, the Tapanahony, is home to the Eastern Trio Group. The main river west of the Corentyne River, which also reaches far into the interior, is the Essequibo. It is Guyana’s largest river and has a much larger drainage area totalling 157,500 km\textsuperscript{2}, 25\% (39,000 km\textsuperscript{2}) of which lies on Venezuelan territory (Hammond 2005:136). The Essequibo, the Corentyne and the Maroni Rivers form the few larger river systems in northeastern South America that are not in direct contact with the Amazonian river system (see also ter Steege et al. 2000:33).

South of the Corentyne River, we encounter the basins of the Brazilian tributaries feeding the main Amazon River, the headwater of which are home to the Brazilian Trio of the Southern Trio Group. Directly south we encounter the Trombetas tributary which is as large as the Corentyne and Maroni drainage surfaces together, namely, 136,400 km\textsuperscript{2}. The Trombetas basin encompasses the confluence of three tributaries. Together they are

\textsuperscript{20} The Dutch term for the river is ‘Corantijn’. Surinamese and Dutch scholars therefore refer to this river as the ‘Corantijn’ in publications written in English (e.g. Versteeg 2003). Dutch, English and Guyanese speaking scholars refer to the river as ‘Corentyin’ or ‘Corentyne River’ (e.g. Kloos 1971, Williams 2003) or the nowadays less fashionable ‘Courentyne’ or ‘Courantyne River’ (e.g. Rivière 1969; Hammond 2005). I have opted here for ‘Corentyne’ as the river is known internationally. The Trio are said to refer to the Corentyne with the names ‘Kuritono’ and ‘Siipuu’ (Boven 2001:13). The latter is said to refer to the New River (ACT 2000).

\textsuperscript{21} ‘Marowijne’ is the Surinamese and Dutch name for the river that French and English speaking scholars call ‘Maroni’. In several Amerindian languages the river is referred to as the ‘Marowini’ (pers. comm. Carlin 2011).
largely responsible for the drainage of the northern state of Pará: the eponymous Trombetas (the largest contributor) drains an area of 73,400 km², the Mapuera 26,500 km² and the West-Paru 36,500 km². Moving towards the east from the Trombetas basin, we encounter two smaller basins, namely the basin of the East-Paru tributary with a drainage area of 44,250 km² and basin of the Jari tributary with a draining an area of 54,600 km² (Hammond 2005:136).

2.3.2 Trio land and its shifting climate boundaries

A northeasterly and southeasterly trade wind, referred to as the Inter-Tropical Convergence (ITC-zone), is mainly responsible for the climate in this region, resulting in rainfall seasonality. For Suriname it is usually described as follows. The trade winds pass this region in the north twice a year resulting in: (a) a short season (early December to early February), (b) a long, rainy season (late April to mid-August), (c) a short season (early February to late April) and (d) a long, dry season (mid-August to early December). The Surinamese climate is therefore usually defined as humid-tropical (Af) in the Köppen scheme (Amatali 1993:32).

As to the interior of Suriname further differentiation can be presented. The average rainfall above the Corentyne River is c. 2000 mm per annum and thus less than, for instance, rainfall in the northeast (Amatali 1993:33; Teunissen et al. 2003:vi). Teunissen et al. therefore speak of a different climate regarding the Trio area. In their view, this region (referring to the area of the Southern Trio Group), has a tropical wet and a dry climate (Aw) with only one rainy and one dry season. The rainy season starts in January and ends in July-August while the dry season covers the remaining months. Unfortunately, no reference is made as to how they arrived at this differing climate zone.

