THE AMAZON CONSERVATION TEAM SURINAME

TRIO BASELINE STUDY

A sustainable livelihoods perspective on the Trio Indigenous Peoples of South Suriname

December 31, 2007

TRIO BASELINE STUDY

A sustainable livelihoods perspective on the Trio Indigenous Peoples of South Suriname

Final report
Paramaribo, 31 December 2007

By:
Marieke Heemskerk and Katia Delvoye, with the Trio communities

ACKNOWLEDGEMENTS

The present study was commissioned by the Trio and Wayana Indigenous Organization TALAWA and the Amazon Conservation Team (ACT) Suriname.

We wish to thank numerous Trio villagers, traditional authorities, government officials, health workers, and members of Non-Governmental Organizations in Suriname for their time, insights, and information. A special word of thank is reserved for the community members of Wanapan, Sandlanding, Amotopo, Kuruni, Lucie, Kwamalasamutu, Sipaliwini, Alalapadu, and Tëpu for their hospitality and participation in the research. In particular we would like to thank our Trio surveyors for their excellent work and persistence in obtaining answers to often arduous questions: Cornelis, Marcel, and Tikinor from Tëpu; and Brian, Feikje, Seini, André, Jason in Kwamalasamutu. Many other Trios from the smaller places helped out as guides and translators in their respective home villages.

We are grateful to BHP Billiton Maatschappij Suriname (BMS) for providing TALAWA with the funds to command this study, and to the Organization of American States (OAS) for providing complementary funding to ACT.

Our gratitude also goes to the staff members of the ACT-Suriname for their help with logistics and information that helped understand the problems and development priorities of Trio families. TALAWA members and affiliates helped with travel arrangements, proper introductions to the communities, and information about the various villages and settlements that were visited. Thank you all!

Opinions expressed in this report are those of the author and do not necessarily reflect the views of ACT Suriname or other institutions the authors are affiliated with. The authors are responsible for all errors in translation and interpretation.

Marieke Heemskerk, Katia Delvoye, and the Trio communities

Paramaribo, Suriname
December 31st, 2007

LIST OF ABBREVIATIONS

ABS	General Bureau of Statistics (Algemeen Bureau Statistiek)
ACT	Amazon Conservation Team
ADEK	Anton de Kom University
AIDS	Acquired Immune Deficiency Syndrome
AOV	General Old-Age Services (Algemene Ouderdoms Voorziening)
CBL	Central Bureau Aerial Mapping (Centraal Bureau Luchtkartering)
CDFS	Community Development Fund Suriname
CI	Conservation international
CITES	Convention on International Trade in Endangered Species
DFID	Department For International Development
EBS	Energie Bedrijven Suriname
EES	Ethno-Ecological Study
FOB	Fonds Ontwikkeling Binnenland
GIAHS	Globally Important Ingenious Agricultural Heritage System
HIV	Human Immunodeficiency Virus
KITLV	Royal Institute for the Study of Language, Countries, and Peoples (Koninklijk Instituut voor Taal-, Land- en Volkenkunde)
LVT	Service for Aviation Grounds (Dienst Luchtvaartterreinen)
METS	Movement for Eco-Tourism in Suriname
MZ	Medical Mission primary Health Care Suriname
NARENA	National Resources and Environmental Assessment
NGO	Non Governmental Organization
NSI	North-South Institute
NVB	National Women's Movement (Nationale Vrouwenbeweging)
OAS	Organisation of American States
PAHO	Pan American health Organisation
SIB	Foundation for Indigenous Peoples in Highland Suriname (Stichting Inheemsen Boven-Suriname)
SRD	Suriname Dollar
SRH	Sexual and Reproductive Health
STINASU	Stichting voor Natuurbehoud Suriname
SURALCO	Suriname Aluminum Company
TALAWA	Taren (Trio) and Wayana Foundation
UNDP	United Nations Development Program
USD	United States Dollars
WHO	World Health Organisation
WWF	World Wildlife Fund

SUMMARY

Study context

This report presents the results of an ethno-ecological baseline survey (EES) among the Trio Indigenous Peoples of Suriname, which was conducted between April and September 2007. The Trio EES was commissioned by TALAWA and Amazon Conservation Team-Suriname (ACT), with funding from the BHP Billiton (to TALAWA) and the OAS (to ACT). Its main objective is to:

> *Provide current, reliable data on the natural, human, social, financial, and physical capital features that characterize the Suriname Trio, in order to identify both vulnerabilities and opportunities that may either obstruct or facilitate the development of more sustainable Trio livelihoods.*

The consultant, the indigenous organization TALAWA, hired an interdisciplinary research team to conduct fieldwork in the Trio communities of Sandlanding, Wanapan, Amotopo, Lucie, Kuruni, Kwamalasamutu, Sipaliwini, Alalapadu, and Tëpu. Using the sustainable livelihoods approach, the researchers collected data on physical, natural, social, human, and financial capital. Primary data obtained through surveys, open interviews, and field observations were complemented by secondary data from reports, maps, publications, and other sources.

Back ground

Suriname is located on the northern tip of South America. Its small and ethnically diverse population lives primarily in the coastal zone. The forested interior, which covers 80% of the country, provides sustenance to Indigenous Peoples and Maroons. These interior regions are marginalized in their access to public services such as education, health care, clean water, electricity, and communication networks.

The Trio occupy a large area in the northern Amazon Region, on both sides of the Suriname-Brazil border. In Suriname, the Trio live in the upper Sipaliwini-Corantijn River basin and the Tapanahoni-Palumeu River basin. They have no formal rights to these lands though, which leaves them vulnerable in the face of large-scale resource exploitation schemes by the Government of Suriname and private industry.

The Trios probably moved from Brazil to Suriname around the late 17th century. By the first half of the 20th century, introduced diseases led to rapid decreases in population numbers. In the 1960s, Baptist missionaries convinced the Trio to live in larger population centers where they were given health care and missionary education. This transition caused dependency on manufactured goods, the loss of traditional knowledge, and the over-extraction of selected natural resources. In recent years, Trio Granman Asongo has been motivating his people to disperse again.

Presentation of field data: Five capital types

Natural capital refers to natural resources, such as the forest with its flora and fauna, sources of fresh water and mineral resources. The majority of the study area is occupied by rocks of the Trans Amazonian granoit-volcanic complex. Other than most of Suriname, the Trio area has only one dry and one rainy season. Landscape characteristics and the presence of fresh water rivers determine the location of Trio settlements. The vegetation is dominated by lowland forest. Other vegetation types in the Trio-area are floodable forest, secondary forest, liana forest, mountain forest and savanna related vegetation.

The list of most frequently used plants among the Trio is lead by palms, which are used for roofing thatch and for their fruits. Other trees and plants provide material for the construction of houses and shelters, furniture, canoes, paddles, twining rope, hunting and fishing gear, weapons, food, medicines, body care, and other uses. Forest fruits, nuts and honey supplement to the Trios' diet. The Trio rarely use plants for commercial purposes.

Hunting and fishing occur year-round but are seasonal for some animals. The favorite hunting weapon is the shotgun; other used methods are the bow and arrow, traps, or catching by hand. Fishing occurs mostly with a long land line and nylon fishing nets. As animal husbandry is rare, bush meat and fish are the main sources of dietary protein. Animal parts also are used for tools, utensils and musical instruments. In various villages, hunters and fishers sell fresh fish, bush meat, and live animals. Prices paid to the trappers are low.

The Trio area hosts several protected plants and animals that are listed internationally as threatened or endangered, and many among them are rare or endemic to the Guiana Shield. Two nature reserves are present in the area to protect wildlife and their forest habitat: the Sipaliwini Nature Reserve and the Central Suriname Nature Reserve.

The Trio farming system is based upon shifting cultivation with a high agricultural biodiversity. The most important staple crop is cassava, which is planted alongside other staples, vegetables, and fruits. The Trio also grow fruits and utility crops in the vicinity of their houses. Agricultural plots are selected for accessibility, drainage conditions, the absence of leaf cutting ants, soil texture, and flatness. Leaf-cutting ants and agouti are the most damaging agricultural pests, followed by other mammals and some birds. Traditional knowledge of fauna and flora and ecological practices are at risk of being lost.

.

Human capital includes the skills, knowledge, ability to work, and good health that enable people to pursue livelihood strategies. The 'Trio' are a conglomerate of more than 15 sub-groups who to a large extend share a history, culture, and language. In addition, non-Trio individuals such as Akuryo and Waiwai live in Trio villages. An estimated 1492 Trios live in Suriname (excl. Paramaribo and Palumeu), in 341 households. The average Trio woman has given birth to 3.5 children. Trio household (av. 4.25 p.) are typically larger than those in Sipaliwini district and those in Suriname as a whole.

Only two elementary schools are found in the Trio area; in Kwamalasamutu and Tëpu. Children from Wanapan and Sandlanding attend school in Apoera, children in Sipaliwini are occasionally taught in a makeshift community-school, and children in other villages do not go to school at all. The existing schools are short of qualified teachers and writing materials. Educational achievement in all Trio villages is relatively low. Male and female heads of household have, on average, attended school for 2 to 3 years and most do not speak the national language. Many obstacles -including the language barrier, poorly educated parents, and corporal punishment at the schools- make that most children double classes and/or drop out. There are no opportunities to attend secondary education in the Trio area and also practical training courses are extremely limited.

The Medical Mission Primary Health Care – Suriname (*Medische Zending- MZ*) has clinics in Kwamalasamutu, Tëpu, Sipaliwini, Kuruni, and Alalapadu. People from Wanapan, Lucie, and Amotopo travel a day to reach the nearest health post – provided there is a boat, an outboard motor, and fuel. Population health appears to be reasonable. The main health problems are malaria; colds/flue; diarrhea; poor nutrition; and infections. Sexual and reproductive health is threatened by unsafe sexual practices leading to early teen pregnancies, unsafe abortions, and a high risk of HIV/AIDS transmission.

When the Trios were converted to Baptism, the Shamans' central role in society withered. Today alarmingly few people in the Trio communities know how to make forest medicines. ACT's shaman's apprentice program in Kwamalasamutu (2000) and Tëpu (2001) promotes the preservation of traditional medicinal knowledge.

Social capital refers to social networks and norms, organizational and institutional structures, migratory networks, and safety nets. The Trio are poorly represented in national government structures. The tribal authorities - Granman, Kapitein, and Basja- receive a public honorarium and are accountable to the national government. However, their functions and powers are not defined or endorsed by law.

In the absence of a strong public social security system, community members take care of the most vulnerable groups in society. In the most acculturated villages, such as Kwamalasamutu, however, traditional caring and sharing systems are making place for a greater degree of individualism. Neither the Suriname government nor the Trio communities have strategies in place to cushion the effects of region-wide disasters. In 2006 and 2007, NGO's, the Suriname government and Trios collaborated to help Trio families that experienced acute food shortages due to flooding. Most help focused on emergency relief, however, and did not improve food security in the long run.

The Trio are organized in the regional foundation TALAWA and part of several national indigenous organizations. Communication between any of these organizations and the common Trio people is limited. Few communities have active Community-Based Organizations (CBO). Crime is virtually non-existent in the smaller Trio settlements. In Kwamalasamutu, petty theft, drugs use and trade, and prostitution are on the rise. Domestic violence and sex crimes (e.g. sexual molest or rape) are quite common yet not recognized as crimes. In the absence of national law enforcement agents, the traditional authorities

decide on guilt and punishment. A team of indigenous park rangers helps maintain order in Kwamalasamutu since 2007.

Migration data shows that despite their concentration since the 1960s, Trio families continue to move around to either temporarily or permanently live in another community.

Financial capital represents (sources of) cash money and other valuables. Financial infrastructure in the form of banks is absent in the Trio area. As wage labor jobs are rare, most Trio families rely on the natural environment for cash income. They make traditional handicrafts (mostly women); sell birds, frogs and snakes (primarily Sipaliwini and Tëpu); sell bush meat and fish (Wanapan and Sandlanding); and work in the gold mines along the Lawa river. The main non-resource related source of income is wage labor, with the government being the main employer. Other jobs include sale and resale of consumer goods, work with NGOs, and Brazil nuts harvest (Alalapadu).

Trios spend most of their earnings in Paramaribo. Corantijn Trios most frequently visit the coastal area. An analysis of asset ownership suggests that households in Tëpu and Sipaliwini, which are actively involved in the animal trade, are relatively wealthiest. Relatively poorest are the families from Sandlanding and Wanapan.

Private enterprises active in the Trio area focus on tourism and mining. (Eco)tours visit Sipaliwini, Kwamalasamutu, Amotopo, and Wanapan, but Trios are barely involved and earn little from them. Gold is not yet exploited in the Trio area. The projected construction of a large-scale bauxite mine in the Bakhuys area is not likely to affect the Southern Trio communities, but Sandlanding may experience noise and air pollution from a nearby harbor facility. If the Government of Suriname executes its plans for an 'integrated bauxite industry', which relies on electricity from a hydropower plant in the Kabalebo watershed, especially the Corantijn villages would be severely impacted.

Active donor and development organizations in the Trio area in 2006-2007 include CDFS, PAHO/WHO, ACT, CI, UNDP, Global Fund, and SIB. These organizations have provided financial, logistic, and other relevant support for the execution of projects in the target areas of health, education, income generation, and biodiversity conservation.

Physical capital comprises physical infrastructure such as roads, structures, and physical assets in the communities. Apart from Sandlanding, no Trio village can be reached by road Access is provided by plane or by boat. The Trio territory also is out of reach of telecommunication networks, newspaper selling points, and radio- and TV broadcasting.

Trio houses are usually built of natural materials. The Suriname Water Company (SWM) does not service the Trio communities. Instead families rely on rain water and on rivers and creeks. Currently a water system is built by the community of Kwamalasamutu with help from ACT. Sanitary conditions are unhygienic throughout the study area. The shared outhouses tend to be dirty, and almost everyone uses the river or the forest for defecation. Also the Energy Company of Suriname (EBS) does not reach the Trio. Only the village of Tëpu has a working community generator from the government. However, often there is no

fuel and not all houses are connected. In the remaining villages people have to fend for themselves. Better-off households own private generators (13.5 %) or solar panels (4.8 %).

Apart from a selected few elderly, few Trios still wear their traditional dress and ornaments. Traditional jewelry continues to be popular among woman and men.

Synthesis

Identified vulnerabilities, problems and risks include:

Natural capital:
- Increasing need for cash leads to wildlife (and plant) trade.
- Poor preparedness for extreme weather events and other natural disasters.
- With population growth in the largest Trio settlements, extraction levels may exceed the forest's carrying capacity locally.
- Loss of ancient knowledge of use of surrounding fauna and flora.
- Need for a changing ecosystem management due to extern influences.
- The lack of land rights/titles for Indigenous individuals and communities.

Human capital:
- Poor or no access to basic education for Trio children.
- Threats to sexual and reproductive health, including unsafe abortions, early teen pregnancy, and high-risk sexual behavior.
- Lack of access to health facilities in some of the communities.
- Loss of traditional cultural knowledge of, among others, music, dance, and stories.

Social Capital:
- Limited representation within the Central Government of Suriname.
- Functions and powers of the traditional authorities within the national political and legal systems are undefined and unclear.
- Low level of community-based organization.
- Rise of criminal behavior - theft, drugs use, prostitution, rape- in Kwamalasamutu.
- Virtual absence of sports and leisure facilities for youth.
- Lack of national and community based systems to cushion household shocks.

Financial capital:
- No access to national financial infrastructure obstructs small business development.
- Heavy reliance on the natural environment for income.
- Dependency on outsiders for income from Brazil nut production and tourism.
- Possible construction of a hydropower facility will flood a large part of the Trio traditional homelands, including villages.
- Donor assistance can create passivity and discourage self-help initiatives.

Physical capital:
- Isolation; no connection to roads or communication and information networks.

- Lack of reliable sources of electricity and drinking water.
- Unhygienic sanitary conditions.

The researchers identified a variety of opportunities, capacities, and resources to overcome these negative forces and develop more sustainable livelihoods:

Natural capital:
- Abundance of forest resources, including a range of Non Timber Forest Products (honey, Brazil nuts, oils, fruits, crafts, medicinal plants).
- ACT's Shaman's apprentice program.
- Well considered and sustainable eco-tourism activities.

Human capital:
- Widespread literacy.
- Presence of Trios with some education and knowledge of Dutch, who could serve as teachers in community schools.
- Generally good health; low HIV- prevalence rates.
- Knowledge of medicinal plants and traditional healing practices still present among shamans and elders.
- ACT supports the preservation of traditional cultural and medicinal knowledge.

Social capital:
- The Trio are becoming more vocal in national politics.
- Establishment of TALAWA to represent the interests of the Trio and Wayana in national policy making and other national level affairs.
- Overall low crime rate.
- Establishment of a park rangers unit may help fight crime in Kwamalasamutu.
- Socialization at kasiri parties and in church strengthens social cohesion, which in turn is crucial in the maintenance of social safety nets.

Financial capital:
- NTFPs provide opportunities for sustainable income generation, e.g. Brazil nuts.
- Ecotourism has a potential to provide more direct and indirect income to Trios.
- Bakhuys project may provide employment to the villagers of Sandlanding.
- More frequent travel to the city can be used for the marketing of crafts.
- A variety of donor organizations is willing to invest in the Trio area.

Physical capital:
- Existence of foot paths that link the different Trio villages.
- Throughout the Trio territory people are skilled in building traditional homes.
- Many adults still have knowledge to make and wear the traditional dress.
- Construction of a water system in Kwamalasamutu.

TABLE OF CONTENTS

CHAPTER 1
INTRODUCTION

This opening chapter introduces the main actors in this report: the Trio indigenous peoples of Suriname. It explains why this study was conducted and lays out the study aims and objectives. Next it outlines the research approach and identifies the target audience. The chapter ends with an overview of the report lay-out.

1.1 Prelude

When the Europeans first set foot on land in the Americas they did not encounter an empty land. Numerous indigenous groups populated the area, displaying an enormous variety of physical characteristics, cultural expressions, languages, lifestyles, and knowledge systems. One thing these diverse ethnic groups had in common: Soon after exposure to European treachery, guns, and infectious Old World diseases, they were decimated in numbers. Once fierce and formidable tribes were reduced to a couple of families or individuals; many of them ill, mall-nourished, and suicidal.

Millions of indigenes may have inhabited the greater Amazon region around 1500. They lived in established chiefdoms and small family bands, as sedentary agriculturalists and nomadic hunter-gatherers. These ancient indigenous societies interacted with outsiders through trade, markets, warfare and trekking. They also altered their landscape though fire management, agricultural engineering, hunting, and fishing. Some groups eventually established trade relations with the newcomers. Others, however, preferred to keep their distance and withdrew further into the dense tropical forests. The Trio indigenous peoples of South Suriname, who are the focus of this study, belong to this latter group.

Until the 20th century, the Trio had virtually no contact with other segments of the nation states they were moving in and out of. They abandoned their relative isolationism in the early 1960's, when they were persuaded by US missionaries to live in a few larger population centers. Lowered in numbers and suffering from bad health, the Trio embraced the protection, medical care, education, and evangelizing words offered by these *pananakiri* (outsiders).

Today, the Trio (and Wayana) indigenous groups of South Suriname are recovering from the initial impacts of contact. The populations seem to be growing and are relatively healthy. The communities have become integrated into the national health, educational and civil registration systems. Also few modern-day Trio families continue to be self-sufficient; they prefer to travel in a motorized dugout canoe rather than paddle, wear modern clothes and shoes, use plastic cups and plates, eat sardines and popcorn, and watch the latest action films on DVD. In recent years the Trio also have become more vocal, now actively addressing national government representatives to demand rights to land and other resources.

Despite the Trios' increased integration into mainstream Suriname society, not many Surinamers are aware of their existence. Few non-indigenous Surinamers are able to name a Trio village, and even fewer have ever visited such a village. This includes government representatives and other people with the power to determine where the next school will be built, whose voices are listened to in political decision-making, and what development plans will be executed in the Suriname interior. With this report we aim to generate a better understanding of, and respect for, some of the earliest inhabitants of Suriname; the Trio

1.2 Study aims and objectives

This report presents the results of the Trio Ethno-Ecological Survey 2007, a detailed baseline survey that was conducted among the Trio Indigenous peoples between May and August 2007. The study broadly characterizes the Trio society in terms of social make-up, cultural expression, political organization, physical infrastructure, and environmental issues. Its main objective is to:

> *Provide current, reliable data on the natural, human, social, financial, and physical capital features that characterize the Suriname Trio, in order to identify both vulnerabilities and opportunities that may either obstruct or facilitate the development of more sustainable Trio livelihoods.*

The specific objectives are to:

1) Collect detailed field data about the Trio communities of Kwamalasamutu, Tëpu, Palumeu (mixed Wayana-Trio), Alalapadu, Sipaliwini, Amotopo, Kuruni, Lucie, Wanapan and Sandlanding;
2) Review and compile existing literature of the Trio and their living territory;
3) Use the sustainable livelihoods approach to characterize the named communities and their inhabitants in their use of, access to, and control over natural, physical, human, financial, and social resources.
4) Identify
    a. Vulnerabilities, threats, and problems;
    b. Constraints to sustainable community development; and
    c. Capacities, resources, and opportunities to overcome these constraints in the target communities.

The main reason for the study is to assist policy makers and development organizations in building more sustainable livelihoods for Trio individuals, families, and communities. In this context, the present baseline data are a first step towards the design of programs aimed at reducing the vulnerability of Trio communities and strengthening their resilience. The project Terms Of Reference (Annex I) provides more detail on the specific data the researchers were assigned to collect.

1.3 Study approach

This study uses the "sustainable livelihoods approach" to guide data collection. This method is useful for improving understanding of people's access to the resources, skills, and knowledge that may help alleviate poverty and achieve development goals. By recognizing the multiple dimensions of poverty, the Sustainable Livelihoods Approach aims to develop an accurate and dynamic picture of people in their environment. This provides the basis for identifying vulnerabilities and other constraints to livelihood development and poverty reduction. Such constraints can lie at the local level or in the broader economic and policy environment. An important principle of the approach is the analysis of strengths and opportunities in the face of constraints. These positive forces can derive from strong social networks, access to natural resources (e.g. wildlife), specific skills and knowledge (e.g. traditional medicinal knowledge), or other factors that have poverty-reducing potential.

Our field visits to all known Trio communities have opened our eyes for the enormous diversity between and within villages. We had expected to encounter 'typically Trio' cultural expressions, lifestyles, economic activities, social structures, problems, and development priorities across the larger Trio territory. Instead we found significant regional differences in virtually all livelihood indicators. The pressure that 167 Kwamalasamutu households place on the natural environment is, naturally, incomparable to that of the six Amotopo families. Whereas Alalapadu depends economically entirely on the production of Brazil nuts; Sipaliwini and Tëpu households live of wildlife trade; and government wages support the village of Kuruni. Tape's children attend a government school; those of Sipaliwini are educated in a makeshift local school by untrained locals; the kids of Wanapan are sent to Apoera for education; and those of Amotopo, Lucie, and Kuruni do not go to school at all. Agricultural pests, drugs use, and reproductive health problems that plague some villages are negligible elsewhere. Throughout this report we will emphasize this diversity, and identify both vulnerabilities and opportunities for each specific location.

1.4 Beneficiaries

1.4.1 TALAWA

This study was commissioned by TALAWA, a relatively young foundation of Trio and Wayana representatives from indigenous villages throughout South Suriname. The rich set of baseline data may be used and explored by the Trio peoples of today and tomorrow. It presents a snapshot of their lives, environment, and livelihood activities in the early 21st century. The community can use the present data to lobby for support from NGO's or governmental organizations, for their own development and resource management planning, or simply read it for their own interest.

1.4.2 Amazon Conservation Team

The Amazon Conservation Team (ACT) Suriname co-authorized this study. ACT is an independent NGO (Foundation) that works in partnership with indigenous peoples in conserving biodiversity, health and culture. This institution has established long term partnerships with the Trio.

The baseline data presented in this study will inform the organization in planning, monitoring, and evaluation of its field projects. Regular baseline data collection will allow ACT and the community to identify and adaptively respond to negative changes before they become problems; to learn from positive changes; to measure the impacts of development programs on community well-being; and to remain informed about changing needs and desires among the Trio.

1.4.3 BHP Billiton Maatschappij Suriname

TALAWA received funding from the NV BHP Billiton Maatschappij Suriname (BMS) to execute the present study. BMS is the world sixth largest producer of primary aluminum. BMS has expressed it interest in the development of an exploration program in the Bakhuys Bauxite Concession in West Suriname. The Trio community may experience both positive and negative effects following the construction and operation of a bauxite mine (see Chapter 5). For BMS/Suralco to make informed decisions about its future activities in the area, it is important that they obtain a better understanding of the human and ecological resources that may or may not be impacted.

1.4.4 Organization of American States

The Organization of American States (OAS) co-financed this study through ACT-Suriname. The OAS, which has recently expressed its commitment to supporting development among Southern Indigenous groups, may find the present data useful for project planning. At present the Organization financially assists ACT and the Trio community of Alalapadu with an income generation project based on the production and marketing of Brazil nuts. In addition, the OAS has been supporting cross-border (Brazil-Suriname) initiatives, such as the development of a border protection system through collaboration between national governments and indigenous park guards.

1.4.5 Other beneficiaries

The data collected for the Trio Ethno-Ecological survey will be of practical use to any national or international organization working in the Trio area. By providing a detailed picture of the community, its needs, and its aspirations, the data allow for faster and more efficient project development. We also anticipate that the data will be of use to scientists conducting social science or biophysical research in the Trio territories of Suriname.

Furthermore, the present data will help policy makers to check the current status and monitor progress towards the Millennium Development Goals in the Trio territory. Beneficiary government agencies are the Ministry of Regional Development and its District Commissariat of Sipaliwini. Private companies such as (eco)tour operators may also be interested in learning more about the Trio, among others to better inform tourists.

1.5 Lay-out

This report consists of ten chapters, which are preceded by an executive summary that presents in brief the most essential aspects and results. This introductory chapter is followed by three more general chapters that discuss the methodology (Ch. 2), characterize the study location (Ch. 3), and describe the history of human occupation in South Suriname, in particular arrival and settlement of the Trio peoples in Suriname (Ch. 4).

After this general section we will proceed with the data chapters Five through Nine on natural, human, physical, social, and financial capital. The report concludes with a synthesis, which presents the main findings in the five asset categories. In this section we discuss threats and problems to the sustainable development of Trio lands, and identify priorities and aspirations of the local population. Sources of secondary data are listed in the references and all bulky data are put together in the appendices.

CHAPTER 2
METHODOLOGY

This chapter describes the methods used for data collection and analysis. We first discuss the research strategy, explaining the concept and practical application of the sustainable livelihood approach. Next we list the members of the research team and the activities performed. Sections 2.4 and 2.5 provide detail on the methods used for primary and secondary data collection, respectively. The analysis of these data is the topic of section 2.6. Logistics are described in section 2.7, and the chapter concludes with a brief evaluation of challenges and problems encountered in the field.

2.1 Research site

Research was conducted in nine Trio villages and their surroundings in South Suriname, namely: Kwamalasamutu, Alalapadu, Sipaliwini, Kuruni, Amotopo, Lucie, Wanapan, Sandlanding, Tëpu, and Palumeu (mixed Wayana-Trio) (Fig. 3.4-3.6). These villages are located in the watersheds of the Tapanahoni, the Corantijn, the Kuruni, and the Sipaliwini Rivers. In each location, we visited in addition to the village itself nearby agricultural plots and natural elements of interest.

Apart from Sandlanding and Palumeu, which is located on respectively the Arowak and Wayana homelands, all named villages are located on Trio customary lands. We did not include the Trio living in Paramaribo or elsewhere outside the Trio villages. Chapter III provides a more detailed site description and maps.

2.2 Research Framework: Sustainable Livelihoods Approach[1]

This study follows the Sustainable Livelihoods framework. The Sustainable Livelihoods Approach was first developed by the UK Department For International Development (DFID)[2]. This institution defines sustainable livelihoods in the following way:

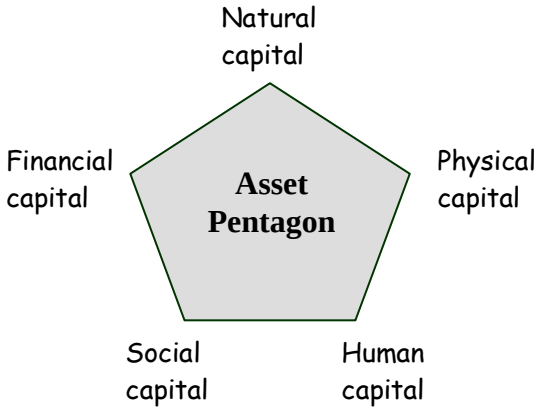
> "A livelihood comprises the capabilities (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base" (Scoones, 1988)

Livelihood is a broad concept that encompasses virtually all aspects of daily life. These aspects can be organized in five categories of physical, natural, social, human, and financial capital. These five capital types are organized in an asset pentagon (Figure 1)

[1] This section was copied from the Wayana baseline study, conducted by the same authors, which made use of the same theoretical framework.
[2] http://www.livelihoods.org/info/info_guidancesheets.html

- *Natural* capital refers to natural resources, such as the forest with its flora and fauna, sources of fresh water, and mineral resources. It includes both public goods such as clean air and biodiversity and access to assets that people use for production such as arable land and fruit trees.
- *Human* capital includes the "skills, knowledge, ability to work and good health that enable people to pursue different livelihood strategies and achieve their livelihood objectives."[3] It includes education, access to information, good health, and social security.
- *Financial* capital represents (sources of) cash money and other valuables that are used as stock. It includes issues such as employment, savings, income, the investment climate, and access to credit.
- S*ocial* capital refers to "connections among individuals; social networks and the norms of reciprocity and trustworthiness that arise from them"[2]. Data on social capital cover organizational and institutional structures, conflicts, migratory networks, and formal and informal social safety nets.
- *Physical* capital comprises mainly physical infrastructure such as roads, railways, markets, clinics, schools and physical assets in the communities

Figure 1. Asset Pentagon



We use the Sustainable Livelihoods approach because it places people rather than economic indicators at the center of development. The data collected will reveal vulnerabilities and obstacles to development, as well as the material and immaterial assets that may help the communities overcome these problems. In doing so, the Trio Baseline Study will facilitate the identification of practical priorities for action that are based on the views and interests of those concerned.

Finally, as development organizations including the World Bank and the DFID are increasingly using the SLA approach, it will be easier to compare our data to those collected in other regions and countries. The IDS website (http://www.livelihoods.org/) explains the SLA in more detail and provides guidance sheets for its use.

[3] DFID, 2003: Sustainable Livelihoods Guidance Sheets.
http://www.livelihoods.org/info/guidance_sheets_rtfs/Sect2.rtf

2.3 The Consultant

The Consultant responsible for execution of this study is TALAWA (Abbreviation for Trio and Wayana), an interest group for the Trio and Wayana indigenous peoples, chaired by Hoofdkapitein Ewka of Sipaliwini. TALAWA also has been responsible for financial management of the project.

The research team hired by TALAWA to execute the fieldwork was composed of two senior researchers: anthropologist Marieke Heemskerk (MH) and agro-ecologist Katia Delvoye (KD). A social science research assistant from the Anton de Kom University of Paramaribo joined the team for two weeks to supervise household survey-work in Kwamalasamutu (MP). A tree expert affiliated with the Department of Nature Management (*Natuur Beheer*) from the Ministry of Natural Resources was hired for five days to assist with ecological data collection (FD).

In addition to these academically trained researchers from outside, local research assistants were hired and trained to conduct the household surveys in the larger villages of Tëpu and Kwamalasamutu. Trio translators from Paramaribo helped to translate the survey forms in the Trio language to facilitate data collection for the Trio survey assistants. In the smaller villages, the interviews were conducted by the senior researchers with the assistance of local Trio interpreters. ACT staff members in Paramaribo supported the field team with information, maps, advice, logistic arrangements, and administration. A list with names and contact information for the people and institutions involved in the EES is attached as Annex II.

2.4 Time table and location of activities

Data collection occurred between April and August 2007. During these four months, the researchers visited the following villages:

	Dates (2007)	Location	Researchers
1	28 April- 2 May	Wanapan, Corantijn River	MH, KD
2	17-22 May	Sandlanding, Corantijn River[4]	MH, KD
3	26- 30 May	Sipaliwini, Sipaliwini River	MH, KD
4	June 18-21	Alalapadu, Sipaliwini River	MH
5	July 26-28	Amotopo, Corantijn River	MH, KD
6	July 28-30	Kuruni, Kuruni River	MH, KD, FD
7	July 29	Lucie, Corantijn River	MH, KD, FD
8	June 14-21	Kwamalasamutu, Sipaliwini River	MH, MP
9	July 5-11	Tëpu, Tapanahoni River	MH
10	August 11-13 2006 [5]	Palumeu, Tapanahoni River	MH, KD

[4] Inclusive 1 day in Apura

The study of secondary data, the entry and analysis of primary data, and report writing took place throughout these four months and continued through August.

A first draft report was submitted by September 2007 to the Amazon Conservation Team and NV BHP Billiton Maatschappij Suriname for comments. After revisions, the final report was completed by December 31st 2007.

2.5 Methods used for primary data collection

The study integrates qualitative analysis with quantitative data presentation. The in-depth, qualitative narratives are designed to improve the readers' understanding of the livelihood challenges and opportunities of the Trio people. The numeric data, in turn, provide reference points or indicators that may help develop, execute, and monitor development projects in the area.

2.5.1 Social science data

Two different survey templates were used for the collection of social science data from the various villages (Annex III):

(A) Community survey, to characterize the community in terms of the five asset categories. The purpose of the questions in this survey is to establish an inventory of community-wide access to educational facilities, health care, political structures, social resources, and public utilities (drinking water, electricity, phone), among other things.

(B) Household survey, to be conducted with household head(s). The purpose of this survey is to provide social, demographic, economic, health and other information about both the household and individual household members.

Data for the community survey (A) were typically collected using a combination of village meetings, key informant interviews, and observations.

To obtain household-level data, we started in each village by counting all households and recording the number household members with, if known, their ages. We considered as a household all people sleeping under one roof. We realize that this definition is somewhat artificial, as family members sleeping in neighbouring houses typically take care of one another and share (most of) their resources. Notwithstanding, the house-based definition is most practical in the field and serves the needs of this study.

In the smaller villages, surveys (B) were conducted with the heads of all households that were present during the field visit. In the larger villages we drew a random sample of households to be interviewed. Randomization occurred by first listing all households, and

[5] Palumeu was visited by the researchers in 2006, during data collection for the Wayana EES. No Trio households were interviewed in this village for the current study.

subsequently selecting every second household for surveying. If the people in that house were temporary absent (e.g. because they had traveled to Brazil or another village), the surveyor would go to the first house next or prior on the list. A total of 204 households in the nine Trio communities responded to the survey, representing 60 percent of all Trio households in the interior (excl. Palumeu). Table 2.1 provides summarized information for the sample.

To support the survey templates, qualitative interviews were held with various key informants and stakeholders. This group included village authorities, heads of formal community organizations, health workers (shamans and public health), school teachers and people belonging to specific occupational groups.

Table 2.1. Household survey sample characteristics

Village/ Settlement	**River**	**Inhabitants N**	**House-holds N**	**Sample n (households)**	**Sample %**
Wanapan	Corantijn	34	9	7	78 %
Sandlanding	Corantijn	33	7	6	86 %
Amotopo	Corantijn	15	6	4	67 %
Lucie	Corantijn	18	5	-	0 %
Kuruni	Kuruni	35	9	9	100 %
Kwamalasamutu	Sipaliwini	685	167	90	54 %
Sipaliwini	Sipaliwini	214	37	17	46 %
Alalaparu	Sipaliwini	65	15	15	100 %
Tëpu	Tapanahoni	393	86	56	65 %
Palumeu	Tapanahoni	-	-		0
Total		**1491**	**341**	**204**	**59.8 %**

2.5.2 Ecological data

Ecological data for the Trio area were collected by means of:

- In-depth interviews with knowledgeable persons on flora and fauna, crops, agricultural practices and resource use in Wanapan, Sandlanding, Sipaliwini, Amotopo and Kuruni.
- Focussing on hunters and fishermen about their hunting and fishing habits, the species, the amount, the difference between the past and present, the use of their catch and their hunting/fishing problems in every village.
- Informal conversations with hunters, fishers, and cultivators.
- Observations of agricultural activities and resource use in the visited villages, around camps and at agricultural fields.
- Observations of vegetation, flora and fauna, soil, landscape and water resources during field trips (mainly along main rivers).
- Water quality tests of the nearby river/creek in the Trio settlements of the Corantijn drainage basin.

To facilitate communication during the fieldwork, clear illustrations on wild fauna in the Guianas (WWF 2003), on birds (Haverschmidt & Mees 1994), on snakes (Abuys 2003), on fishes (Berrenstein 2005) and richly illustrated books on trees and fruits (Rohwer 2002, Veer 2001,2003 and Nowak and Schutz 1999) were brought to the villages. This method proved to be of great assistance.

The ACT 2003 Ecological Survey of the Trio territories by D. Noordam and P.A. Teunissen, with the assistance of F. Van Troon, was used as main secondary resource. This study includes extensive lists of vegetation, crops and wildlife used by the Trio. The data of the above-named researchers, who did field research in Kwamalasamutu and surroundings, also cover the local geology, climate, soils and landscape coverage. Various detailed maps were assembled by these researchers, indicating the location of the Trio territory and their villages, as well as various environmental aspects.

The assessment of natural resources data of the Trio communities in Kwamalasamutu and Alalapadu, not visited by Delvoye, was obtained trough recent secondary data (Teunissen & Noordam 2003, Parahoe, 2001) and through ACT's land management and biodiversity coordinators, who worked extensively on this matter with the Trio of those villages. For the geological/geomorphologic data valuable assistance was given by geologist Algoe, lecturer at the Anton de Kom University of Paramaribo.

2.6 Methods used for secondary data collection

Study of secondary material, took place in Paramaribo. This data was collected from books, papers, reports and internet documents and included written sources, maps and satellite images from:

- Personal collection of the researchers
- ACT documentation centre
- ADEK library (Anton de Kom University)
- General Bureau of Statistics (ABS)
- KITLV library (Royal Institute for the Study of Language, Countries, and Peoples)
- Meteorological service
- Internet

The bibliography contains a list of consulted literature and web sites.

2.7 Data analysis

Socio economic data collected through household surveys was entered in an Excel spreadsheet and analyzed with the statistical software package SPSS. Other anthropological data was analyzed qualitatively.

The ecological field data that has been collected were, if sufficiently quantitatively relevant enough, analysed with statistical functions. Other data was analyzed qualitatively or entered in an Excel spread sheet so that informative charts could be produced.

2.8 Research logistics

The ACT-Suriname has been responsible for organizing charter flights to the interior. For the visit to Sandlanding, the research team was able to share BHP Billiton flights. For introductions to relevant people in the field, we mostly relied on the village authorities, with who the researchers have been acquainted for some time. The researchers were financially accountable to TALAWA and ACT, to whom financial reports were submitted after the conclusion of each field trip.

Radio and personal communication were used to request research permission from the village heads of the various Trio villages prior to starting data collection. After endorsement by the respective Kapiteins, the research team traveled to the different villages. In each community, the fieldwork team began by calling a general village meeting with assistance of the local leaders (Kapiteins and Basjas). These meetings served to introduce the outside researchers and to inform the community about the study objectives and format. In subsequent days, the team divided field tasks to complete data collection.

2.9 Challenges

One of the main challenges in data collection in the Trio communities was the language barrier between the outside researchers -who spoke Dutch and Sranantongo- and the Trio people, not all of whom were fluent in either of these languages. The inability to communicate directly with some of the key informants complicated the collection of both social science and biological data (e.g. on hunting and fishing). The language barrier was reduced by using a translator in the smaller settlements, and by delivering the standard survey forms in the Trio language in Kwamalasamutu. In addition, richly illustrated books on trees and fruits (such as Rohwer (2002), Veer (2001, 2003) and Nowak and Schutz (1999)), and illustrations of wildlife from the WWF field guide were brought to the communities to facilitate communication about flora and fauna in the area.

A second challenge was to collect truthful answers to our queries in a relatively short time that did not allow for the development of in-depth relationships with the local population. This problem was partly resolved by working with local survey assistants and by doing objective observations during the presence in the field. In addition, the long-term working relationship of ACT with the local communities helped us obtain cooperation from the local Trio population and gain their trust.

Thirdly, the selected survey assistants had varying degrees of experience with and skills in survey work. When entering the data, it was discovered that some assistants had not understood all questions as they were meant. In other cases, we suspect that the surveyor

'helped' the interviewees answer difficult questions by suggesting answers. In these cases we have excluded the answers from the analysis.

Finally, data on economic indicators such as income and expenditures are biased for various reasons. People who earn irregular, variable and unpredictable incomes, such as women selling necklaces and bracelets made of seeds, are unlikely to accurately remember how much they earned over a certain time period. Moreover, people may purposely give false answers because they want to give desirable answers; want to hide things; or hope that certain answers will lead to benefits. We tried to limit the margin of error by checking field data against our judgment of realist values based on several years of experience working in the interior.

CHAPTER 3
STUDY LOCATION

This chapter geographically positions the Trio and places them within a broader socioeconomic, cultural, and political context. It starts with a description of Suriname. Table 3.2 provides basic statistic that numerically characterize Suriname's geography, population, and economy. Next we will zoom in to the Trio territory. We show the more precise location of the Trio communities and discuss issues of demarcation.

3.1 SURINAME

3.1.1 Natural environment and geophysical conditions

The Republic of Suriname (land mass: 163,820 km^2) is located on the Northern tip of South America North of Brazil between Guyana and the French Department of *La Guyane* (also called French Guyana). Suriname has border disputes with French Guyana (area between the Litani River and the Lawa River) and with Guyana (area between the two main head waters of the Corantijn River and marine territory).