This differentiation can be further explored by adopting a somewhat wider regional perspective. Two independent research groups have recently published updated world maps with Köppen classifications. These results can be applied in order to visualize climate boundaries within the Trio region. One classification has been provided by a research team from Vienna (Kottek et al. 2006) and another by a Melbourne team (Peel et al. 2007). Kottek et al. applied data acquired between 1951 and 2000, whereas Peel et al. seem to have applied only recent data provided by national stations on a sub-grid level. The differences are: (a) Kottek et al. show a region with a humid-tropical climate zone (Af) in the north and a tropical monsoon climate in the south while (b) Peel et al. move this division further

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22 This section starts with the climate assertions done for the Surinamese region only since the largest part of the Corentyne River discussed in the present thesis falls within Surinamese borders.
Introducing the Trio and their environment

north, add a large Aw climate zone to the southwest and encapsulate the Middle Corentyne and the Sipaliwini agglomerations (see Fig 2.5; see also Hoffman 2009:49-50).

In order to envision any climate time depth for the Corentyne basin specifically, we must briefly revert to older raw data presented by three weather stations situated along the river (see Fig. 2.6; adapted from Nurmohamed 2008:67-8). The first weather station was located in Nieuw-Nickerie at the mouth of the river (Lower Corentyne). The data were collected here between 1960 and 1969. The second weather station was positioned in Kuruni (Middle Corentyne) where data were collected between 1971 and 1986. The third weather station was located at the river’s headwaters in the village Sipaliwini where data were collected between 1971 and 1985 (Upper Corentyne). The early termination of data provision by the weather stations of the interior seems to have been due to turmoil caused by the civil war (1986-1992). The averaged results show that for the period 1971-1985 all three Corentyne weather stations indicated a zone with a Tropical Monsoon Climate (Am). 23

23 A Tropical Monsoon Climate classification is given to a climate that contains a driest month with less than 60 mm, but more than (100-[total annual precipitation [mm]/25]) (McKnight & Hess 2000:208). Nieuw-Nickerie had a driest month of 51 mm, which is higher than the annual equation, resulting in 30.08. Kuruni had a driest month, namely October, of 46 mm precipitation. This is higher than the annual equation and results in 18.68. Finally Sipaliwini, too, with a driest month of 46 mm is higher than its annual equation resulting in 19.64. It is therefore also to be defined as falling within the Köppen-Geiger classification of the Tropical Monsoon Climate.

Fig. 2.5: Köppen-Geiger Climate Classification for the Eastern Guiana Shield (L: 1951-2000 Adapted from Kottek et al. 2006, R: 2007 adapted from Peel et al. 2007).
In sum, Peel et al. provide us with the most recent data confirming Teunissen et al.’s aforementioned climate ascription for the Trio area (see also Hoffman 2009:49-50). It seems to show that, over the past 20 years, the Am climate has expanded to the north in Suriname and the Aw climate zone has entered the country into the southwest. This could explain my observations in the field.

2.4 Forests of the Guiana peneplain

After discussing the earth and water, it is now time to deal with the vegetation. As stated earlier, the forests have long been deemed internally consistent by presuming they all constituted a single ‘pristine’ rainforest. There is a consensus nowadays among scholars to move away from this notion of the homogenous primordial rainforest (e.g. Balée 1994; Erickson 2008; Alexiades 2009). This section attempts to show the diversity of the rainforest for this region as far as the literature on botany permits. The

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24 Reasoning from the old rainfall seasonality scheme, I had hoped to experience the short dry period and the long rainy season. Nevertheless both my fieldwork periods took place during one and the same rainy season.
Introducing the Trio and their environment

Vegetation types covering the abovementioned landforms of the Guianas have been described by ter Steege and Zondervan. They provide a helpful division of the Guiana forests into several major regions (see Fig. 2.7; ter Steege & Zondervan 2000:38-54).