Fig. 3.1 Suriname in Latin America

Suriname's proximity to the equator (2-6° N; 54-58° W) makes for year-round tropical temperatures. Daytime temperatures in Paramaribo range between 23 and 31°C, with an annual average temperature of 27°. The range in average temperatures between the warmest months, September/October, and the coldest, January/February, is only 2°C. The main seasonal variation is between the dry and the rainy seasons (December-January and May-August). Rainfall is highest in the central and southeastern parts of the country and averages 2200 mm/yr. The relative humidity is high, ranging from 70 to 90%.

Suriname's coastal zone is characterized by mud flats that are formed by currents in the Atlantic Ocean that carry silt from Amazon rivers. The typical vegetation in the coastal and riparian zones consists of woodland and mangrove forest on sandy beaches. Further land-inward one finds savanna, swamps, and lowland coastal forest. Far in the South of Suriname there is another savanna area called the Sipaliwini Savanna. The remaining, southern 80 percent of the country is covered with dense tropical rainforest with numerous mountain ranges and complex river systems.

Suriname supports a rich diversity of flora and fauna. Over 5.800 species of mosses, ferns and seeds plants are found in this country, of which an estimated 50% are endemic to the Guyana Shield region (Alonso & Mol, 2007). Suriname is also rich in vertebrate wildlife, including at least 185 mammal species, more than 700 bird species, 152 reptile species, 95 amphibian species, 338 fresh water fish species and 452 marine fish species. Of this known species of vertebrates at least 3% are reported specific to Suriname. Many of the

species found in this land, such as the harpy eagle, the giant armadillo or the jaguar are included in the IUNC list as threatened species and/or in the CITES appendix I of rare or endangered species.

Table 3.2 Suriname basic indicators

Land and natural resources	
Land area	163,820 km^2
Forest area in 2000 as a percent of total land area	86%
Protected areas (% of land area)	12 %
Population	
Population size (2005)	492.829
Population density (inhabitants/km2)	3.01
Annual population growth rate	1.37 %
% Indigenous Peoples (self definition at 7^{th} population census)	3.7
Economics	
National currency	Suriname dollar (1 USD ~ 2.75 SRD)
Per capita GNI, current US dollars	US$ 2230 (2004)
% People living below poverty line	64% (1999)
Main export products	Bauxite, shrimp
Minimum wage (not established by law)	300 SRD (110 US$)/month
Health	
Infant mortality (number deceased < 1yr. Per 1000 life born)	29.8 (2004)
Life expectancy at birth	69.5
HIV prevalence rate (% of population ages 15-49; 2003)	1.7 %
Human capital	
Literacy rate, adult total (% of people ages 15 and older)	89.6% (2004)
Unemployment (% of economically active age searching for work)	9.5%

Sources: ABS 2006; World Bank 2006, World Resources Institute 2006

3.1.2 Population

With less than half a million people (492.829) and an average of 3 persons per square kilometer, Suriname is sparsely populated (Table 3.1)[6]. Approximately 85 percent of Surinamers live on the 30-km wide Atlantic coastal zone. The population is ethnically diverse, consisting of Hindustani (27.4%), Creoles (people of mixed African heritage, 17.7%), Javanese (14.6%), Maroons (tribal people of African descent, 14.7%), People of

[6] ABS 2005. Zevende Algemene Volks- en Woningtelling in Suriname. Landelijke Resultaten. Vol. I. Demografische en Sociale karakteristieken

mixed descent (12.5%), Indigenous peoples (3.6 %), and smaller groups of Chinese, Lebanese, Whites, and others. The urban population (75.4% of total) lives in the coastal area, mostly in the capital city of Paramaribo.

Suriname's interior is inhabited by Indigenous peoples and Maroons. The two largest indigenous groups in South Suriname are the Trio and Wayana. In addition, several smaller tribes populate South Suriname including the Akuryo, Apalai, and Waiwai. Members of these minority groups live in the larger villages dominated by Trio and Wayana. Our research suggests that Southern Indigenous peoples number about 2,000 individuals total.[7]

In addition to Indigenous Peoples, the interior houses six different groups of Maroons: Ndyuka, Saramaka, Aluku, Paramaka, Matawai, and Kwinti. They may number about 50 to 55 thousand people. Both the Indigenous Peoples and the Maroons claim that un-contacted forest peoples continue to live in the Southern Forests, referred to as wild Indians and *lowee-nengee* (Litt: Runaway Negroes). Traces of and/or encounters with these un-contacted tribes are occasionally reported, though other people deny their existence. Since the 1960s, but particularly in the past two decades, others have come to work and live in the forested interior. These relatively new arrivals include Brazilian gold miners, Chinese store owners and loggers, foreign missionaries, nurses and teachers from the city, US Peace Corps workers, and development workers.

Suriname's national language is Dutch but more than 16 other languages are spoken, including Sranantongo (the national lingua franca) and languages specific to the various ethnic groups. Only 0.3 percent of households counted in the national census reports primarily speaking an Indigenous language. This figure is curious given that the vast majority of Wayana and Trio in the interior, who together make up approximately 0.4 percent of the national population, speak almost exclusively their own language at home[8].

The largest religion in Suriname is Christianity (40.7%) but significant groups of the population practice other religions including Hinduism (19.9%), Islam (13.5 %), and traditional religions such as Winti and animist religions practiced by indigenous and Maroon groups (3.3). Just over four percent of the population claims no faith.

3.1.3 Economy

Suriname's developing economy is dominated by the mining industry. Bauxite mining and oil extraction account for 98.7 percent of total foreign exchange earnings. The recent opening of a large-scale gold mine and projected mining activities by national and foreign companies will further stimulate the contribution of mining to the Suriname economy in years to come. Formal mining accounts for 3.4-4% of employment, but indirectly supports

[7] We counted close to 1500 people in the Trio area (this report) and just over 500 individuals in the Wayana area (Heemskerk, Delvoye, Noordam and Teunissen, 2006)

[8] Possible explanations for the figure are that many indigenous households were left out of the 2005 census; that Indigenous families answered falsely; or that the census takers did not understand the answers and hence categorized them as 'unknown' – a group covering 2.5 percent of households.

possibly as much as 20% of employment or more. Small-scale gold mining provides subsistence to several thousands Brazilians and Maroons. Typically performed informally and illegally, small-scale mining carries the economy in a large share of the forested interior. Additional industries include lumbering and plywood manufacturing (largely exploited by Asian companies) and the manufacture of molasses and rum. Industries contribute approximately one fifth of the Gross Domestic Product (22%).

Agriculture, forestry, and fisheries accounted for more than 13 percent of GDP in 2005. Another important source of national income is bi-lateral development aid. The government is among the largest employers, accounting for almost 18 percent of formal employment[9]. Much employment in Suriname, however, is informal, meaning that it occurs outside of national regulations and is unrecorded in national statistics. According to the General Bureau of Statistics (ABS), the informal economy contributes about 20.2% to real GDP. In addition, many Suriname households receive remittances in the form of cash money and products (est. one fifth of formal imports) from family in the Netherlands.

Today, as compared to the citizens in other Caribbean countries, Surinamers are relatively well off with a per capita Gross National Income of US$ 2,230 and a real GDP growth of 4.6 percent (Table 3.2). This recorded value is likely an underestimate as it excludes earnings from informal gold mining and trade, other informal activities, remittances, subsistence agriculture, drugs money, and other unrecorded sources of income.

Yet incomes are not evenly distributed. A 2001 survey by the national bureau of statistics estimated that 66 percent of the (sub)urban population was living below the poverty line. Nine and a half percent of the population is unemployed[10]. Unemployment is particularly high among youth (15-19 years of age), of whom more than a quarter (26.7%) is unemployed. The district of Sipaliwini, which covers the vast interior of the country, has with 20.7 the highest unemployment rate in the country. A fifth of Suriname households (20.1 %) are headed by single women – usually single mothers- who tend to be among the most vulnerable and poorest groups in society.

Most of Suriname's infrastructure is concentrated in the coastal zone. The main national road is the East-West connection which, as the name suggests, runs from the border with French Guiana in the East to the border with Guyana in the West.

3.1.4 Politics

The Republic of Suriname is a constitutional democracy, by the constitution of 1987. The different branches of the government (National Assembly, President, Vice-president, and Ministers) are simultaneously elected for a five-year term. A State Advisory Council with 15 representatives from the elected parties, the unions, and employers' organizations,

[9] ABS 2005b: 40

[10] This figure indicates the people in the economically active age (between 15 and 64) who do not work and had actively sought for a job in the 4 weeks prior to the census. The total share of people in the economically active age who do not work amounts to 14.7 percent of the population (ABS 2005).

advices the president in policy matters. Suriname knows universal suffrage for all citizens over the age of 18.

After Suriname gained independence from the Netherlands in 1975, the country experienced a brief period of political instability. Military dictatorship (1980-1987 and 1990-1991) and six years of armed conflict in the interior (1986-1992) severely restricted political freedom. After return to democracy in 1992, Suriname has featured free and democratic elections, and freedom of press. Notwithstanding these positive trends, corruption and nepotism continue to affect political decision-making and spending.

3.2 Trio Territory

3.2.1 Trio Peoples in the larger Amazon basin

Geographically, the Trio, also named Tiriyó (Brazil) and Tarëno, live in a large area in the northern Amazon Region on both sides of the Suriname-Brazil border. Geographically, the Trio-area may be subdivided in three drainage basins separated by mountains, each basin having its main village (Teunissen and Noordam 2003).

In Brazil:

- the Paru River basin in Brazil with the main village of Missão Tiriyó.

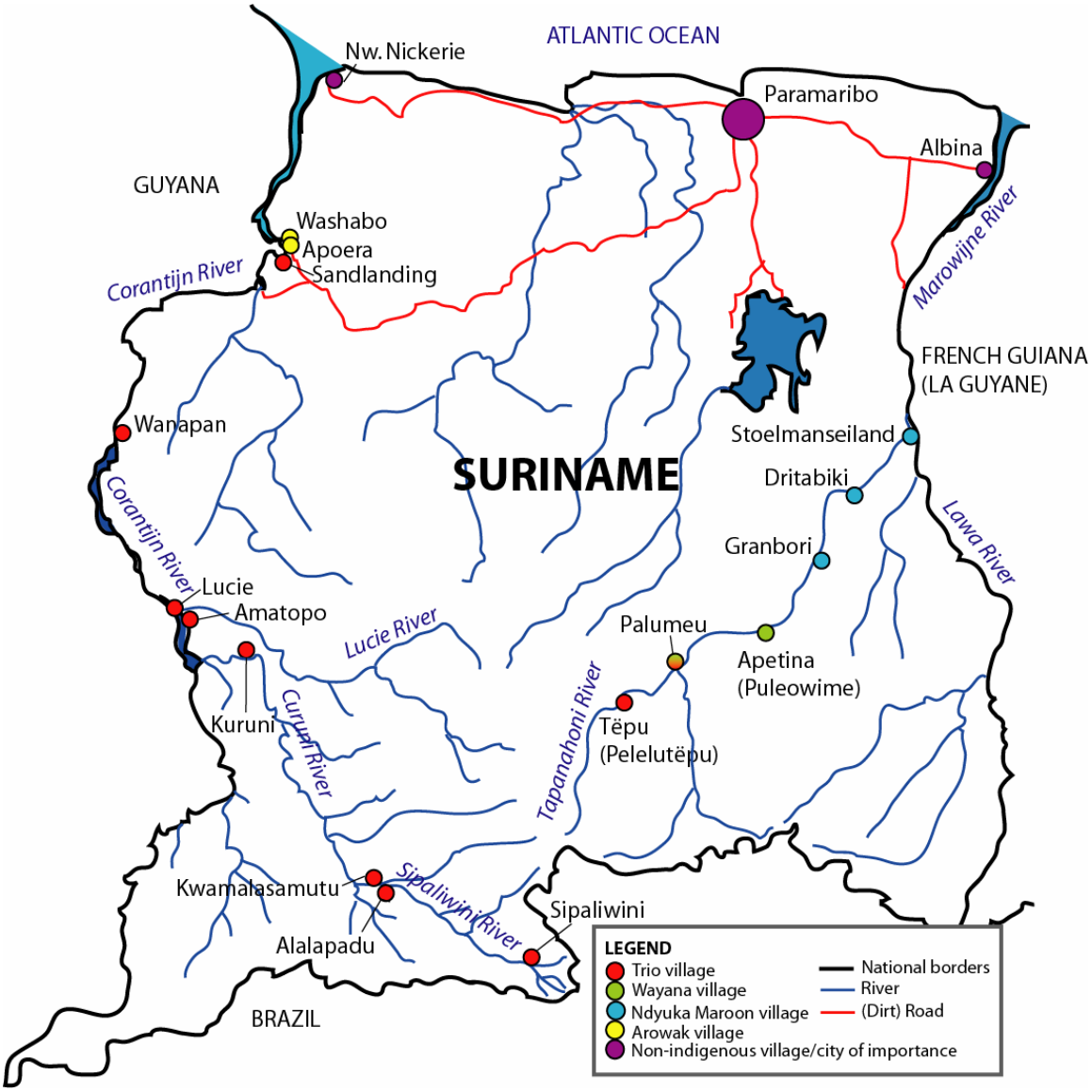
In Suriname:

- the Upper Sipaliwini-Corantijn River basin with the main village of Kwamalasamutu
- the Tapanahoni-Palumeu River basin with the main village of Tëpu (also known as PeleluTëpu).

3.2.2 Trio communities in Suriname

In Suriname, the Trio inhabit the shores of the Corantijn, Sipaliwini, Kuruni, and upper-Tapanahoni Rivers (Figure 3.2).

Figure 3.2. Suriname with the present Trio communities, nearby communities of other indigenous and tribal groups, and cities of national importance



Source: Drawn by M. Heemskerk, based on NARENA map of villages (2005) and Teunissen and Noordam (2003; Figure 2)

By far the largest Trio community is Kwamalasamutu; almost half of all Suriname Trio live here. As we will explain more extensively in the next chapter, Kwamalasamutu was selected by US Baptist missionaries as a location to gather all Trios from the Corantijn/Sipaliwini River basin. Concentration facilitated the delivery of health care and

(missionary-style) education as well as evangelizing of the Trio by the missionaries. The second Trio village in size is Pelelutëpu, better known under its abbreviation Tëpu, situated on the Tapanahoni River. After Alalapadu, which was fist established around 1961-1962, Tëpu is the oldest populated Trio community in Suriname. Alalapadu was abandoned in the 1970s, but has been re-occupied by the Trio since 1999.

As we will explain in the following chapter, in the 1960s and 1970s the Trio began to concentrate in a few large missionary engineered population enclaves. In the past decade, Trio Granman Asongo Alalaparu has been encouraging his people to disperse again over a larger area. He has sent several of his Kapiteins with their extended families to strategically located villages that mark the boundaries of the Trio territory: to Wanapan (1998) - also named Arapahtë pata after its Kapitein and main family head-, to Alalapadu (1999), to Sipaliwini (2000), to Kuruni (± 2001-2), to Kasuelen (Guyana; ± 2002), to Amotopo (2003), and to Lucie (2004). Some of these places, such as Alalapadu, are old Trio settlements that either had been abandoned or had only a few people left. Others, such as Wanapan and Kuruni, are places where the Dutch colonial government was present in the 1960's and 1970's. Old cement floors, dilapidated urban-style houses, and broken vehicles remind us of research and monitoring activities by the Bureau for Hydraulic Works (Bureau Waterkrachtwerken, BWKW), the Meteorological Service, and the Geology and Mining Department (Geologisch Mijnbouwkundige Dienst, GMD).

Figure 3.3 Remains of the blooming period of Suriname's governmental departments such as the BWKW, GMD, and Meteorological Service

Pick-ups used to drive to Wanapan, where this one was left behind.

Urban-style house abandoned by the Aviation Service, now occupied by Trio in Kuruni

Four decades ago heavy equipment drove to Amotopo, to be put at work.

One reason for dispersal is that the large population in Kwamalasamutu is exhausting the natural resources base in the village's immediate surroundings. Hunters now have to travel further distances to find game; fish is becoming sparser; and agricultural fields are cut further from the village and re-used without obeying the appropriate fallow time. Moving people to different locations will relieve pressure on these resources. Another reason for dispersal is to re-claim the traditional Trio lands in support of territorial claims.

In addition to the mentioned villages, three significant communities of Trio peoples live outside what are considered the Trio traditional home-lands. Firstly, the village of Palumeu is a mixed Trio-Wayana community. Even thought the majority of the

population and the Kapitein of Palumeu are Trio, both groups consider Palumeu to be situated on Wayana territories. Secondly, in the late 1990s a small Trio community named Sandlanding was established on Arowak customary lands, bordering the village of Apoera. And finally, a couple of Trio individuals and families have settled in the capital city of Paramaribo in search for better access to education and employment. Their numbers are growing as living conditions in the interior are worsening and increased contact with the city increases desires and expectations about urban living. As this report focuses on the interior, this latter group will not be discussed extensively. Figure 3.2 shows the location of the villages where the present-day Trio live.

3.3.3 Territorial rights and frontiers

Even though the Trio have lived on and used the lands they currently occupy for several centuries, they have neither private nor communal titles to these lands. Under the Suriname constitution, all land to which no-one can prove ownership is considered State-land. This includes all land in the interior where the Indigenous Peoples and Maroons live. Specific laws, such as the Forestry Law of 1992, demand that the customary rights of interior populations living in tribal communities are taken into account if the resources in an area where these people live are being exploited by third parties. However, the law does not provide measures for the protection of these rights nor define procedures for consultation, compensation, and appeal. Where these procedures have been commented upon, they either are vague or do not function in reality. The ACT reports about rights to land and resources for Suriname's Indigenous peoples and Maroons in general in general (ACT 2005), and about the legal context of these rights specifically (ACT 2006a), provide more extensive analyses of this matter.

As Suriname's forest peoples have no formal land rights, the borders of their territories are not legally demarcated. Nevertheless, Indigenous Peoples and Maroons themselves have a fairly clear understanding of what area belongs to what group and these invisible borders are generally respected by the members of the various tribal groups.

National borders, on the other hand, are of little relevance to the Trio. They cross the border of Suriname and Brazil freely to visit relatives, go on hunting expeditions, and collect forest products. The Trio do not need legal documents (passports or ID cards) during these trips across national borders. Due to the tense relationship between the Suriname and Guyanese governments in matters concerning the contested area, crossing the Corantijn River into Guyana is more problematic. Guyanese military posts along the river guard the border against the entry of Suriname citizens –whether or not indigenous. Among others, they have prohibited the Trio to cut timber on the Guyanese side of the border. The inhabitants of Wanapan also complained that the militaries recently told them they were no longer allowed to use the footpath along the Wonotobo falls, which lies partly on Guyanese territory. The Trio rely on this trail over land on boot-trips between the Southern-most villages (e.g. Amotopo, Kuruni) and the coastal area, to avoid navigating the dangerous rapids by canoe.

CHAPTER 4
HISTORY OF TRIO SETTLEMENT IN SURINAME[11]

This chapter provides an overview of the history of the Southern indigenous peoples in Suriname, starting with the earliest human presence in the Sipaliwini savanna. We first describe the development of Amazon indigenous peoples from nomadic hunter-gatherer groups to semi-sedentary societies in pre-Columbian times. Next we focus on the colonial period, emphasizing the dramatic chances in Trio society following contact with explorers and missionaries, and later due to Suriname's interior war. The last section in this chapter focuses on acculturation and change in the past two decades, a theme that will repetitively return in subsequent chapters.

4.1 The first Indigenous populations in Suriname, ± 8,000 – 4,000 BC.

Figure 4.1 The Sipaliwini Savanna in South Suriname is evidence of early human fire management. Notice the border with troika rainforest on the right

People arrived in the Guianas approximately 10,000 years ago (Versteeg 2003). These earliest inhabitants lived primarily in the savannas, attracted by the presence of game animals and the stone materials they needed to make their spear and arrow heads, knives, and other tools. Large, continuous savannas existed during the relatively dry climate of the last ice-age (+ 100,000 – 10,000 B.C.). Increasing atmospheric humidity after the ice-age would have transformed all these open areas into tropical forest were it not for human intervention; people used the combustibility of the area to create a landscape that facilitated hunting and access (Figure 4.1).

The Sipaliwini savanna is also the place where the oldest evidence of human occupation in Suriname has been found. Archeological finds of stone tools such as arrow and spear heads, fist axes, and knives, suggest the presence of hunter-gatherers that lived here about 10.000 to 7.000 years ago. These early Indigenous populations were probably hunters of extinct large game; the Pleistocene fauna such as mammoths and mastodons. Later populations hunted smaller game such as birds, monkeys, sloth, deer, tapir, peccaries, armadillos, ant eaters, rodents, and agoutis. In addition, they caught fish and other aquatic

[11] This historic account is largely based upon the research of Karin Boven (2001) and C. Koelewijn and P. Rivière (1987) , who have used archival information and oral histories to reconstruct the history of the Trio in Suriname. Other relevant sources include the Wayana Baseline Study (ACT 2007), an earlier ACT report about Kwamalasamutu (ACT 2005), and the archeological work of Versteeg (2003).

resources and collected a variety of wild plants. We do not know whether these prehistoric nomadic Indigenous Peoples were (related to) the ancestors of the Trio.

There are no archeological records from approximately 5,000 to 2,000 BC. Notwithstanding, archeologists believe that Suriname remained inhabited during this time given the preservation of the savanna landscape, which requires regular burning. Limited numbers and continuous movement minimized the impact of prehistoric Indigenous Peoples on the forest and local wild life populations.

4.2 The development of early tropical forest cultures, ± 4000 BC – 1600 AD

Around 4,000 BC developed what Suriname archeologist Versteeg (2003) calls the 'typical South American Tropical Forest Culture' on the banks of the Amazon River. This culture organized around agriculture, and probably moved into Suriname from the Venezuelan Orinoco region, about 3,000 years ago. In addition to cassava (*Manihot utilissima*), the main staple crop, forest gardens contained a wide variety of tubers, vegetables, and fruits. In addition, hunting, fishing, and gathering remained important sources of food, medicine, tools, and other materials.

Pottery finds suggest the existence of different ethnic groups or cultures in Central and South Suriname around this time. Also petroglyphs have been found in and near places currently populated by Trios, for example at Werephai near the Trio village of Kwamalasamutu, and along the Corantijn river, among others near the Trio village of Wanapan. Neither the Trio nor archeologists know who made these and other petroglyphs in Suriname.

Figure 4.2 Petroglyph in/on the shores of the Corantijn River.

4.3 Trio settlement in South Suriname

According to their oral histories, the first large Trio village was the 17th century village of Samuwaka. This community was situated on the Sipaliwini savanna just south of the current border of Suriname with Brazil, and stretched out over several kilometers along a creek branching off the Western Paru River. It is possible that the several different tribes that went to live together in Samuwaka then first named themselves 'Trio/Tiryo' or 'Tarëno'. Living with a large population on one location was not sustainable. Moreover, the large settlement was difficult to defend against enemy attacks. As game and other forest resources were becoming sparse the Trio people left Samuwaka and dispersed to the Palumeu, the Tapanahoni, and other Rivers in South Suriname and North Brazil.

Their track from Samuwaka was not the first or the last time that the Trio and other peoples had gathered and dispersed. In the 16th and 17th centuries thousands of small indigenous tribes were living a (semi)nomadic life in the larger Amazon rainforest. These groups formed larger associations when this was favorable for warfare, hunting, or other reasons, and dispersed again following internal conflicts or resources scarcity. The larger conglomerates of tribes sometimes took on the name of the dominant tribe, which 'adopted' the smaller sections. On other occasions, the different groups maintained their own name and identity.

4.4 Early colonial period, 1600-1700 AD

When Europeans set foot on land in the Guianas by the end of the 16th century, an estimated 60,000 to 70,000 Indigenous people were living in the area that covers current Suriname. Warfare, slavery, and above all Western diseases decimated their populations soon after foreign occupation. Most lowland Indigenous groups eventually made peace with the colonial government and established communities at the river mouths and along the beaches.

Highland indigenous peoples were mostly ignored by the European invaders and had little contact with the coast. They only made occasional trips southward to trade with the Maroons - runaway African plantation slaves and their descendents, who established independent communities in the rainforest in the 17th and 18th centuries. According to the Trio, they had been living along the Tapanahoni before the Maroons settled here. Reports from early explorers and archeological excavations confirm that the Suriname highlands were inhabited by indigenous peoples prior to the arrival of Maroons, but we do not know for sure whether these peoples were Trios.

Trio oral histories tell that the Trio left this area out of fear for the white people, the *pananakiri*. Upon their return to the Tapanahoni River some years later they encounter the Ndyuka Maroons. The two tribes established trade relationships, where the Trio trade hunting dogs for salt, sugar, and iron tools. The Trio left the Tapanahoni again, however, possibly because the Ndyuka infected them with deadly diseases and dominated the trading relationship. Among others, the Trio settled along the upper Paloemeu River.

4.6 1796-1950s: Meeting European explorers

In the 18th century, the Dutch colonial government began to make an effort to increase grip on Southern Suriname and its indigenous inhabitants. A report to the governor dating from 1796 first mentions 'a kind of Akoli's[12] named Trios'.

After the first few encounters of the Trio with Europeans, many years follow without or with very few contacts - in part because the Trio avoid them. In the early 20th century the Dutch undertake several expeditions to the interior. The Tumakhumak expedition led by

[12] A name probably derived from the Akoerio's, then used to refer to all Southern Indigenous groups.

the geographer C.H. De Goeje is among the first to enter the Trio living territories. A few years later, in 1910-11, Vice-admiral C.C. Kayser leads an expedition up the Corantijn River. Between 1915 and 1938 various other Dutch, American and Brazilian expeditions travel through Trio lands but they did not have much contact with the Trio.

In 1940, the Surinamer Lodewijk Schmidt begins a three year-long survey of the Trio and Wayana villages. He travels through practically the entire Trio area in Suriname and Brazil, visiting 20 out of the 25 Trio villages he registers. These villages numbered, on average, 27 persons and were all connected by foot-paths. Schmidt records that the Trio are still tracking southward out of fear for tuberculosis. After Schmidt, various other expeditions visit the Trio. In 1952, their reports motivate a medical expedition to fight a flu epidemic among the Suriname Trio. Apart from these occasional encounters, the highland Indigenous groups continued to have little contact with Western people. For products from the coast they rely on trade with the Maroons.

4.6 Organization grasshopper and missionary activity

The year 1959 the Dutch colonial government initiated Operation Grasshopper. The purpose of this program was to make the interior more accessible by cutting seven airstrips at strategic points. The first airstrips in South Suriname were prepared in the Sipaliwini savanna and on the shores of the Tapanahoni River, facing the mouth of the Palumeu River.

More impact than these government steered developments had the arrival of the US-based ‘Door to Life Gospel Ministries’, headed by Claude Levitt, in 1960. Levitt first visited the village of Aro in the Kïtojoi savanna (Sipaliwini River basin). Evangelizing activities started in 1961. The Trios initially were afraid of the airplane and the missionaries. A Waiwai named Japuma, who had come from Guyana and was familiar with airplanes, brought the missionaries to the Trio. When the Trios saw that Japuma was not afraid, they also opened up for contact.

In 1962, the ‘Door-to-Life’ organization was taken over by the West-Indies Mission. In Suriname this organization was operating under the name Suriname Interior Fellowship and, since 1978, the Worldteam. Throughout the 1960s missionary activities continued in and around the village of Alalapadu (Alalapadu) on the upper Kuruni (Wiumi) Creek. At this latter location, a side branch of the Sipaliwini River, another airstrip was cut. The Baptists also established themselves in the village of Palumeu along the Tapanahoni River.

The missionaries persuaded Indigenous groups to abandon their semi-sedentary lifestyle and concentrate in a few larger population enclaves with mission posts in order to facilitate baptism, as well as access to health care and education. By 1963 all Trio families from the Sipaliwini river basin had moved to Alalapadu. Meanwhile the mission post at Palumeu has attracted all Trios living in the near surroundings, including the Trio living along the upper Tapanahoni and eastern Paru Rivers. Migration from small

settlements in Suriname and Brazil to Alalapadu continued following years. Around 1966, several Trio families from the village of Palumeu moved to the newly created village of Tëpu, located at a few days paddling stream upward along the Tapanahoni River. The missionaries accompanied them and built an airstrip on this location.

The natural environment of Alalapadu cannot sustain the large population flocking to this village. In the dry season the river falls almost dry and people cannot find enough fish, increasing dependency on game – which also became scarcer. Around 1975, the missionaries and all inhabitants from Alalapadu moved to Kwamalasamutu, which rapidly became the largest Trio community – which it still is today.

4.6 The interior war

At the same time that resettlement schemes, evangelization and acculturation dramatically changed the lives of the Trio, the coastal area also experienced major transitions. In 1975, Suriname gained independence from the Netherlands. The political and economic instability that followed independence led in 1980 to a military coup led by army Sgt. Bouterse. The Suriname population initially welcomed the coup and a change from the old politicians' incapacity to uplift the country. Yet as military control on people's personal lives tightened and human rights abuses increased, support for the military regime rapidly dwindled.

In 1986 widespread social discontent with the political status quo and a personal conflict between Bouterse and his former bodyguard Brunswijk led to a civil conflict known as the interior war. The main combatants in this armed conflict were Bouterse's military government and a group of Maroons headed by Brunswijk called the Jungle Command. Later a group of coastal Indigenous peoples, armed and trained by the military regime, joined the conflict under the name Tukajana Amazonas.

For long the Trio did not participate in the conflict. They became directly involved when Bouterse sent weapons and militaries to Tëpu to train the Trio as a military regiment in the interior. This occurred on the invitation of the local authorities,. In 1991 the situation escalated when the Jungle Command found out and invaded the village. No-one was killed during this operation, but militia-members were disarmed and beat up. The guerilla invasion motivated many Tëpu Trio to seek a safe haven in Brazil. To date the majority of these refugees have not returned.

In 1991-1992 peace treaties ended the armed conflict. Even though the fighting had concentrated on East-Suriname, the entire interior had been affected due to its sudden isolation from the city, the destruction of infrastructure on strategic locations, and the departure of foreign development workers, nurses, and teachers. Even today, in 2007, the damage caused by the war continues to affect the daily lives of people from the interior. Children who were unable to attend school during the conflict are currently unable to compete for jobs with their peers from the urban area. Also, much of the infrastructure that was destroyed or abandoned during the interior war has never been repaired.

4.7 Acculturation and change

The radical transitions of the past four decades have had many advantages: better health care, a substantial increase in life expectancy, western education and literacy. As a result, the population of highland indigenous peoples began to recover and has grown ever since.

Yet acculturation also has had negative effects on the local culture, environment, and household economy. As traditional cultural expressions were renounced, the young generation of Trios is left with very little traditional knowledge of its (mythical) history, spiritual stories, medical plants and healing practices, and forest management. Secondly, traditional subsistence activities are sustainable for small family groups that relocate every so-many year when local resources begin to deplete. The carrying capacity of the rainforest, however, may not be able to absorb the impacts of hunting, gathering, and planting by the large population concentrations of today. As a result Trio families in the largest communities need to travel larger distances to find suitable agricultural land and wild life than before. The related necessity for outboard motors and gasoline has increased the costs of every-day life.

A growing local dependency on western manufactured goods is further accelerating the need to earn cash money. Income generation activities are rare, however, and many families are struggling to maintain a desirable standard of living. To earn money Trios mostly rely on forest resources and limited wage labor opportunities (See Chapters 5 and 8). The over-extraction of wildlife, particularly birds, has further intensified pressure on the natural environment. A possible alternative income source could be (eco)tourism, which is developing in and around the villages of Kwamalasamutu, Wanapan, and Amotopo. To date, however, Trios have not managed to earn more than a few dollars for crafts, let alone a living, though this activity.

Finally, with the greater integration of the Trio community into the national society the Trio also have adopted typical urban problems such as petty crime, drugs use, prostitution, and fraud. The Trio traditional authorities are faced with the challenge to steer the development of their communities in directions that allow for the absorption of positive elements -e.g. modern education, health care, electivity- while preventing negative elements to germinate. The biophysical, socioeconomic, and cultural contexts in which these challenges are being met are described in more detail in subsequent chapters.

CHAPTER 5
NATURAL CAPITAL

This chapter describes the natural environment and resources that provide the home and subsistence base for the Suriname Trio. It begins with a brief characterization of the geology and geomorphology of the area, followed by the climate, hydrology, and the diversified vegetation within the Trio lands. The ensuing sections deal with wild plants (sect. 5.5) and animals (sect.5.6), inclusive their commercial and subsistence uses. Section 5.7 covers endemic, rare and threatened species followed by 5.8 which deals with the protected areas established in the Trio area. This part is then followed by assessments of Trio agriculture (sect. 5.9), including practices; crops on cultivation fields and in villages; and pests. The chapter continues with an evaluation on animal husbandry (sect. 5.10) and concludes with an opinion of ecological understanding in contemporary Trio communities (sect. 5.11).

5.1 Geology and geomorphology

Geologically, Suriname can be divided into a shield area and a coastal plain.
The shield area covers more than 80% of the country and forms a part of the Precambrian Guiana Shield, which stretches between the Orinoco and Amazon rivers and includes eastern Venezuela, Guyana, Suriname, French Guyana and northern Brazil. This part of the interior of Suriname was formed during the Trans Amazonian mountain formation, 1.8-2.0 billion years ago. The crystalline basement of Suriname consists essentially of two high-grade metamorphic belts of possibly Archean and Lower Proterozoic age (the Falawatra and Coeroeni Groups), a Lower Proterozoic greenstone belt (Marowijne Supergroup), and a vast Lower Proterozic granitoid volcanic complex. It carries a few remnants of a once extensive cover of flat-lying, Middle Proterozoic continental sediments (Roraima Supergroup), and is cut by abundant Precambrian and Permo-Triassic dolerite dikes (Gibbs and Barron, 1993).

The coastal plain, which is about 40 km wide at the eastern border with French Guyana and about 120 km wide at the western border with Guyana, consists of sediments grouped in the Corantijn Group. The total thickness of the Group increases from south to north and from east to west. At the mouth of the Marowijne River the thickness is barely 200 m but in the vicinity of Nieuw-Nickerie at the mouth of the Corantijn River the thickness is nearly 2000 m (Wong, 1986; Wong, 1989). The Group rests unconformable on the weathered rocks of the Precambrian Guiana Shield.

Concerning the geomorphology of Surinam it could be summarized that the surface of the Guiana Shield has been shaped during billion of years of tectonic movements, weathering, denudation and deposition under a range of different climates. It can thus be characterized as a landscape of very old age (Teunissen & Noordam, 2003).

Concerning the geology / geomorphology of the Trio living area, following remarks should be added:

Rocks of the Trans Amazonian granoit-volcanic complex occupy the majority of the study area.
The oldest rocks are those of the Kuruni-Lucie area, situated in the upper Corantijn basin. High-grade metamorphic and partly migmatitic rocks cover this part, which have been designated as the Coeroeni-Group (Kroonenberg, 1976).
The upper Corantijn basin is an extensive, slightly dissected lowland between 150 and 250 m above sea-level, with occasionally higher laterite capped hills and granite tops. In the northeast and east the impressive Wilhelmina Mountains and Kayser Mountains abruptly rise from the surrounding lowland, attaining heights of respectively 1280 and 861 m.
The Sipaliwini area is underlain predominantly by volcanic and granitoid rocks. Well stratified acid to intermediate volcanic rocks occurs in a broad zone from North West to South East (Maas & van der Lingen, 1975).

In the Trio area, explorations have revealed valuable deposits of gold, bauxite, iron, copper, diamond, manganese, tin, kaolin, quartz sand and crystals. However, except for bauxite and gold, no economically feasible quantities have been found (Teunissen & Noordam, 2003).

It is documented that in the past, indigenous people have used stones and minerals for the manufacturing of a.o. cutting tools, rubbing, ornaments and spear heads but nowadays most stone implements have been replaced by iron substitutes.

Landscape characteristics have always played an important role in the choice of the Trio's settlements and their selection of suitable land for shifting cultivation areas in which low plateau and hill land are preferred.

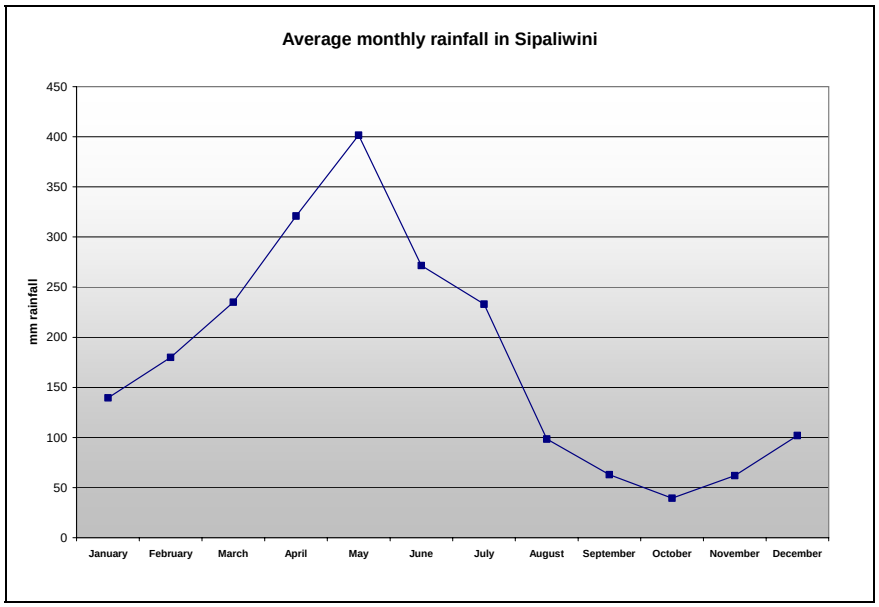
5.2 Climate

rainfall - daily air temperatures - relative humidity - daily sunshine - wind speeds

Suriname has a humid tropical climate. According to Köppen's classification, the major part of the country has a Tropical Rainforest (Af) or a Tropical Monsoon Climate (Am). In the parts with these climate types, four seasons are distinguished, based upon rainfall distribution (Scherpenzeel, 1977). A short dry season; from early February to the end of April is followed by a long rainy season, till mid August. Then a long dry season sets in until early December followed by a short rainy season from early December till early February.
The study area has a Wet and Dry climate (Aw) with only one rainy and one dry season and is therefore different from the climate of the majority of Suriname.
Meteorological data (such as rainfall, temperature, relative humidity, day length, sunshine hours and wind speed) for the Trio area were obtained at the National Meteorological Service, having permanent stations in Kuruni, Sipaliwini and Kwamalasamutu. The obtained data, recorded since 1960 (Kuruni), 1961 (Sipaliwini) and 1977

(Kwamalasamutu) were not always complete but is believed to give sufficient information for the purpose of this study.
Of the various data that determine the climate of the Trio area, rainfall shows the greatest variability during the year and is therefore the most decisive factor. The rainy season starts in January and ends around July/August. The dry season covers the remaining months. The average annual rainfall ranges between 39.5 mm (October) and 401.5 mm (May). Most data was obtained for Sipaliwini, where a permanent employee of the Meteorological service is stationed. The graph represented in figure 5.1 corresponds with the monthly averages for the precipitation in Sipaliwini and shows the two-seasonal character of the rainfall.

Figure 5.1 Average monthly rainfalls in Sipaliwini



Some years are dryer or wetter than others. Especially during those deviating years, rainfall disturbs Trio's daily lives even more than normal. Extremely dry or wet periods lead to lower crop yield resulting in decreased food-supply for the Trio community.

Temperature data were obtained for the Sipaliwini station only. Average daily air temperatures in this village range between 26.0 ºC for January till 28.2 ºC for October.

Relative humidity closely follows the seasons, with the highest daily humidity in the rainy season (around 80%) and the lowest in the dry season (around 72% except in Sipaliwini where it decreases below 65% in this season).

For this study, there was no recent information obtained on day length, sunshine hours and wind speed. Teunissen & Noordam give following descriptions for those parameters in their ecological survey in the lands used/inhabited by the Trio (ACT, 2003):
From December to June the average daily sunshine is lowest, when it is around 6 hours. In July the sunshine hours start to increase towards the months of September and October,

which are the sunniest months with an average of approx. 8-9 hours of sunshine/day, after which it decreases again.
The average duration of sunshine does reflect the rainfall distribution pattern. From December to June the average daily sunshine is lowest, when it is around 6 hours. In July the sunshine hours start to increase towards the months of September and October, which are the sunniest months with an average of approx. 8-9 hours of sunshine/day, after which it decreases again.
Average wind speeds are low (1.7 m/s for Kwamalasamutu) to very low (0.6-0.8 m/s for the other stations). During the night and early morning it is usually calm. During the day the wind speed may increase to about 5 m/s, and in some seasons to 5-8 m/s. Southern Suriname has an east-southeast wind direction for most of the year, except for the early rainy season, when winds come from an east-northeast direction. Wind speeds of 20-30 m/s have been occasionally recorded during thunderstorms, but only for a very short period (locally known as 'sibibusi'). Suriname is free of hurricanes.

5.3 Hydrology

The studied Trio-area includes two drainage basins:

- The Corantijn (Tr: Kuritono) drainage basin with as main tributaries the Lucie River (Tr: Totopo eeku), the Kuruni River (Tr: Kuruni) and the Sipaliwini River (Tr: Sipaliwini).
  Separated by the Eilerts de Haan Mountains from:
- The Upper Tapanahoni (Tr: Taponani) drainage basin with as main tributary the Palumeu (Tr: Palumo).

With its 67,600 km^2, the Corantijn represents the River basin with the second largest surface in Suriname and the second largest average discharge (1771 m^3/s). The Tapanahoni River is a tributary of the Marowijne River, which forms the Eastern border of the country. The Marowijne River is the largest river by volume, it has a basin with a surface of 68,700 km^2 and an average discharge of 1791 m^3/s (source: Suriname Planatlas, 1988).
Because dry seasons in the Trio area can last for six months, the water level may become so low, that exposed rocks and sand banks makes navigation very difficult and time consuming.
In the Sipaliwini settlement, villagers indicate the months of October and November as those when the nearby Sipaliwini River is nearly impossible to navigate. Traveling to Kwamalasamutu, hunting activities and recent developed tourism activities from Sipaliwini to the Vier Gebroeders Mountain (Tr: Mamija) are interrupted during this period. This is also applicable for Kwamalasamutu and its tourist attraction of Werehpai.