The contemporary Trio area presently overlaps three of these major forest regions to which the non-forest region of the Sipaliwini savanna can be added. Since the emergence of the Western Trio Group, the Trio who have moved furthest north (see Fig. 2.2) have recently entered two new

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**Fig. 2.7: Map of the major forest and savanna regions in the Guianas (adapted from ter Steege & Zondervan 2000:39).**
forest regions. The northern Trio agglomeration of the lower Corentyne River now finds itself surrounded by forests of the tertiary sand plains (the village of Wanapan) and the forests of the coastal plains (the village of Sandlanding). Since the focus of my thesis is mainly on the contemporary Trio agglomeration of the middle Corentyne River and the former area of its inhabitants located further south, I have chosen to limit the present context to the most relevant major forest region, i.e. the Guiana peneplain. For more information on the vegetation of the Sipaliwini savanna the reader is referred to the works of Oldenburger and Norde (Oldenburger et al. 1973; Norde et al. [1975] 2009).

The forest region of the Guiana peneplain can be found to the south of the sand forests and consists of forests found on the Precambrian shield and its transecting rivers (see 2.2). The term ‘pristine’ rainforest is frequently applied to this region. However, more diversity is found under this green blanket. In general, the forest region of the Guiana peneplain differentiates itself from the forests in the sediment basin to the north by a higher tree diversity (ter Steege & Zondervan 2000:51). In addition, we find that an increasing gradient runs from the west of Suriname to the east, resulting in a higher tree diversity for the headwaters of the Maroni River compared to those of the Corentyne River (Stropp et al. 2009:50; van Andel et al. 2009:16). Due to the remote access of the forests of the Guiana peneplain, systematic botanical research on the Guyanese and Surinamese forests is sparse when compared with the coastal area, especially, it seems, for forests along the Corentyne River (ter Steege & Zondervan 2000:51; van Andel et al. 2009:8-9; Haripersaud 2009:18). We will now focus on the forests of the Guiana peneplain up to 500 m above sea level which can be divided into the upland floodplain forests and the upland dry forests.

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25 This interesting phenomenon (i.e., a group of people moving into new forest environments), has to be set aside for further future research. For more information on the highly varied forest regions of the tertiary sand plains and the forests of the coastal plains, see ter Steege and Zondervan (2000:39-49).

26 Ter Steege and Hammond state that this difference in diversity between the major forest regions should not be ascribed to a latitudinal difference which is normally associated with the gradient more to the south from the tropics to moderate areas present between 60° and 20° Latitude (ter Steege & Hammond 2000:113).

27 The same applies to the Brazilian forests on the Guiana peneplain. In the north-western mountainous part of the Brazilian state Pará specifically ethnobotanical research has been conducted by Velozo, Doi and others (Velozo et al. 1975 and Doi et al. 1975 in ter Steege & Zondervan 2000). However, since more detailed studies of the lowland forests located to the south of this region are lacking, knowledge that does exist of these Brazilian forests seems predominantly Guyanese/Surinamese projection (see ter Steege & Zondervan 2000:53).

28 For more introductory information and references on the forests of the Guiana peneplain 500 m above sea level, see Teunissen et al. 2003:28-9; van Andel et al. 2009:15-6.
2.4.1 Upland floodplain forests

Starting with the Corentyne River again, we will firstly focus on the forests of her banks. Upland floodplain forests can be characterized as being either permanently flooded or seasonally flooded (Hoffman 2009:55). The former is in general characterized by swamp forests with a low degree of tree diversity. Hoffman confirms that the floodplain forests of the Guianas often do not correspond well with the Brazilian seasonally flooded ‘varzéa’ forests. The reason for this is that the rivers of the Guianas flowing north into the Atlantic are much smaller than that of the Amazon (Hoffman 2009:57 in reference to Pires & Prance 1985; Prance & Brown Jr. 1987).