Years with extreme high rainfall, for example the last two years (2006/2007), resulted in flooding of some shifting cultivation areas, camps and lower parts of villages. Badly drained fields form a problem for the agricultural plots.

5.3.1 Water use and water quality

Water use

Waterways in the proximity of the settlements are crucial for the Trio's daily life activities such as:

- **Navigation**:
  The Corantijn River is used by the Trio from Sandlanding to go to Washabo, Apura or sometimes Nieuw-Nickerie. About once a month, the first 250 km of the Corantijn stream are utilized upwards to reach Wanapan (Wonotobo falls). The upper Corantijn, connecting the Trio villages Lucie, Amotopo and Kuruni, is mainly used for hunting and fishing trips.
  The Sipaliwini River connects Kwamalasamutu and the village at Sipaliwini. This river is also used for traveling to relatives and friends in Missão or in Kuusare (both in Brazil, the last part of the trip goes overland).
  The Wiumi / Kuruni Creek is used by the Trio from Kwamalasamutu to reach the village of Araraparu where hundreds of Brazil nut trees (Tr: tuhka) are concentrated in a Brazil nut forest.
  The upper Tapanahoni river (Tr: Taponani) between Tëpu (Tr: Përërutepu) and Palumeu (Tr: Paruma) connects the two communities and is also used for hunting and fishing trips. This river has also an important navigation function to bring tourists to the Kasikasima mountains (Tr: Tipëriken).

- **Fishing/hunting**:
  All nearby rivers and creeks comes into consideration for fishing and hunting activities and are used on a daily basis for that purpose. On the land use and land protection map of the Trio people, available at the ACT-Suriname office, dozens of good fishing spots are marked.

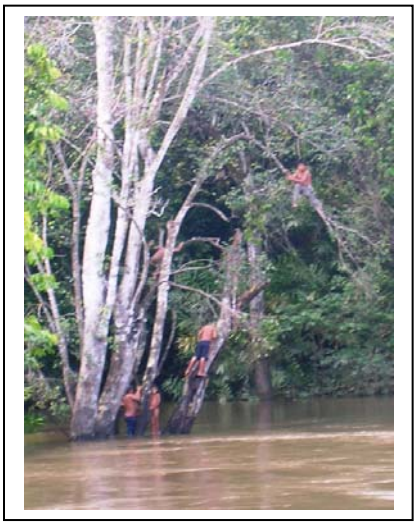


Fig 5.2: recreation spot

- **Washing, bathing and recreation**:
  Rivers or creeks are used each day for bathing and washing laundry and dishes. Children use exposed rocks and low hanging branches as a recreation spot (fig 5.2). It is expected that the increasing ecotourism in the area will make that existing streams are used more frequently.

- **Drinking water**:
  In all villages except for Kwamalasamutu, rain water is collected and used as drinking water during rainy seasons. During dry seasons (boiled) river water is

used for that purpose. With the support of ACT, a water system is being constructed in Kwamalasamutu to pipe water from the village's water well to several distribution points.

Water quality

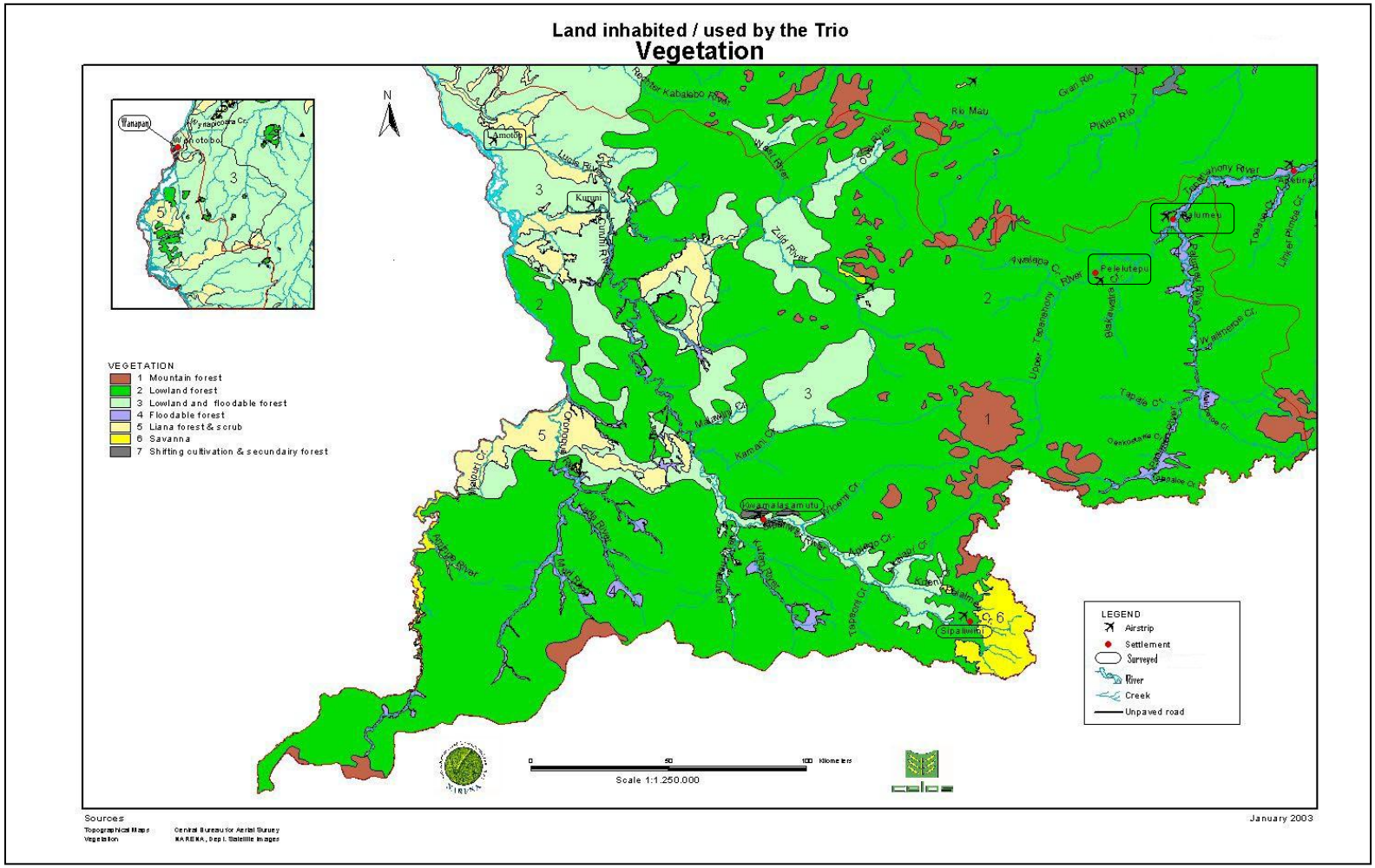
At 5 (five) Trio settlements on the Corantijn Bassin[13] seven basic water quality parameters were measured with a basic water monitoring kit[14]. During the field trips, the nearby river/creek was tested on the following:
a) Water temperature, b) Turbidity, c) pH, d) Dissolved Oxygen, e) Nitrate, f) Phosphate and g) Total Coliform bacteria.

Nearly all test results revealed a good or excellent water quality. Results can be found in annex IV and can be summarized as follows:
Water temperature, that affects the amount of dissolved oxygen, the rate of photosynthesis by aquatic plants and the sensitivity of organisms to toxics, parasites and diseases, varied between 26 ºC and 29ºC. The *turbidity* measurements revealed good (Sipaliwini) or excellent results for the entire Corantijn bassin.
The measurements of the acidic or basic quality of water (*pH*) remained nearly constant. At all sites, except Kuruni, investigated *dissolved oxygen* tests revealed a high or extremely high (Wanapan) saturation, moreover due to the aerating effect of present rapids and falls (Wonotobo falls at Wanapan). No measurable amounts of *nitrate* and a small amount of *phosphate* (0-2 ppm) were present.
There were positive[15] test results of *coliform bacteria* at all examined spots, but further research is necessary to determine if pathogens are present. Coliform bacteria are commonly found in the environment and are generally harmless, but if fecal coliform (a sub group of total coliform with a greater possibility of pathogens) is present, a health hazard risk can exist.

It must be underlined that the resulting information is only a basic snapshot and monitoring should be repeated to reach a more scientific value. However, the results added in annex IV can be considered sufficient for the purpose of this study and must be seen as first indication of the current water quality of the Corantijn basin.

[13] Sandlanding, Wanapan, Amotopo, Kuruni and Sipaliwini
[14] Water monitoring kit from GREEN (Global Rivers Environmental Education Network)
[15] Indicates more than 20 total coliform colonies per 100 ml

Figure 5.3: Main vegetation types for the Trio area
Map based on Teunissen and Noordam, ACT 2003



5.4 Vegetation

The map presented in figure 5.3 (NARENA 2003), that is mainly based on interpretation of satellite images, shows the six main vegetation types that cover the land inhabited/used by the Trio's. These six main vegetations are:

- *Mountain forest,* present at the altitudes above 500 m;
- *lowland forest,* dominates the vegetation in the Trio-area;
- *floodable forest*, common along the present rivers and creeks;
- *liana forest,* mainly occurs on the west side of study area;
- *savanna related vegetation,* covers the Sipaliwini Savanna in the south of the area and
- *secondary forest*, found in the proximity of the Trio villages due to shifting cultivation or other activities in the Trio area such as open mining.

These six vegetation types are described below.

5.4.1 Mountain forest

Mountain forest is found at altitudes over 500 m above sea level (SPA, 1988). Except from lower temperatures, it is the higher humidity and the distribution of a higher rainfall throughout the year that determines the plant formation. The high humidity is favorable for the development of a large range of ferns and epiphytes such as bromeliads and orchids that cover the mossy trees. The mountain forests cover about 5 % of the Trio area and prosper at the southern border of Suriname on the Akarai Mountains, to the North of the Sipaliwini savanna on the Eilerts the Haan Mountains and on the Bakhuis Mountains and the Emma chain.

5.4.2 Lowland forest

The majority of the study area is covered with lowland forest. This high forest is found on the well-drained soils of mountains, plateaus and hills lower than 500 m and on the imperfectly drained soils of colluvial foot slopes and river levees. In all cases, soils do not desiccate during dry seasons (Teunissen and Noordam, 2003).
The lowland forest is characterized by the presence of a high fauna and flora diversity and intense production of biomass. The total biomass of a lowland forest vary between 300 till 750 tons of dry matter/ha (Plouvier, 1992).

Several storeys can be distinguished in lowland forest in optimal form. The upper storey consist of scattered emergents, of which some are even 50 m tall, that expand their crowns freely above the nearly closed canopy of the second storey with an average height between 25 and 30 m. Below the canopy, under storeys are found of slender trees, undergrowth species and saplings.
The lowland forest is the vegetation type were the Trio's get a range of NTFP's (non timber forest products) which are described in chapter 5.5.2 (Non-commercial use of wild

plants). In the undergrowth, palms such as “paramaka” (*Astrocaryum paramaka*) and “bugrumaka” (*Astrocaryum sciophilum*) are common. Palms (*Palmea sp*.) provides the Trio food and warm drinks, construction material (floors, walls and roofing thatch), brooms and brushes, fibers and hair oil. In the past and also presently, lowland forests in inhabited areas have been cleared for shifting cultivation. During bush clearing trees as “wanakwari” (*Vochysia tomentosa*), “boskasjoe” (*Anacardium giganteum* or *A. spruceanum*) and “maripa” (*Attalea maripa*) are spared.

The favorite construction tree present in the lowland forest is “bruinhart” (*Vouacapoua Americana;* Tr: wakapu). The Brazil nut (*Bertholletia excelsa*; Tr: tuhka) is another important representative within this type of forest and within the floodable forest. In Suriname, Brazil nut trees are found dominating the areas west of Eilerts de Haan Mountains, on the Corantijn river basin, the Kuruni and the Sipaliwini river basin. *Bertholletia excelsa* spots are marked on the land use and land protection map of the Trio (ACT, 2007). A large Brazil nut forest is found in the proximity of the Ararapadu village.

In the mid 80’s, tree connoisseur Frits Van Troon, then employed by the Nature Conservation Division (NB) of the State Forest Service (LBB), visited the Trio area several times in order to survey the area and to study the forest types. Fourteen forest records, with a plot seize between 100 x 10m and 200 x 20m, were made in the lowland type covering the Trio area. Eight forest records were taken in the Kuruni-Sipaliwini area; six in the Tapanahony-Palumeu area. Recorded trees in the Kuruni-Sipaliwini area (mainly in the Kwamalasamutu surroundings) are dominated by “walaba” (Eperua sp.), followed by “bruinhart” (*Vouacapoua Americana*), “grootblad kwepi” (*Licania jimenezii*) and “harde bast kwepi” (*Couepia cognate*). In the Tapanahoni-Palumeu area many “basralocus” (*Dicorynia guianensis*) was encountered. Some other repeatedly observed trees in that part of the area are “kopi” (*Goupia glabra*) and “rode sali” (*Tetragastris altissima*).
For the Corantijn area, between the Lucie- and Kuruni river, tree connoisseur F. Dieko (2007) mentions a lot of “bruinhart” (*Vouacapoua Americana*) and “dukali” (*Brosimum* species) followed by "hoogland tafrabon" (*Cordia sagotii*), “kopi” (*Goupia glabra*), “gele kabes” (*Vatairea guianensis*) and “kow-udu” (*Bagassa guianensis*).

5.4.3 Floodable forest

Along most rivers and creeks in the interior, and this is not different for the Trio-area, a part of the forest will be flooded during the rainy season (March-July). The period of full inundation will determine the richness of plant kinds; the longer the soil is under water, fewer different plant kinds are found and the more homogeneous the vegetation.

Floodable forests are enriched with a large number of species from the surrounding lowland forest and rich in palms, but their numbers vary with the locality. “Maripa” (*Atalea marina*; Tr: maripa) and “pina” (*Euterpe oleraceae*; Tr: wapu) reach the canopy, where as “bugrumaka” (*Astrocaryum sciophilum*; Tr: muru), “tasi” (*Geonoma* species) and *Bactris* species belong to the undergrowth. In the forest north of Amotopo, “pina” is

abundant growing in large clumps, attracting several toucans and other birds enjoying the ripe pina-fruits.

Along the Corantijn river, south of the Sandlanding settlement, a “weti krapa” (*Carapa Guianensis*; Tr: Karapa) forest that could be of economic importance for the Trio dominates. On the more upper part of this river, once past the mouth of the Kabalebo river, till the Wonotobo falls “watra-walaba” (*Eperua rubiginosa;* Tr: palalang/totopo*)* and the climber “keskesbroso” (*Combretum rotundifolium;* Tr: saroto) with his orange stamens arranged as a one side brush (fig. 5.4) are found abundantly. Scattered on the levees of the Corantijn “mora” (*Mora exelsa*) is found. On regular distances, a majestic “kankantri(e)” (*Ceiba pentandra*) is present (fig. 5.5).

A vegetation observation between Amotopo to Kuruni, navigating an upper part of the Corantijn river and the first 50 km of the Kuruni river, revealed many "switbonki" species (*Inga sp*.; Tr: kalauw), "mira-udu" (*Triplaris surinamensis*), "laagland babun" (*Virola surinamensis*), and “awara” (*Astrocaryum vulgare*). First observations of ACT’s biodiversity coordinator revealed that Brazil nut trees (*Bertholletia excelsa)* growing in floodable forest near Kuruni, produce larger and tastier nuts then those occurring in lowland forests.

In floodable forests along the Sipaliwini River, many "watraswitbonki" (*Inga sp*.; Tr: kalauw) and *Eperua species* (Tr: totopo) are present among a range of palms.
Trees observed in floodable forests in the Tapanahoni-Palumeu area include: “redi-loksi” (*Hymenea courbaril*), “tonka” (*Dipteryx odorata*), "zwamptamarinde" (*Elisabetha sp.*), “tapuripa” (*Genipa Americana*) and a lot of “walaba” (*Eperua falcata*).

“Mokomoko" (*Montrichardia linifera;* Tr: kurukuni) occur on the bank side of most rivers and creeks, often accompanied by “brantimaka” (*Machaerium lunatum*).
Rapids and falls are the characteristic habitat for the “kumalu-nyanyan” (*Mourera fluviatilis*) and the other members of the *Podostemaceae,* partially underwater tropical water plants that are found in streaming fresh water. In the dry season, they will come out of the water and flourish abundantly. At the border of the Wonotobo falls, upstream of the Corantijn River, a *Clusia species* is found abundantly. The Trio name of this plant, “Wanapan”, inspired the Trio for their village name when they settled from Kwamalasamutu in the proximity of those falls in 1999.

5.4.4 Liana forest

Lindeman and Moolenaar (1959) characterize liana forest by the absence of storey. Larger trees stand so far apart that it is even impossible to speak of a canopy layer. Tall trees do still occur but are frequently draped with lianas, which also fill the gaps between the trees with an impenetrable scrub. Lightwood species are relatively important.
Within the land inhabited/used by the Trio, those forests are found at the mouth of the Lucie (Totopo eeku) and the Kuruni (Kuruni eeku) river. “Swietboontje” (*Inga sp.*) and “salie” (*Tetragastris sp.*) are frequent in this forest type.

More liana forest occurs around the Përe eeku and Paripo eeku creeks, but this part of the study area is to our knowledge not used or inhabited by the Trio.

5.4.5 Savanna related vegetation

Only 1% of Suriname may properly be considered as savanna, lasting because of the regular presence of fire. Their unique ecosystem accommodates nearly 20% of the more then 5000 plants known in Suriname.
In South-Suriname, along the head waters of the Sipaliwini River, lays the Sipaliwini savanna, a part of the ten times larger Paru savanna in Brazil and the most important savanna within the Trio area. This savanna (Tr: oii) exists mainly of a largely grassland savanna with countless *Bulbostylis spadicea* (fig. 5.6) covering the ground. The place is further dotted with the fire resistant “sabana kasju” (*Curratella Americana*; Tr: tatata) and alleys of “morisi” palms (*Mauritia flexuosa*; Tr: koi) along creeks and in low swampy areas (fig. 5.7)
Tropical forest surrounds the entire savanna but periodic large fires (in the dry season) and the rivers/creeks, which can not be crossed by savanna fires, maintain the existing boundaries between both vegetation types. Other savannas of the "Paru type" in the Trio-area are the much smaller Käyser savannas in Käyser Mountains and the Apikolo Savanna" between the Palaime and the Ku-ini Creek.
The Sipaliwini savanna, like all other savannas in Suriname, was once part of a savanna that covered almost the entire Guiana Shield. When the savanna climate changed into the present rainforest climate (about 10,000 years ago), the savanna area along the Upper Sipaliwini and Upper Paru river was already populated by indigenous people. By frequent burning, they kept the Sipaliwini-Paru savanna open (Teunissen and Noordam, 2003).
Most related to grass savannas are the herb and shrub vegetations on stretches of bare rock in the granite areas, also known as "rock savannas" (Lindeman & Moolenaar 1959).
In the Sipaliwini savanna, islands of lowland forest (5.4.2) are found on hill slopes. Along larger savanna creeks, floodable forest (5.4.3) has been developed.

5.4.6 Secondary forest

After the original vegetation (the primary forest) has been removed for cultivation fields and the cleared place was abandoned for some years, the forest will recover and secondary forest can appear. Light loving plants such as “boesi papaja” (*Cecropia sp.*), will appear quickly and the first vegetation suits the soil for the development of further plant species. Nevertheless, the secondary forest usually remains poorer in plant species than the original primary forest. It is not unusual that one specimen dominates.
Secondary bamboo vegetation, generally assumed to occupy former settlements not only occur along the large rivers, but are also present in remote areas, several kilometers away from navigable streams.

Fig. 5.4: Combretum rotundifolium

Fig. 5.5: Ceiba pentandra

Fig 5.6: Bulbostylis spadicea

Fig. 5.7.: Sipaliwini savanna

5.5 Wild flora

No attempt has been made to produce a complete list of the wild plants in the Trio area due to the limited available time. A preliminary but extensive list of plant species used for subsistence was assembled by ACT/Teunissen and Noordam (2003) out of a range of publications and adapted to the Trio area. This list is completed with additional species by the present authors and the assistance of a tree connoisseur. It is used as base for the survey and presented in annex V. Next to scientific names, English, Dutch and Sranan Tongo names were added to the list. Wayana and Trio names are present as far as they are known. It is quite obvious that the Trio depends on this wild flora. Their plant collecting habits and the principal use of these plants (non-commercial and commercial) is described below.

5.5.1 Plant collecting habits

In the living area of the Trios, many useful wild flora is available. They can be found on the forest floor as well as in the higher canopy layers, in open savannas as well as in dense forest or along waterways. Most used plants from various families are seasonal. The desirable Brazil nut (*Bertholletia excelsa*) for instance, is collected from February to September (Sahieda Joemratie, personal communication, 2007).

It is no common practice to collect wild plants in a destructive way. Mostly only the requisite pieces of the plant (tree fruits for food, seeds for ornaments, and culms for pan flutes) are obtained without damaging the remaining parts. Because of the remoteness of the Trio villages to markets, timber and NTFP, including resins for making torches, nut casings for use as containers, as well as plants for preparing hunting/fishing implements are removed for subsistence only.
Collecting plants, especially fruits, is often a social activity. A family or a group of children assemble the fallen ripe sweets in a woven basket that is often made on the collecting site itself. During hikes to the cultivation fields or during fishing- or hunting trips, useful plant parts are gathered more incidentally. A wide variety of tree fruits, especially palm fruits, are considered to be very delicious.
In the forest, the Trio also gather timber for housing, boat building, firewood, roofing and twinning materials. In most Trio villages, a single chain saw is present. Although, due to the scarce availability of fuel, a chopper is much more common for the harvest of wood or for the clearing of cultivation fields. In annex V, the wild plants used for subsistence (over 200 species) are grouped by non-commercial utilization categories: plants used for construction (houses, utensils, canoes), for utensils, as food, for hunting/fishing, as resins, oils, as medicine, poison or repellant, for body care and ornaments, for music instruments and as firewood. During a hike in the surroundings of Amotopo with Trio source people, about 50 percent of the encountered plants were indicated to be used for various purposes. This reveals the depth of knowledge people have about the present vegetation and its properties and why, for all non-commercial uses of wild flora, it is most probably that the amount of used plants are a lot higher then listed.

5.5.2 Non-commercial use of wild plants

For construction (houses, canoes) - for utensils - as food -
for hunting/fishing - as resins, oils - as medicine, poison or repellant -
for body care and ornaments - for music instruments - as firewood

Construction (houses, canoes)

For the Trio, the forest resources provide all the materials needed for the construction of their homes. Each part of the house requires a specific plant (fig 5.8). Annex V lists preliminary 20 species for several construction purposes.
The thatch roofs are made of “tasi” (*Geonoma baculifera*; Tr: maraja). The durable hardwood specie *Vouacapoua Americana* (Tr: wakapu) is indicated as the favorite kind of construction wood, “gubaya” (*Jacaranda copaia*: Tr: kunatepi) and *Eschweilera* species are also often named for construction purposes.

Soft wood species are applied as roof supports. Durable split palm stems were favorites to fabricate floors but are nowadays mostly replaced by planks. Softer bamboo and "warimbo" are applied in walls and sometimes tied together with fibers of “koi” (*Mauritia flexuosa*) or aerial roots of *Araceae* species.

For the construction of their canoes and paddles, eight (8) species are listed in annex V. Preferred trees used for dugout canoes are “kopi” (*Goupia glabra*; Tr: pasisi) and *Moraceae* species such as “kawudu” and “dukali”. Peddles of their canoes are usually made of *Aspidosperma* species and “bugubugu” (*Swartia sp.*; Tr:kwikwiweti).

Utensils

Woven household utensils such as manioc presses (Tr: matapi), sieves (Tr: manari) and storage boxes (Tr: pagara) are mainly made of the stalks outside of *Ischnosiphon sp*. and *Calathea sp.* (warimbo). Carrier baskets (Tr: katari) are usually made of palm slips and tree bark is used for the carrying ropes (fig 5.9). Jars and containers are often made of the pericarp of “krabasi” (*Cresentia cujete*; Tr: kamo) or the inflorescence-sheath of “maripa” (*Attalea maripa*; Tr: maripa) while the inflorescence of “pina” (Euterpe oleraceae; Tr: wapu) is used as a broom.

Food

Most vegetable food comes from the cultivation field or gardens. Many of the traditional wild yams for instance, have now been substituted by cultivated varieties. Nevertheless, nuts, fruits, roots and seeds (or pulp around the seeds) from the wild plants forms a significant supplement in the Trios diet. Annex V lists more then forty (40) wild plants but especially wild palm species have a wide application range as cooking oil, drinks or fruits. From several *Inga* species (*Mimosaceae*), the pulp around the seeds is favorite and those trees are nowadays planted in the nearby surroundings of houses. The water stored in the roots of the “manbospapaya (*Cecropia sciadophylla*; Tr: ume) is drunk while their dried leaves can serve to make a thee extract.

The “sabana kasju” (*Curratella Americana*; Tr: tatata), which is abundantly present in Sipaliwini, does not provide direct food, but their flowers are much loved by the present bees for the production of honey.

Hunting/fishing utensils

Besides raw meat and silver bait fishes, a lot of seeds and fruits are used as fish bait such as the seeds of “watra-walaba” (*Eperua rubiginosa;* Tr: totopo) and the fruits of “tafrabon” (*Cordia sp.*). *Araceae* species are used to train hunting dogs (ACT/Teunissen and Noordam, 2003) and the bark of “mope” (*Spondias mombin*, Tr: maapa) is used to make a whistle that attracts “konikoni” (*Dasipocta leporina*; Tr: akuri). In annex V more than 20 species are listed for the manufacturing of the Trio hunting and fishing utensils.

Resins and non-cooking oils

Annex V lists ten (10) wild plants of which the resin is used for lightening or from which the oil is used as glue or insecticide. It must be said that nowadays, those substances are mostly replaced by modern materials, coming from a nearby city.

Medicines, poison or repellant

The use of plants for traditional medicine is found in all traditional societies of the world. Indigenous people in the Amazon region use approximately 2000 different plants for their traditional medicines (Richardson, 1991). An overview and description of different species of medicinal plants (including trees, palms, lianas, shrubs, herbs, ferns, mosses and fungi) used by the Trio people is found in Plotkin’s (1986) *Ethno botany And Conservation of the Tropical Forest with special reference to the Indians of Southern Suriname* where more then 300 different plants are described for traditional medicinal purposes. Plotkin correctly argues that the list is indicative and that the number of the tribe’s medicinal plants is most likely more elevated.

Body care and ornaments

Annex V lists four species for body care; but soap, shampoo and related are nowadays mostly bought in the capital city or nearby villages.

During festivities, wild plants are used as body paints: the red "kuswe" (*Bixa orellana;* Tr: whise) and black "tapuripa" (*Genipa Americana*; Tr:menu) provide the red and black colors.

A variety of seeds is used for ornaments. The regularly used “morototo” (*Didimopanax morototoni*; Tr: maramara) seeds are often painted with different vegetal colors and applied to decorate necklaces, hair tubes and maracas, sometimes in combination with animal products (feathers, teeth).

Music instruments

Pan flutes are made from bamboo culms (*Guadua sp*.; Tr: sari); maracas from gourds (*Lagenaria siceraria*; Tr: atoreïme) and seeds; and drums from the wood of *Cedrela, Nectandra and Ocotea species* where animal skin is spread on top of it. “Jorojoro” seeds (*Thevetia peruviana*) are threath on a string together with “maramara” seeds around the ankle and make a nice sound while dancing (fig 5.10).

Firewood

Firewood is a very important daily requirement for a Trio family and provides nearly 100 percent of the energy requirements for cooking. Most woody species are used as firewood, although the selection of the firewood (much smoke, more heat) can depend on the purpose or on the remoteness. Some important cooking firewood are “boskasjoe” *(Curatella Americana*) in Sipaliwini and *Elisabetha sp.* in Kwamalasamutu. Firewood collection is often associated with agriculture; this means that firewood is collected from old gardens, plantations and old dead trees. Trees are not felled specifically for firewood.

5.5.3 Commercial use of wild plants

Because of the long distance to public markets for most Trio villages and because of the high costs of air or boat transportation, not many Trios in south west Suriname depend for their income on the trade of timber, non-timber forest products (NTFP's) or crafts derived from wild plants. An exception forms the village of Araraparu. Since 2001, sustainable harvesting of Brazil nuts is a common activity for men, women and children between the months of February and September. 91 Percent of all adults (> age 15) in this community earns income from Brazil nuts collection and subsequent sale.

First observations of ACT’s biodiversity coordinator in August 2007 revealed that Brazil nut trees (*Bertholletia excelsa,* fig 5.11*)* growing in floodable forest around Kuruni produce larger and tastier nuts then those that occur in lowland forests, so commercialization could be interesting.

In Palumeu, Wanapan and Kwamalasamutu, a small amount of woven crafts and ornaments are sold to the visiting tourists.

Fig. 5.8.: Trio dwelling

Fig. 5.9.: Carrier basket

Fig. 5.10.: Jorojoro and maramara seeds

Fig. 5.11: Brazil nuts (source: S. Joemratie, ACT)

5.6 Wild fauna

No attempt has been made to produce a complete list of the fauna in the Trio area due to the limited available time. A preliminary but extensive list of animal species used for subsistence was assembled by ACT/Teunissen and Noordam (2003) out of a range of publications and adapted to the Trio area. The list is used as base for this survey and is presented in annex VI. It includes a subdivision in game species, cage species, harmful species, protected and not protected species[16]. Next to scientific names, English, Dutch and Sranan Tongo names were added to the list. Wayana and Trio names were added as far as they are known. It is quite obvious that the Trio depends on this wild fauna. Their hunting and fishing habits and the use of this fauna (non-commercial and commercial) are described below.

5.6.1 Hunting (Tr: weiwato) and fishing (Tr: kanaemoto) habits

age - pattern - season - tools

Age

The age where men usually start hunting is young and varies between 10 and 15 years old. Fishing is done from the age of 7-9 years.

Pattern

One or twice a week a hunter goes the forest, mostly accompanied by a friend or relative, to look for bush meat. They generally stay away for one whole day. Exceptions are made during clearing of cultivation fields and when a ceremonial party has to be prepared. During field clearing, in the beginning of the dry season and planting season (peek in November) some days only manioc bread is available as food due to a lack of time for fishing and hunting.

For the planning of a festivity, up to 15 hunters will be sent out for several days. While two of them stay at the temporary camp to collect fire wood and to prepare the caught meat, the others continue hunting the surrounding forest.
According to Trio sources, the men prefer to hunt in the daytime, the fear of supernatural spirits discourage nighttime hunting.

[16] game species: allowed to *hunt* during open seasons (incl. bag limit)
cage species: allowed to *catch* during open seasons (incl. catch limit), to keep as pets and to use as food
harmful species: allowed to *kill* year around such as house rats and mice and house and blood-sucking bats.

Table 5.1 Season based guidelines in the Trio village of Sipaliwini

English name	Trio name	hunting/fishing period	reason
All Primates	tamokonpë	May/June	The animal is at the peak of its weight
Orange rumped agouti	akuri	Year round, but easy to catch when they are "drunk" after eating fermented fruits.	Always in the vicinity, also from cultivation fields
Collared peccary/ White-lipped peccary	pakira/ pëinjekë	Year round, when a herd comes in the vicinity of the village	Large amounts (10/20 animals) can be caught in a few hours
Tapir	pai	May/June, only if enough hunters are present on the site to transport the animal	The animal is at the peak of its weight
White-tailed deer	wikapau	End of dry season (Oct./Nov./Dec.)	Are then the leanest, fat of this animal is not appreciated
Giant anteater	masiwa	May/June	The animal is at the peak of its weight
Macaws	kinoro/ arawawa	July	Comes down from the canopy layer of the forest to learn nestlings fly and are easier to catch
Black curassow	oko	Jan./Feb.	Makes a lot of noise during those months, easier to trace
Lesser seed-finch	picorë	Year round, but in Jan. only the male	Eggs are laid around January
Tortoises	kudija	End of dry season (Oct./Nov./Dec.)	Nearby savanna is burnt; turtles can be picked up
Black Caimans	ariwe	Jan./Feb./Mar.	The animal is at the peak of its weight
Iguana	iwana	To eat the animal: May/June To keep for egg-laying: Sep./Oct.	The animal is at the peak of its weight Females are then expected to lay eggs.
Northern tegu lizard	lupë	Year round	Always in the vicinity of the village
Emerald tree boa	itu aaro	June	More snakes are present on the riverside because of high water level
All fishes	kana	Aug./Sep./Oct.	At the peak of their weight and easier to catch because of low water level

Hunting/ fishing season

In general, the Trio catches most bush meat at the end of the dry season when creeks are nearly dry and wild animals are forced to come to the rivers for their water supply.
In earlier times, before the Trio communities concentrated around artificial facilities such as airstrips, policlinics, schools and churches, a traditional hunting calendar was applied. What the Trio could remember from their traditional hunting calendar was presented in the Mamia Pakoro Project Document (MEU 2001) and found in annex VII.
Nowadays, in some Trio villages, the population has grown extensively so pressure on wildlife and fish become extremely high and in most villages the practicing of this hunting and fishing calendar had to be abandoned.

In Sipaliwini village, interviewed hunters and fishermen still use season-based guidelines that are summarized in table 5.1. The reasoning why the animal/fish is caught in that particularly period is added in the last column of the table.

Tools

In previous days, bow-and-arrow and spears were the most common used hunting tools to catch the bush meat. Nowadays, in Palumeu (mixed Trio/Wayana village) those weapons are fabricated to entertain and to sell to the tourist of the nearby tourist centre under METS management. None of the questioned hunters aimed to use a spear or blow pipe anymore.

Past decades, fire arms are preferred over other hunting tools. The availability of (expensive) bullets, purchased in Paramaribo or in a nearby city (Nieuw-Nickerie), is often named as a primary problem in the hunter's need. If bullets are absent, bow-and-arrow are still predominant. According to the size of the animal, hunting arrows have different characteristics. Sometimes a trap is made (to catch the armadillo) or an animal is caught by hand (egg laying iguanas). Dogs are used to rush wildlife and to find the wounded animals, so these domestic animals remain an important hunting aid. They receive superior care compared to the other village dogs.

In Sipaliwini, nearby savanna vegetation is burned at the end of the dry season to clear the thick brush so that animals are exposed. Tortoises can than been picked up by dozens.

Several fishing techniques are observed. The most common method is a long hand line with a nylon line and iron hooks, while the use of nylon fishing nets (1-1½ inch mesh) in creeks and rivers becomes more and more popular. Unlike for hunting, bow-and-arrows and harpoons are still used regularly for fishing. Figure 5.12 shows a three-tooth harpoon (Tr:somi) and a bow-and-arrow used in Sipaliwini to catch "anyumara" (Tr: aimara). Sometimes the Trio make use of fish traps or poisons that originate from parts of wild plants (wood, roots, leaves, flowers, fruits or seeds). Flowers/fruits and seeds are also popular as fish bait (see annex V). The most skilful fishers catch their fish by hand. This happens in shallow water bottoms or dried up beds at the end of the dry season.

5.6.2 Non-commercial use of wild animals

as food – as tools – for hunting and fishing utensils – as medicines – as adornments and music instruments

In annex VI, the wild animals used for subsistence (over 700 species) listed by ACT/Teunissen and Noordam (2003) are grouped by utilization category: animals used as food, tools, to manufacture hunting and fishing utensils, animals used as medicines and to produce adornments and music instruments. The different uses will be described bellow in brief. Historically, the described applications under tools, utensils, medicines and rituals were much more common than nowadays.

The use as food

As animal husbandry is almost non-existent, wild-caught animals and fishes are very important for daily protein intake within the Trio diet.
In the list of consumed wild animals (annex VI), 40 names are found but larger mammals such as tapir, peccaries, deer species, armadillos, most monkeys and agouti are preferred.
Larger birds (such as tinamus, black curassow, trumpeter birds, macaws and toucans) and larger fishes such as anyumara (*Hoplias aimara*, with a maximum weight of 40 kg) are also preferred above small ones. Iguanas (fig. 5.13), black curassow and toucans are considered a delicacy (Tr: tëponje).

The use of wild animals for tools

According to ACT/Teunissen and Noordam (2003), jaws with tusks of both species of peccaries are used as planes to shape bows. Yaws with incisors of the agouti paca are used as a chisel.

Hunting and fishing utensils

Feathers of harpy eagles, vultures, black curassows and parrots are used as shafts of arrows. Feathers of parrots and toucans are applied as ornaments for bows, arrows and arrow-head containers. The skin of some mammals is used to produce lids to close those containers. Small lizards and fishes are used as bait.

Medicines

According to Baal & Held (1995), the larynx of the howler monkey and toucan soup and beak are used against stuttering and the grated antlers of deer are used against convulsion.

Adornments and music instruments

Animals are primarily hunted for food. Their teeth, skins and bones are re-used.
Monkey, peccary and jaguar teeth and fish bones are applied in necklaces. Spider monkey bones are used in combs and as flutes, deer bones are used as flutes, sloth skins to produce lids and drums, and tortoise shells are used as music instruments. Feathers of all colors decorates ceremonial head-dresses (fig. 5.14)

5.6.3 Commercial use of wild animals

In order to regulate the export of wildlife, the trade in wild caught animals is controlled by the Government of Suriname with the use of an export quota system for exporters, non-residents and residents. The export of wildlife is only permitted for the species mentioned on the quota-list and for the respective quota, which are established each year[17]. The minimal Free-On-Board values for each species are also established annually. Total revenues from the export of live animals fluctuate. The mean annual wildlife export from 1997 until 2000 was around US$ 1 million (Teunissen & Noordam, 2003), US$ 1,750,000,- in 2002 and decreased since then down to US$ 800,000,- in 2005. The department of nature management (NB) estimated that more then 300 workers (full-time or part-time) are involved in the wild life trade. Statistics at the department of LBB/NB do not allow for determining the share of the Trio area in the realization of the export revenues.

The main commercial animal groups in Suriname are: macaws, parrots and parakeets, songbirds, reptiles and amphibians. The export of *Psittacidae spp.* (macaws, parrots & parakeets) represented more than 50% of the total annual value. The reptile traded in the greatest quantities is the green iguana (*Iguana iguana*) with 5.574 individuals exported in 2000 (Duplaix, 2001). The most valuable is the emerald tree boa (*Corallus caninus)* with an export value of US$ 40,715 in 2000 (Andel van, T et al., 2003)
Negligible numbers of food fish species are caught for commercial use and sent to nearby cities (Apura, Nickerie, Kwamalasamutu or Paramaribo), while there is no observed trade in aquarium fishes.

Most Trio are now familiar with the use of money, and they are increasingly in need of a regular cash income in order to obtain supplies like soap, lamp-oil, bullets, flashlights and electric batteries, and in some cases gasoline and oil for outboard motors. Over the past decades, animal trade (fig. 5.15) was and still is an important source of income for the Trio although the price paid to the animal trappers is generally very low.

The chain for animal export from the Trio area to the outside world and the associated added value for two favorite commercial animals is as follow:

Trio men in the village surroundings mostly play the role of trappers. Birds are caught with mist nets, placed in favorite trees. Nestlings of macaws, parrots, parakeets and toucan species are mainly collected between early February and late May. Snakes are collected incidentally. Snake hunting starts even at the age of 10. In some seasons night trips are organized on the river to search for snakes (tr: eh-keï) along the forest edges. While shining with a flashlight, the snake's retina reflects red eyes and can be traced.
Recorded retail prizes on site are for the seed finches (*Oryzoborus* sp) US$ 25-29 (SRD 70-80) and for the emerald tree boa (*Corallus caninus)* US$ 36 (SRD 100), which is one the most demanded, and therefore most expensive, snake.

[17] Permits for CITES and non-CITES species are granted by NB (Nature Conservation Division) of LBB (Suriname Forest Service)

Middlemen buy the wild-life on site from the trappers and transport the animals to a city or wildlife collecting area such as Apura, Tëpu and Kwamalasamutu.
From those collection sites within the Trio area, animals are transported to the capital of Paramaribo and a part of them are sold to the pet shops where the price varies between US$ 100-400 for the seed finches (depending on their vocal skills) and +/- US$ 350 for the emerald tree boa. Most animals are then sold to (licensed) traders for export. Current markets are the USA, The Netherlands, Asian and the Pacific countries (De Dijn, 2006). Foreign clients are distributors, laboratories, zoo's and pet stores where top singing birds (*Oryzoborus* sp) are valued up to US$ 40,000,- each (Duplaix, 2001).

Fig. 5.12.: Harpoon and bow-and-arrow as fishing tools

Fig. 5.13.: Iguana, a delicacy

Fig. 5.14.: Feathers for ceremonial heads

Fig. 5.15: Animal trade as a source of income

5.7 Endemic, rare and threatened species in the Trio area

5.7.1 Flora

Over 5.800 species of mosses, ferns and seed plants are found in Suriname of which an estimated 50% are endemic to the Guyana shield region. According to ACT/Teunissen and Noordam (2003), the Trio-area has a high plant diversity and contains at least 33 endemic and 211 rare species. A high number of these endemic plant species occur in the savannas of the Paru type that are exclusively found in the Trio-area. The Sipaliwini savanna (63,000 ha) is the largest representative of this savanna type in Suriname. Research during the seventies (Oldenburger, Norde & Riezebos, 1973) shows that this savanna houses a 3,5 times higher plant diversity (number of species/ha) and is 2,5 times richer in plant species than all savannas found in the Northern part of Suriname (total 90,000 ha).