Hoffman researched hectare plots both in central Suriname (near the Saramaccan village of Stonhuku) and in southern Suriname (near the Trio village of Kwamalasamutu). The main difference he came across between these two locations seems to be a higher density of smaller trees characterizing the floodplain forests of Southern Suriname of which Inga spp. (TR: Karau [Hoffman 2009:306]), Quararibea guianensis (T: Paaraimë [Hoffman 2009:309]) and Sagotia racemosa (T: Akohka [Hoffman 2009:314]) seem to be the most characteristic.29 Hoffman describes that the seasonally flooded forests of the latter are characterized by tall, 40 m high trees, which are positioned on a flat slope and have a relatively open understory (cf. van Andel 2009:13-14). In further reference to his thesis (Hoffman 2009:57), it seems that species of the pea family (Caesalpinioideae Fabaceae) dominate the southern flooded forests, in particular the species Eperua falcata (T: Totopo [Teunissen et al. 2003]). Other encountered flood-tolerant genera in the pea family include Crudia (T: Wapa [Hoffman 2009:305]) and Elizabetha (TR: Kakaimë [Hoffman 2009:316]). A large abundance of species from the palm family was found in the flooded forest, too, especially Astrocaryum sciophilum (T: Murumuru [Hoffman 2009:321]).

In addition, I can add some differences which the Amotopoans perceived as to the Corentyne River. In reference to graphs from Andel’s fieldguide they remarked that the species of Mauritia flexuosa (T: Koi) and Desmoncus polyacanthos (T: jamalaimë) can be found downstream. In reference to the graph of the species Mora excelsa (T: Mora [Hoffman 2009:54]), they mentioned that this species was present in high quantities in the area surrounding the Trio village of Wanapan and that its wood is utilised in Apura to carve canoes (cf. van Andel 2001:II:170-171). Moreover, they stated that Murumuru (L: Astrocaryum sciophilum) was not present in the vicinity of Amotopo.

29 All Trio plant names and their Latin references are taken from either Hoffman’s thesis (Hoffman 2009), Teunissen et al. field report (Teunissen et al. 2003) or my own fieldwork in reference to van Andel’s field guide (van Andel 2000).
2.4.2 Upland dry forests

In Suriname the forest type of the upland dry forests is referred to as ‘lowland high dry land forest’ (Teunissen et al. 2003:29), while in Guyana one refers to this type as ‘mixed’ forest (van Andel 2000:I:46-7; Hoffman 2009:55). In contrast to the Brazilian ‘varzá’-Guiana floodplain forest incongruence, this ‘non-flooded’ forest type of the inter-fluvial area, however, does seem to correspond with the Brazilian category of *terra firme* (Hoffman 2009:55 referring to Pires & Prance 1985; Prance & Brown Jr. 1987). The canopies of the dry forests grow up to 30-40 m high with some exceptions measuring up to 50 m (van Andel 2009:12; cf. Hoffman 2009:56, who states that canopies of the dry forest for his specific cases further south reach heights of 25-30 m).

In their Guyana case study, ter Steege & Hammond (2000; see also 2001) make a distinction between the species-poor forests in central Guyana and the species-rich forests in Southern Guyana. Non-flooded forests of central Guyana are associated with high average seed weight and rodent, gravity and water dispersal. These are characterised by a high presence of *Lecythidaceae* (a.o. *Bertholletia excelsa* or Brazil nut) and *Chrysobalanaceae* (ter Steege & Hammond 2000:113). Due to competition slow-growth genera, specifically adapted to low-light conditions, persist while lighter species are slowly muscled out. Ter Steege and Hammond believe this competition ultimately results in a superior adaptation of these slow-growing trees leading to their mono-dominance due to their self-replacing dispersal. In their view, these forests indicate a low disturbance rate. In addition, they mention the little evidence of pre-Columbian occupation as known from archaeology (ter Steege & Hammond 2000:114; cf. van Andel 2000:I:48).

In contrast, the forests of southern Guyana demonstrate a high species variety. The majority is in general characterized by small seeds that are associated with bird and primate dispersal. The genera of this region have a low wood density which is typical for pioneer vegetation. The increase in the variety of species from the non-flooded forests of the central area towards those of the south has also been corroborated for Suriname (Hoffman 2009:54-5). Ter Steege and Hammond go on to state that, in contrast to Central Guyana, the southern region was allegedly densely occupied by Amerindians during the pre-Columbian period (ter Steege & Hammond 2000:114 referring to Evans & Meggers 1960 and Dubelaar 1986). Albeit that, at first sight, this also might be a valid hypothesis for Suriname, further archaeological surveys into the uninhabited central area must take place before this correlation can be confirmed (see also 2.4.3).