Most of the endemic and rare species within the Trio area are believed to be protected within the Central Suriname Nature Reserve and the Sipaliwini Nature Reserve (section 5.8). Flora species under the threat of extinction are not allowed to be traded, exported, or imported in Suriname as the country has ratified the CITES convention in 1981. The only exemption is made for scientific purposes (see box 1 for more information on CITES).

All questioned Trios indicate "bruinhart" (*Vouacapoua Americana;* Tr: wakapu) as their favorite kind of construction hardwood. This tree species is nowadays listed by IUCN (2007) as the only terrestrial species as critically endangered, based on research in the neighboring country Brazil. According to the people living in the area they are still present in sufficient amounts for their construction purposes. *Virola surinamensis* is listed as endangered and the Brazil nut trees (*Bertholletia excelsa)* and "ingipipa" (*Couratari guianensis*) are listed as vulnerable among 22 other plant species by the World Conservation Union (IUCN, 2006).

*Box 1: CITES**

CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between Governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. For many years CITES has been among the conservation agreements and has now 172 Parties (States that have agreed to be bound by the Convention.).
Since February 15, 1981, Suriname has been a party.
In CITES Appendix I, species are listed that are under the threat of extinction; trade is not allowed for commercial purposes. In CITES Appendix II vulnerable species are listed, commercial trade is allowed under strict monitoring, if the exporting country is convinced that the trade is not threatening the future survival of that specie. Appendix III covers the species that any party country wants to list to help regulate the level of exploitation. Trade, export, and import are only possible by special CITES permit obtained in the countries that have ratified the convention.

*: www.cites.org

5.7.2 Fauna

mammals – birds – reptiles – amphibians – fishes - invertebrates

In the paragraphs below, an overview is given to endemic and locally rare species that are known to occur in the studied area. The 2003 Ecological Survey of the Trio territories by D. Noordam and P.A. Teunissen was used as main resource for this section.
Based on CITES Appendix I and II (valid from 3 May 2007) and IUCN's Red List (2006), attention is then given to internationally endangered or threatened species that are known to occur or to be used in the Trio area. This information is completed with the information gathered during field visits.

Mammals

A total of 185 different species of mammals are recorded for the entire Surinamese land (Alonso & Mol, 2007). ACT/Teunissen and Noordam mention as endemic mammal species only one bat species that most probably is also present in, but not exclusively for, the Trio living area: *Molossops neglectus*. Considered as locally rare species are the savanna fox (*Cerdocyon thous*) and the guinea pig (*Cavia aperae guianae*), both collected at the Sipaliwini savanna.

The giant armadillo (*Priodontes giganteus*), giant otter (*Pteronura brasiliensis*) and jaguar (*Panthera onca*) occur in the Trio area and are listed in the CITES Appendix I as being under the threat of extension. All three mammals are still rather common in Suriname but they are protected and no export is allowed. Some CITES Appendix II species occurring in the Trio area and favorite within the Trio's diet are: all primates, the giant anteater (*Myrmecophaga tridactyla*), the tapir (*Tapirus terrestris*) and the white-lipped peccary (*Dicotyles pecari*). The giant armadillo (*Priodontes giganteus*) and the giant otter (*Pteronura brasiliensis*) are listed as endangered in the IUCN list 2006.

Birds

The total number of birds in Suriname as recorded by Ornithologist O. Ottema reaches 700 birds. (personal communication, 2006). Mittermeier et al (1990) does not mention endemic birds for the study area, but it is believed that most of the 19 endemic birds to the Guyana shield listed in Alonso & Mol (2007) are found in the Trio living area (except the species exclusively found in the coastal area).

Ribot's Website[18] on the birds of Suriname lists 308 species for the Sipaliwini-savanna area of which 42 species are considered as "rare" among which the Harpy Eagle (*Harpia harpyja*), the Sun Parakeet (*Aratinga solstitialis*), the Large-billed Seed-finch (*Oryzoborus crassirostris*) and the Jabiru (*Jabiru mycteria*). None of the questioned Trio in the Sipaliwini village had ever seen the Jabiru, the large-billed seed finch is reported to be disappearing, the other two were reported to have been seen at least ones a month. The large-billed seed finch and the lesser seed finch (*Oryzoborus angolensis*) are famous and highly prized singing birds of the Sipaliwini Savanna. Those, and other nice feathered birds, are captured and send to Paramaribo on a regular base.

[18] http://webserv.nhl.nl/~ribot/ned/tope.htm

Two birds of the study area are listed in CITES Appendix I; the harpy eagle (*Harpia harpyja; Falconiformes*) and the scarlet macaw (*Ara macao; Psittacidae*). Both are regularly hunted by the Trio for their feathers, used for headdresses and arrow shafts.
All other *Falconiformes spp.*, *Psittacidae spp,.*owls (*Stringiformis spp*) and the Guianan cock-of-the-rock (*Rupicola rupicola*), a striking fruit-eater that builds its nest on the rock faces of cliffs or large boulders (fig.5.16), are present in the CITES Appendix II and occurr in the Trio area. The famous harpy eagle is listed nearly threatened in the IUCN list.

Reptiles

The estimated number of reptile species for the study area will approach the total number of 140 species of reptiles known in Suriname. Mittermeier et al (1990) mention no endemic reptile living only in the Trio area. ACT/Teunissen and Noordam (2003) cited the following information for endemic and rare species:
The Sipaliwini savanna hosts:

- Two endemic subspecies of lizards: *Anolis auratus* subsp. *Sipaliwinensis* and *Kentropyx striates* subsp. *Viridicervix* and
- One rare lizard: *Pseudogonatodes guianensis*:, also known from Acarai Mountains and
- one rare amphisbaenian*: Amphisbaena vanzolini*:, also known from the Palumeu area.

None of the Surinamese reptiles occurring in the Trio area are mentioned in the CITES Appendix I. All *Testidunidea* species are mentioned in CITES Appendix II. Representatives occurring in the Trio area are the yellow-foot & red-foot tortoise (*Geochelone denticulata & G. carbonaria*), which are rather common but very much appreciated as easy storable fresh food, not only by the Trio but by all living (working) people in the Trio area. Other appendix II species occuring in the studied area are *Caiman crocodilus* subsp. *crocodilus, Paleosuchus palpebrosus* and *P. trigonatus* (caiman species), several boas (*Boidae species.*) and the tegu lizard (*Tupinambus nigropunctatus*).

Amphibians

As only a few species of Amphibians are restricted to the area north of the Trio-area, the estimated number for the study area will approach the total number of 93 Amphibians presently known from Suriname. The Blue Poison Frog (*Dendrobatus azureus*, fig. 5.17) is considered endemic for forest islands in the Sipaliwini savanna. The distinctive appearance of this frog makes it particularly popular in the international pet trade. Only known from the forest patches in the Sipaliwini Savanna of most southern Suriname, illegal collection was pushing this species close to extinction. However, IUCN 2007 classified the frog as vulnerable instead of threatened because it is now extensively bred in captivity and collection seems no longer a serious threat. According to the Trio themselves, these animals are endangered and the need for population growth is necessary. It is believed by the author that the repeated forest fires[19] and the present evolution of insufficiently supervised tourism can be a serious threat to this animal.

[19] Litter layers, which are the habitat of this frog, are then destroyed

No internationally endangered species are mentioned in Appendix I of CITES. *Dentrobates* species and *Phyllobates* species are listed in appendix II, among which *Dendrobatus azureus*, *Dendrobatus tinctorius* and *Phyllobates trivitatus* occurs in the studied area.

Fishes

At least 750 fish species are known to inhabit Suriname's waters. Most of the fish species known from the Trio inhabited area (estimated over hundred species) are used as food by the indigenous people. For the Kuruni and Sipaliwini Rivers, Ouboter and Mol (1993) recorded 14 endemic fish-species. In the Upper Tapanahoni river system; these authors mention 27 species exclusively for that area. In Suriname, no fish species are protected by law and non of the fish species living in the Trio area are listed in CITES Appendices I or II.

Invertebrates

Insufficient data was available to the authors to characterize the occurrences of endemics and rare invertebrate species in the Trio-area.
None of the Surinamese invertebrates are found in the CITES Appendices I and II.

5.8 Protected areas

Sipaliwini Nature Reserve - Central Suriname Nature Reserve

Approximately 13% of Suriname's land area is under protection (11 Nature Reserves, 1 Nature Park and 4 Multiple-use Management Areas), covering most of Suriname's varied ecosystems. Figure 5.18 represents the country's map with protected and proposed protected areas. In the Trio area, two nature reserves (NR's) are legally protected under the country's Nature Protection Act of 1954 to protect wildlife and the forest they live in: the Sipaliwini Nature Reserve and the Central Suriname Nature Reserve.

In 1972, the Sipaliwini Nature Reserve (SNR), with a surface of 100,000 ha and situated along the border with Brazil, was established to protect the Sipaliwini savanna as the largest representative of savannas of the Paru-type. The reserve hosts also gallery forests, freshwater swamps, isolated patches of forest, and granite outcroppings.

The unique savanna-ecosystem contains many endemic and rare flora species, under which nine fern and fifty-eight angiosperms. Its mainly mountain and lowland forests (see 5.4) contain a high diversity of plant life, with more than 5,000 vascular plant species collected to date. The Reserve's animals are typical for the region and include the jaguar, giant armadillo, giant river otter, tapir, sloth, eight species of primates and no less than 400 bird species such as the harpy eagle, Guiana cock-of-the-rock, and scarlet macaw. At least one frog (*Dendrobatus azureus*) is known to be endemic. Many archeological objects such as indigenous petroglyphs, stone arrow heads and pottery have been found, proving that indigenous people have living in the area for at least 10,000 years (ACT/Teunissen & Noordam, 2003).

Due to remoteness and lack of adequate funding of the Sipaliwini NR, this reserve is poorly managed and animal traders from Paramaribo and Kwamalasamutu together with the local Trio exploit the area, especially for birds. In this Southern savanna, birdlife is abundant and varied and many of the birds are seldom seen in the rest of Suriname. Two beautiful birds that have their peak of distribution here are the sun parakeet and the peach-fronted parakeet (Ribot, personal communication, 2007).

In 1998, the Central Suriname Nature Reserve (CNRS) was established. This reserve, which links the pre-existing Raleighvallen NR (78,170 ha), Tafelberg NR (140,000 ha) and Eilerts de Haan NR (220,000 ha), covers 1.6 million hectares (10% of the total land surface of Suriname) of primary tropical rainforest and is one of the largest strictly protected areas in South America. The CSNR was inscribed as a natural heritage site on the UNESCO World Heritage List on December 2, 2000.

Several unique geological and physical formations occur in the nominated site including several granite inselbergs that rise out of the surrounding tropical forest. The most famous inselberg in the CSNR is the Voltzberg (250m above sea level). A unique geological feature in the CSNR, is the Devil's Egg, a giant boulder balanced on top of a granite spire, that is several hundreds of meters high. Waterfalls and rapids are also present in the nominated site. Flat topped mountains (Tepuis), are found in the former Tafelberg Nature Reserve. In the southern part of the CSNR lies the Wilhelmina Mountain range, the location of Suriname's highest peak, the Juliana Top (1,230 m).

The rich biodiversity of Suriname is well represented in the CSNR. To date nearly 6,000 vascular plant species have been collected from this NR, with five endemic plant species occurring on the Voltzberg Dome and 42 endemic species collected from other areas of the reserve. It is believed that a significant proportion of the more than 1,890 vertebrate species that are known to exist in the country are present in the nominated World Heritage site. A unique ecosystem occurring in the reserve is the Roraima sandstone savanna, the only one of its type in Suriname. This savanna, known as Rudi Kappel savanna, extends over an area of 1,000 ha, and is situated at an elevation of 300 m above sea level (Hiwat, 1998).

Fig 5.16: Guiana cock-of-the-rock (source: Paul Woei)

Fig 5.17: Blue poison frog (source: www.sr.net)

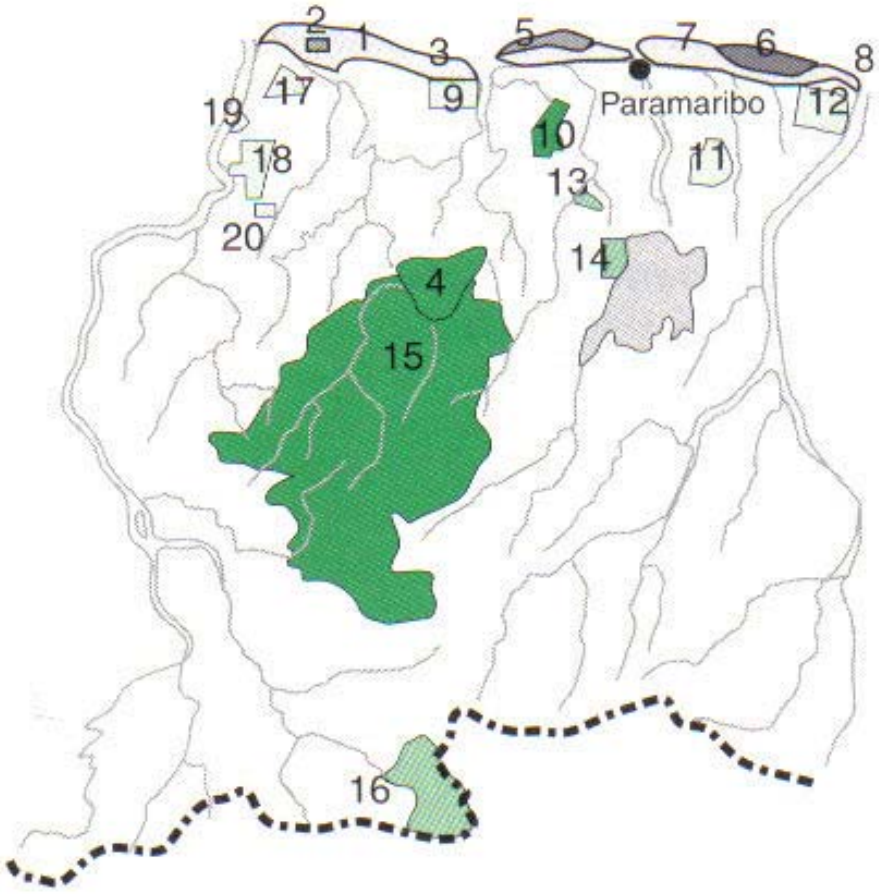


Fig 5.18. Map of protected areas and proposed protected areas in Suriname (source: Goerdayal, L. 2002)

<u>Legend</u>
15: Central Suriname Nature Reserve
16: Sipaliwini Nature Reserve

5.9 Agriculture

Information on the agricultural system and crops was collected during field visits (May-August 2007) to the villages of Wanapan, Sandlanding, Sipaliwini, Kuruni and Amotopo. Surrounding gardens and fields were visited, plants were listed and questionnaires were filled in. In addition, agro-studies conducted in Kwamalasamutu (ACT/Parahoe, 2001 and ACT/Teunissen and Noordam, 2003) and Palumeu (ACT/Delvoye, 2006) provided study data for those 2 villages. Literature sources on the agricultural system of the other Trio settlements are very limited.

5.9.1 Agricultural practices

site selection for cultivation fields – field preparation –
size and number of fields – cultivation and fallow period

Traditionally, the farming system of the Trio is based on shifting cultivation with a high agricultural biodiversity. Most important crops for subsistence are grown on the cultivation fields and multiple varieties of each crop are cultivated to enhance harvest security and to promote diet diversity. Some fruits and utility crops (medicines, sweets and spices, twinning material, etc. (see 5.5.2 Non commercial use of wild plants)) can be found scattered near houses and in the village.

In the following subsections, agricultural practices in the Trio's shifting cultivation system will be described in more detail.

Site selection for cultivation fields

Commonly Trio families make a long-term planning for a series of fields in a certain area. A field is often cleared close to the fields of the previous years. When a location for a new shifting cultivation field is to be a selected, different selection criterion were listed during field surveys:

- That the field can be *reached* relatively *quick and easy* with a great preference for fields along the waterways (fig 5.19) is a general rule in all studied Trio villages. Most fields are found within a distance of 2-3 km from the village, but some are further away, usually located along the river or the main creeks. In the latter case these fields may be found near permanent family camps that have been established along the rivers and creeks.
- *the drainage condition* (it should never flood or have high groundwater levels at any time). All 20 respondents in ACT/Parahoe's study conducted in Kwamalasamutu (2001) agreed that when searching for a new farming site, areas not prone to flooding were preferred. Trios are even willing to travel in order to work on fields, located far from the main village. Some may stay for weeks or months in a row on the plots, if these are remote.
- the *absence of leaf cutting ants* on or near the chosen field is an important criterion in more crowded villages, such as Kwamalasamutu.
- the *texture of the topsoil* (preferably light-textured soils, loamy sands to sandy loams (ACT/Teunissen and Noordam, 2003)). This criterion, related to the soil

workability and the ease with which the cassava can be removed from the soil, was named as most important condition for the cultivation fields in Sandlanding;

- *flatness* was the first criterion in Wanapan. Flatter land is preferred but fields may be opened up on slopes, in case flat areas are limited. Extensive flats are avoided because in such terrain shallow groundwater levels may occur during the rainy season.

Field preparation

When a site is selected, shifting cultivation fields are cut in the primary (preferred) or old secondary forest. First the under-growth is cleared, followed by the larger trees. Some trees are left over since they provide purposeful items such as fruits: "boskasyu (*Anacardium giganteum*); jars: "maripa" (*Attalea maripa*) or body paints: "tapuripa" (*Genipa Americana*). The time of clearing and burning will depend upon the weather conditions but it is usually done in the beginning of the dry season (September-October). After a period of drying, the debris is burned. The planting of staple food is then done as soon as possible (November). The aspect of available time will also play a role in field preparation which makes that different fields can be seen in diverse stages of above mentioned activities at the same time.

Size and number of fields

The findings for the villages of Wanapan, Sandlanding, Sipaliwini, Kuruni and Amotopo is that usually a household clears only one field per year and has no more than three plots cultivated at the same time. Nearly all of the observed fields in these Trio settlements were small; less than 0.5 ha.

ACT/Parahoe (2003) did measurements on 38 Trio fields in Kwamalasamutu and recorded an average size of 0.9 ha. From her study, it appeared that 35% has one field, 55% has two fields and 10% has three fields. A required area/person for subsistence is difficult to measure. Brands (1969) gives a figure of 0.67 ha/person/year, Zwart (1981) speaks of 20 ha/person and ACT/Teunissen and Noordam (2003) did a quick assessment and indicated an area of 2 ha/person.

Cultivation and fallow period

The use-period of a prepared cultivation field is mostly between one and two years. Older fields are present but they are overgrown by the forest. Hardly any production (some older bananas or cassava) is obtained from such cultivation areas. However, these older fields are important for plant material for the following years. Over time, weed invasion and declining soil fertility will make it necessary for the farmers to move to another site. Periodic flooding and pests' outbreak of ants can be other reasons why certain plots are abandoned (see 5.8.4).

During the first year of cultivation, many crops are planted on a new field. Plant material is mainly collected from old fields. After preparation of the field, most field crops, certainly staple food such as cassava (generally dominating on all fields), bananas, plantains and sweet potato, are planted. This is often the season where working on the cultivation fields is a daily activity. Later, when time is available and climate is

favorable, other crops as sugarcane, corn, pineapple, watermelon and vegetables can be planted. The second year fields have far less different crops, with again a domination of cassava, which is replanted after harvesting. Besides this, sugarcane and occasionally cotton, pepper and pineapple can be observed along paths through the older fields.

Shifting cultivation can be a sustainable food production system as long as a sufficient long fallow period is taken in consideration before using the location again. When land is re-cultivated after a short fallow period, soil fertility has no time to regenerate and higher incidences of disease and pest outbreaks are expected. In the Trio community, the fallow period varies but the number of inhabitants in the village seems to be the most decisive factor. Reusing the plot is most common after one (Kwamalasamutu) to five years. In Wanapan, with its 34 inhabitants, farmers stated that they never use a same plot again.

5.9.2 Crops on the cultivation fields

Annex VIII presents an overview of crops planted/used by the Trio. Scientific, English, Dutch, Surinamese, Trio and Wayana names are added as far as they are available. The most important staple crop, cassava (*Manihot esculenta*), is grown on nearly all fields. Different varieties of cassava are planted for different purposes (bread, eaten with "pepre watra[20]", boiled with bush meat and fish or as alcoholic drink (Tr: kasiri)). New cassava is planted as soon as the first is being harvested. The cassava crop is harvested gradually, each time a certain amount, starting around six to eight months after planting. The growing period varies, depending on the cultivar and on the location. Other staple food plants covering the Trio's daily carbohydrate intake are bananas/plantains (*Musaceae* sp.), sweet potato *(Ipomoea batatas)* and yams (*Dioscorea alata*). Staple food is present on all fields. Sugarcane (*Saccharum oficinarum*), corn (*Zea mais*) and pineapple (*Ananas comosus*) are found on more than 25% of the fields. Pepper (*Capsicum sp*.), nuts, fruits and non food plants as cotton (*Gossypium barbadense*) are present on 10-25% of the fields. Cotton is mainly used for the making of hammocks (fig 5.20). Vegetables, except for some *Curcubitaceae* species, are nearly absent on the fields.