In sum, the dry forests of the Guiana peneplain in Guyana and Suriname seem characterized by a north-south gradient. The dry forests in the central area, as described by ter Steege and Hammond, are chara-
terized by the minimally disturbed slow-growing genera. These trees are characterized by large seeds, dense wood and self-replacing dispersal. The dry land forests further south represents a composition of a high variety of pioneering species characterized by bird and primate dispersal of small seeds and a low wood density (ter Steege & Hammond 2000).

2.4.3 Forest ‘Islands’

Mono-dominance of certain species in smaller bounded areas may have various causes. An assumption that ter Steege and Hammond seem to question is the notion that there is only a single climax vegetation type in the dry forests and that all vegetation ultimately regenerates into the same climax vegetation at this latitude (ter Steege & Hammond 2000:101-2, 113-4). Specific vegetation assemblies have come into existence as a result of their specific geographical position and the specific climate, but also by way of their specific historical contingencies. Examples ter Steege and Hammond present are: shifting cultivation, fires, floods, landslides and phytopathogen epidemics. One of these phenomena, or certain combinations thereof, can result in a specific situation in which certain species converge into a characteristic assemblage (ter Steege & Hammond 2000:101). I will now provide several examples of forest islands present in the dry forests.

A first specific forest type is formed as a reaction to a specific local geological feature, the dolerite dykes that penetrate the Precambrian shield (ter Steege & Zondervan 2000:48; see also 2.2). The lateritic soils, or leptosols on top of these dykes can vary in height (some even between 100 m and 400 m) and have a rocky, gravelly to clayey constitution. Due to this constitution the soils have a low water retention capacity which results in a low, shrubby forest. The trees found extensively on these soils in Guyana are the endemic *Vouacapoua macropetala* and in Suriname the *Vouacapouya Americana* (T: *Wakapu* [Hoffman 2009:325]). Next to the specific shrubs and trees, the landslides along the ridges of the dykes also contribute to the formation of a second type of forest island. Liana forests have been reported to thrive on the landslides occurring on the steep slopes of the dykes (ter Steege & Zondervan 2000:49). Liana forests, however, are also described to emerge potentially as a result of long-lasting floods, storms or fires (Teunissen *et al.* 2003:34; van Andel 2009:14 in reference to ter Steege *et al.* 2007).

30 In a recent study, reflecting on Central Guyana, Hammond *et al.* describe the remarkable association between the distribution of prehistoric archaeological sites on riverbank levees near exposed dolerite dykes (Hammond *et al.* 2007:158).
A third type of forest island is formed by large frequencies of Brasil nuts (L: *Bertholletia excelsa*, T: *Tuhka* [Hoffman 2009:109]). According to Teunissen *et al.* the forest islands of Suriname are exclusively found in the Corentyne basin (Teunissen *et al.* 2003:32). On the one hand, this forest island type would fit in the dry forests (previously described by ter Steege and Zondervan) in the least disturbed central area. On the other hand, this characteristic forest island seems to occur from north to south along the Corentyne River. They have been reported near one of its sources (near the Sipaliwini Savanna), near the Trio village of Alalapadu II, near the Trio villages of Kuruni and Casuela in the middle Corentyne area and down to the Kaburi creek near Apura (Teunissen *et al.* 2003:32-33, in reference to van Troon 1985). Some of these Brazil nut forests are known to have existed for centuries and, likewise, their widely appreciated nuts seems to have attracted the Trio and others probably over long periods of time (Chapter 4 and 5; see also de Jong 2007:67; Bubberman 1972:184; Barrington Brown 1877:348-351). Recently it has been suggested that these Brazil nut islands not only attract people. Indeed, the relative rapid spread of this slow-growing species might even have to be explained by a history of Amerindian movements (Shepard & Ramirez 2011; cf. Politis 2006).

The final type of forest island mentioned here is more directly associated with abandoned Amerindian villages and gardens. According to the archaeologist Versteeg, these former villages (some allegedly more than 1000 years old) seem to be permanently characterized by species such as bamboo (T: *Kwama*; L: *Guadua* sp. or *Bambusa vulgaris*), cedar (T: *Simajae*; L: *Cedrela odorata* [Hoffman 2009:309]), the red locus (TR: *Kauru*; L: *Hymenea Courbaril* [Hoffman 2009:328]) and the cotton tree (TR: *Kumaka*; L: *Ceiba pentandra* [Hoffman 2009:309]) (Versteeg 2003:38). These bamboo forests are in general apparently found in the western part of Suriname (Teunissen *et al.* 2003:34; cf. discussion of secondary forests in Hoffman 2009:56-7; van Andel *et al.* 2009:14). Fortunately, the composition of certain species in former gardens and villages contrasts with their environment, facilitating archaeological surveys that would normally be an extremely difficult task to undertake due to the dense vegetation.

### 2.5 Summary of the Trio groups and their environment

Although the largest part of this chapter has focused specifically on the Corentyne River basin of Suriname, I will conclude with a short summary of the ‘reported’ settings for the three Trio groups.

The villages of the Eastern Trio Group are situated on the Palumeu and Tapanahony tributaries of the Maroni River and house c. 25% of the total Trio population. The Trio members of this group live within close range of
the neighbouring Wayana (see Boven 2006; Duin 2009) and cohabit with
the Wayana in some of the villages (particularly the village of Palumeu).
The region of the Eastern Trio Group is subject to the Tropical Monsoon
climate and is positioned on a different geological granite layer than that
of the other Trio Groups.  

The Southern Trio Group is the largest in terms of inhabitants and
houses more than half of all the Trio. The villages of the Southern Trio
Group are positioned at the headwaters of the incipient tributaries of
the larger Corentyne and Paru Rivers. The group transcends a political
boundary uniting the Surinamese and Brazilian Trio.  When visiting their
Brazilian relatives, the Surinamese Trio have to march for a day to cross
the divide. An important notion is the fact that the vegetation in some of
its parts is much different from that of the other two groups. Next to in-
habitating the dry and floodplain forests, the Southern Trio also experience
the mountainous Tumuc-Humac and the savanna landscape which accom-
panies the borderland. Within the area of the Southern Trio Group, the
people most probably experience a transition from a Wet and Dry Tropical
climate (Aw) in the west to a Tropical Monsoon climate (Am) in the east.

The Western Trio Group houses less than 25% of the Trio and is there-
fore the smallest in terms of population and the youngest of the three
groups. This group is situated on the broad stretch of the Corentyne River.
This location increases their opportunities to travel, too, since the broad
waters, especially in the rainy season, enable a relatively fast way of trav-
eling on the river when compared with the other regions. This fact is
also reflected in this Group’s elongated settlement distribution within the
landscape. In terms of vegetation, they come across floodplain forests, dry
forests and their forest islands. The northern part of the group extends
towards the mouth of the Corentyne River where they find themselves sur-
rrounded by forests characteristic of the sediment basin. The group extends
from an Aw climate in the south to an Am climate in the north ending up
very near to the Af climate zone.

In the following Chapter the focus will be entirely on the Trio village
of Amotopo located in the middle Corentyne agglomeration which is po-
sitioned in the Western Trio Group.

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31 For further information on the Eastern Trio group see the publications by the anthropolo-
gists Vanessa Grotti and Marc Brightman (Grotti 2007; Brightman 2007). For more specific
information on its surrounding forests see van Andel et al. (2009).
32 For more information on the Brazilian side of the Southern Trio Group, see the publications
by the anthropologist Denise Fajardo Grupioni (Grupioni 2002; 2009).