5.9.3 Crops in villages and camps

While in the fields the observed crops are mostly traditional ones, in the living areas also many introduced species are found. Overall, the crop diversity is higher in the villages than in the fields. During this survey, crops have been listed in five Trio villages (Sipaliwini, Wanapan, Sandlanding, Kuruni and Amotopo). In addition, information on Kwamalasamutu is obtained from ACT/Teunissen and Noordam (2003) who registered crops from Kwamalasamutu village and 19 surrounding camps. Many of the crops found in the living areas are fruit crops (represent around 50% of all crops found in villages), of which the most have been introduced, such as mango (*Magnifera indica*) and some *Citrus* species. The group of sweets & spices is dominated by pepper (*Capsicum sp*.), which is

[20] Peppered soup

common in the camps and villages. “Switbonki” (*Inga spec.*) is saved during clearing or planted in groups for its pulp around the seed that is eaten as a sweet.

Non-food plants represent nearly 25% of the total crop assortment. These are among others: cotton trees (*Gossypium barbadense*) and "singrasi" (*Bromelia alta*) for the use of their fibers as twining material, calabash tree (*Crescentia cujete*) of witch the pericarp is used as jar, cana (*Cana indica*) and *Coix lacrima-jobi* for the making of ornamentals and a lot of scrubs and weeds that are used as medicines. For more details on the use of non-food plants is referred to paragraph 5.5.2 and annex V. Differences in crop varieties between locations are generally small.

5.9.4 Pests

Farmers in all visited villages claimed to encounter various problems when planting, among which pests are the most important. Slugs gnaw at the cassava roots on the fields in Wanapan, moths attack the corn plants in Sandlanding and in the larger villages such as Sipaliwini and Kwamalasamutu leaf cutting ants are present in most of the cassava fields.

Each village had its particular major pest problem but some of them, such as leaf-cutting ants (fig. 5.21) and agouti, were present in all villages. Other pests indicated during questioning are slugs, moths, dears, apes, peccary and birds. Mammal pests are not seen as a major problem, because they can be hunted easily while eating the crops.
None of the agriculturalists in the questioned villages (Wanapan, Sandlanding, Sipaliwini, Kuruni and Amotopo) uses chemicals, although several Trios are interested to do so to solve their problems in the fields. Chemical use is especially restricted by the costs, since the farmers grow crops for non-commercial purposes.

Higher incidences of disease and pest outbreaks can be expected when land is re-cultivated after a short fallow period, when the plot is overgrowth with weeds or when monoculture is practiced many times in sequence. The establishment of an integrated leaf-cutting ants program is one of the main agricultural objectives of ACT. Workshops are being held in three different regions and together with the Trio an inventory of infested plots is drawn up to determine the spreading of the pest. The next step is to investigate a, most preferable biological, solution.

Another major problem that was observed during survey trips is the flooding of the shifting cultivation fields due to the excessive rainfall.

Fig 5.19: Agricultural fields along waterways

Fig 5.20: Hammock (left) made of cotton (right)

Fig 5.21: Cassava root eaten by leaf-cutting ants

5.10 Animal husbandry

No real breeding has been observed during field trips to the nine Trio villages. Sometimes a few poultry is kept but bush meat is preferred. In Palumeu people reported breeding efforts with black curassow but without success. Yet, wild animals are occasionally tended for a period in order to serve as food when time demands:

- Occasionally, a wild mother animal is shot and that her young is kept and fed until ready for consumption (fig 5.21).
- During the months of October/November, female Iguanas carrying eggs are captured until they lay their eggs. They are released afterwards.
- Tasty aquatic tortoises have been brought from Brazil by the Trio from Sipaliwini and released in the Sipaliwini River. It is reported that their number is increasing.
- Savanna tortoises, picked up at the end of the dry season when the nearby savanna is burned, are kept in wooden fences (fig 5.22) and taken when necessary.
- In Kuruni, first steps are taken to create a breeding island in the Kuruni River. A couple of a range of wild animals (spider monkey, paca, ect,) is captured and put on the island. They, and their descendants, will serve as food when meat resources become scarce.

Fig 5.21: A young paca is raised to be eaten

Fig 5.22: Wooden fences to keep savanna tortoises

5.11 Ecological understanding

Suriname's policy makers are more and more aware of the ecological principles and the benefits of a rational and sustainable use of natural resources. In the past decade, several programs have been effectuated on this subject, often in cooperation with international agencies. Due to different factors (the remoteness of the area being an important one), those programs mostly do not reach the people in the Southern part of the country, where the Trio living area is situated.

The way of life and the production system of the Trio (section 5.9) incorporates the accumulated experiences of these people interacting with their natural environment over centuries. Indigenous peoples have a broad practical knowledge about nature, and have used this environment in a sustainable way for centuries. However, during the second half of the 20th century some important changes took place, which had a severe impact on the traditional way of living of the Trio within their environment.

5.11.1 Changing relations with the natural environment

In the last half of the 20th century, some radical changes took place that affected the Trio's relation with and utilization of their natural environment. These changes included:

- In the 1960's, US missionaries founded several mission posts and concentrated Indigenous peoples around those newly created facilities with airstrips, clinics, schools and churches (Chapter 4). This concentration has led to an increased pressure on cultivation land, and wild plants and wildlife required for sustenance and other uses. In addition, the traditional sustainable hunting and fishing calendar had to be abandoned to ensure that all families would find some meat or fish during meager seasons.
- The missionaries not only concentrated the Trio in larger population conglomerates, they also persuaded them to abandon their traditional religion, adopt the Baptist religion and modern medicinal practices. As the traditional belief system and medicines were discredited, traditional knowledge of the plant and animal world has rapidly been lost.
- Fuel-fed generators and outboard motors have become more and more common in order to obtain distant food and forest resources, and buy consumer goods in the capital city. Fuel from these machines frequently leaks from the barrels or the machines into the soil or the river water. Used engine oil is disposed in the environment, which can contaminate a large amount of ground water. Used parts from the engines and outboard motors are usually thrown into the environment.
- Western products such as synthetic shoes and clothes, tin cans, plastic chairs and buckets, batteries, PET bottles and sink roof materials are starting to replace the natural (vegetative) degradable materials.
- Shotguns and nylon fishing nets are substituting wooden spears, ropes and hard wood pins. These changing hunting and fishing methods have promoted over-hunting and over-fishing.

The above processes have led to locally unsustainable uses of land and resources, environmental pollution, and a loss of ethno-ecological knowledge.

5.11.2 Cultivated land and the surrounding ecosystems

Cultivation techniques, by contrast, have changed little apart from the use of introduced tools such as a shovel and a machete.
Because of the highly diversified and temporary crop arrangements, a number of ecological interactions and ecosystems are found. By keeping the plant diversity in the cultivated area, the system provides alternative habitats and food sources for many organisms that perform various beneficial ecological functions. Many plants within or around traditional cropping systems are wild or weedy relatives of crops. In fact, farmers often favor certain weeds in or around their fields that have positive effects on soil and crops (pest repellents), or weeds that serve as food, medicines, for ceremonial items, etc.

5.11.3 Human/environmental interactions in contemporary communities

A rapid assessment of ecological understanding among the Trio provided the following indicative results:

- The Trio are traditionally highly integrated in their surrounding environment of which they feel they are part of. There is a very close relationship between human and nature.

- It would take a more extensive study to assess the present ecological awareness of the Trio, but it can be said that modern changes have an impact on their traditional way of living within their new environmental surroundings. These changes are still minor (except for Kwamalasamutu) but without a basic understanding of ecological processes and environmental problems they can lead to unsustainable use of land and resources, increased environmental pollution and a loss of ethno-ecological knowledge.

- For traditional land cultivation the changes were limited. Agriculture still includes the multiple uses of both natural and artificial ecosystems.

CHAPTER 6
HUMAN CAPITAL

Human capital refers to skills, abilities, and (wo)manpower available in the population. We begin with a presentation of demographic characteristics, focusing on population numbers, age group representation, and ethnic make-up. As we turn to education we assess access to basic education and vocational training, educational achievement, literacy, and language skills. The following section on health lists the main health problems and alternative sources of treatment available to the Trio. We pay special attention to sexual and reproductive health, which was identified as a field where the intervention of health organizations is direly needed.

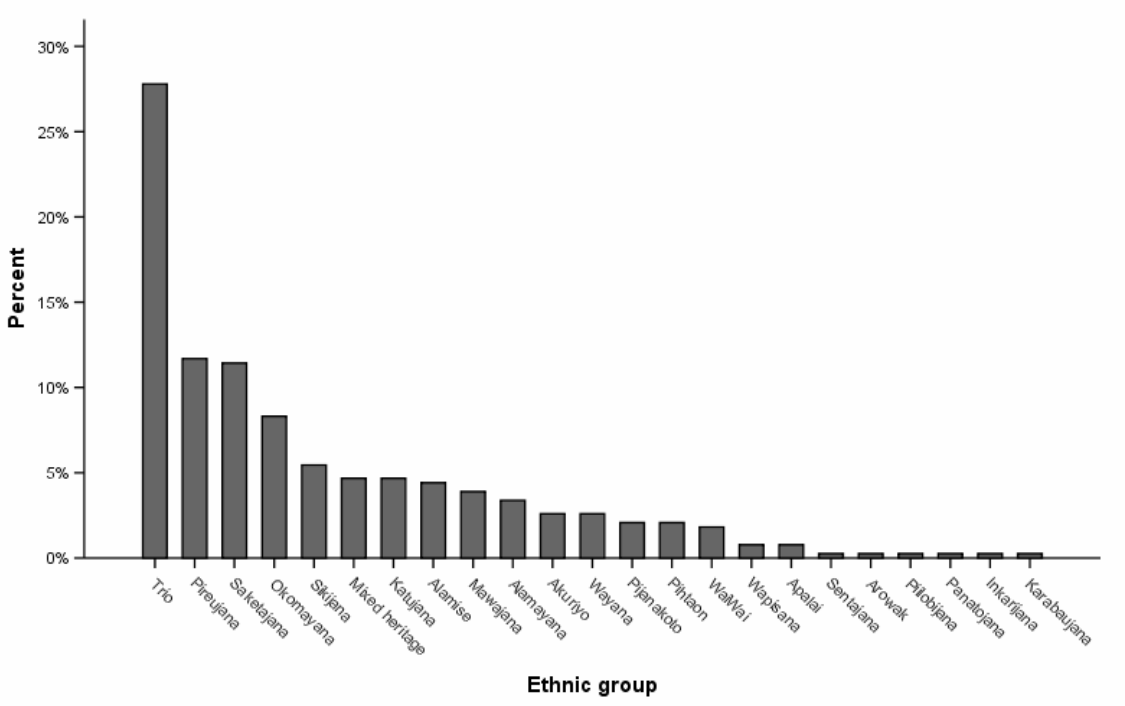
6.1 Ethnic make-up

Prior to the arrival of the European colonists to the Americas, the larger Amazon rainforest was inhabited by thousands of smaller and larger tribal groups. Many of these groups were culturally related and spoke languages that were mutually understandable. When beneficial, for example for warfare or marriage, different tribes could start living together. Such clustering led sometimes to the assimilation of the weaker (in numbers and/or strength) group by a dominant tribe, though in other cases the members of each groups maintained a separate cultural identity. Internal conflicts or resource shortages, in turn, would result in larger groups splitting up again. Their rapid decline in numbers after the European conquest forced many indigenous groups to build alliances with neighboring tribes. As different groups bundled the names of some peoples disappeared, while new names were invented.

Also the people we know as "Trio" are a conglomerate of several indigenous sub-groups. In the book 'Samuwaka herdacht', anthropologist Karin Boven presents oral accounts that suggest that most of the Trio sub-groups already were living together in the 17th century village of Samuwaka. They probably were one of the most numerous tribes in the early 20th century, and gained further importance when the missionaries made Trio the language of evangelization. Today the various Trio sub-groups consider themselves Trio, with a shared history, culture, and –to a large extend- language.

In response to the question "to which of the different peoples/tribes (*jana* or *pï*) do you belong?", we found that particularly youngsters often just refer to themselves as Trio or – in the Trio language- Tarëno. Nevertheless, the majority of people (71 %) continue to identify with one of the Trio sub-groups, the most important of which are the Pïrëujana, Sakëtayana, Okomojana, and Sikijana. In addition, a smaller share of people in the Trio villages (12 %) claim an ethnic heritage belonging to one of the non-Trio indigenous groups such as the Wayana, Akuriyo, Arowak, Apalai, Waiwai, and Mawajana - a Waiwai sub-group. Figure 6.1 shows the ethnic background of the heads of household in the study sample, only listing those people of whom an ethnic affiliation could be recorded (N= 385).

Figure 6.1 Self-reported ethnic affiliation of male and female heads of household in the Suriname Trio villages.



6.2 Demographics

As explained in the previous section, people belonging to a variety of Trio subgroups as well as individuals belonging to other indigenous groups live in the Trio villages. Because the people living together in Trio communities all speak one language and predominantly share one culture, we counted any household with fixed residency in a Trio village as a Trio household. Within these households, we counted everyone as a Trio – even though some of these people strictly speaking belong to other groups.

We counted a total of 341 Suriname Trio households (excluding Palumeu). Approximately 1492 Trio inhabit these places, which probably host at least 90 percent of Suriname Trio. Not included at this stage were the Trio living in Palumeu and Paramaribo.

The average Trio woman in the sample has given birth to 3.53 children. This figures is consistent across all villages other than Sipaliwini, where for unknown reasons women had significantly more children (Mean = 5.2) than elsewhere (p#0.005). Households range in size from one person in the smallest to thirty persons in the largest household. The average Trio household (Mean = 4.25 people; excluding 2 outliers) is larger than the average household in Sipaliwini district (Mean = 3.44 people per household) and in Suriname as a whole (Mean = 3.94 people per household).

Our sample data suggest that 51 percent of the population consists of women and girls, which is consistent with the national population statistics. Seventeen percent of the

population consists of young children under the age of six. School aged children (ages 6 through 15) account for almost a quarter of the Trio population (24.2 %). The low number of children in this age group in Wanapan can be attributed to parents sending their children away for schooling, mostly in the Apoera area and occasionally to Kwamalasamutu.

Fifteen percent of the population are young adults ages 16 through 24. Girls in this age will find a partner and have their first child, while boys begin to take on the responsibility to supply their homes with bush meat, fish, and cash money. Nevertheless, these youngsters may still live with the parents and (partly) rely on them for food. Elderly (>60 years of age) account for 7.8 percent of the general Trio population.

Table 6.1. Population in the Suriname Trio villages

Village/ Kampu	**House-holds**	**People**	**Children (ages 0-15)**		**Adults**	**Elderly**	
		N	**Young ages 0-5**	**School-aged ages 6-15**	**Ages 16-59**	**Ages 60+**	**Unknown ages**
Corantijn River							
Sandlanding	7	33	8	6	19	0	0
Wanapan	9	34	19	1	6	4	4
Amotopo	6	15	1	2	9	1	2
Lucie	5	18	?	?	?	?	18
Kuruni River							
Kuruni	9	35	7	10	15	3	0
Sipaliwini River							
Sipaliwini	37	214	40	62	97	15	0
Kwamalasamutu	167	685	101	161	272	52	99
Alalapadu	15	65	12	13	30	9	1
Tapanahoni River							
Tëpu	86	393	76	106	169	32	10
Palumeu							
Total in Suriname	**341**	**1492**	**264**	**361**	**617**	**116**	**134**
Percentages		**100 %**	**17.7 %**	**24.2 %**	**41.4 %**	**7.8 %**	**9.0 %**

.

6.3 Education

6.3.1 National educational system

Suriname's educational system, which was among the best in the Caribbean in the 1970's, has suffered severely under the economic recession of the past three decades. The Inter American Development Bank recently classified the performance of Suriname education as poor, suffering from the misallocation of resources, inefficiencies and waste, and weak teaching capacity. In 2007, only slightly over half 50% of final-year high school students graduated.

Suriname still scores well on educational achievement indicators. Adult literacy is high (89.6%) Almost 6 percent of men (5.9%) and 10.5 percent of women ages 15 and older has not followed any formal education. These figures are relatively lower among younger people. Just over two percent of the population in the ages 15 and up is academically educated.

6.3.2 Access to education in the Trio area

Educational facilities and achievements in the Trio area stay far behind those in the coastal zone. Elementary schools in the forest lack the most basic resources such as sufficient and adequately paid teachers, a decent building, tables and chairs, writing materials, sanitary facilities, and electricity. Qualified teachers willing to work in the interior are rare and as a result, many children are taught by teachers who themselves may not have finished elementary school.

The example of Kwamalasamutu is telling. Only three out of 12 teachers at the Kwamalasamutu elementary school have teaching qualifications. Only one of these three, the headmistress, has been to the regular teaching collage. The other two have lower ranking qualifications; an abbreviated teacher training specifically for the interior. The nine non-certified men and women teaching at the school are named teaching-assistants but officially registered as 'development workers'. They are villagers with at least some years of education.

Still, in comparison with other places, Kwamalasamutu has a superior educational staff. In Tëpu, not one of the seven teachers has a nationally recognized teaching certificate or diploma. Many teachers at this school -all Trios- have not finished elementary school themselves and speak Dutch poorly. Their preparation for the job has consisted of a few months of teachers' training by Dutch pedagogy students. These Dutch interns were bought to Palumeu by the Kauffman Foundation in 2001. Because it was difficult for the female trainees to leave their families and agricultural fields for so long, the initiative was soon abandoned. In theory, the government was to take over responsibility for teachers' training afterwards, but in practice little has happened. According to the headmistress of the Tëpu elementary school, there has never been anyone from the Bureau of School Inspections or the Ministry of Education to Tëpu to assess the educational conditions.

The above-sketched situation applies to the places where children are lucky enough to have a school. This is not the case for children living in the Trio communities of Wanapan, Amotopo, Kuruni, Alalapadu, Lucie, and Sipaliwini. Each community deals with this lacuna in its own way.

Virtually all Wanapan families are sending their school-aged children to the Public Elementary school of Apoera, about one day traveling by motorized canoe downstream from the village. At the time of the research, five Trio children (ages 7 to 13) from Wanapan were living in Arowak foster homes in Apoera (4) and Washabo (1). One other Wanapan family was considering placing its two children, who are now attending school

in Kwamalasamutu, in Apoera the 2007-8 school year. In addition, two children ages 9 and 11 were living in Sandlanding with a relative.

Figure 6.2. Elementary schools in the Trio area

Sipaliwini

Kwamalasamutu

Tëpu

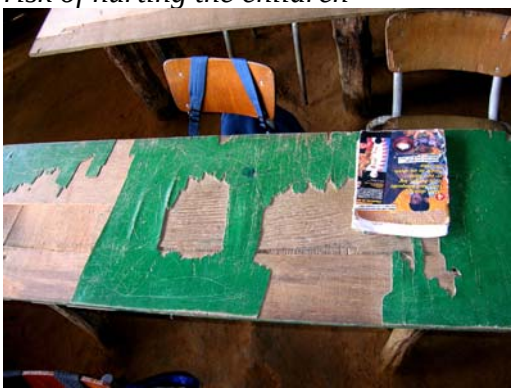
In the village of Sipaliwini, the village Kapitein has built and is managing a makeshift school since 2006. Two young women from the village are teaching approximately 30 children in two groups, four days a week. At the time of the research, one of these teachers had left the village because of food shortages. The Kapitein's initiative is laudable and the majority of parents are sending their children to the school. However, the two appointed teachers speak Dutch poorly and have no teaching experience. Requests for a proper school building with teachers' living quarters and a qualified teacher have been filed with both the Ministry of Education and the Community Development Fund Suriname (CDFS). To date no satisfactory response has been obtained from either of these institutions.

Children living in Amotopo, Lucie, Kuruni, and Alalapadu are not attending school at all. Some families from these places are sending children to either Kwamalasamutu or Paramaribo for education. Given the low population numbers in the named villages, it is unlikely that the Ministry of Education will place a teacher in any of these locations. The inhabitants of Alalapadu are planning to start their own school at the start of the 2007-8 school-year.

Access to Apoera's schools has been among the primary reasons for Wanapan families to move to Sandlanding. All eight children ages 5 and up from Sandlanding are attending school in Apoera. The Apoera elementary school is well maintained, has qualified teaches in all classes, and occasionally receives funding from BHP Billiton for extracurricular activities. The Sandlanding children reach the school by walking for one hour walk on a dirt trail along the harbor. Rainfall turns this path into a mud pool, and creates hazards at the harbor where heaps of sand and gravel lay around.

6.3.3 Educational facilities

Figure 6.3 Tables at the Kwamala-samutu elementary school present a risk of hurting the children



A child-friendly learning environment includes a school building that is comfortable and facilitates learning. Such a description does not fit the Kwamalasamutu elementary school with its leaking roof and collapsing furniture (Fig. 6.3). During the 2006-2007 school-year children have been unable to attend lessons during rainy days because they were getting wet. This situation should soon belong to the past, as a new school is being built with financial and technical support from the CDFS. The Tëpu elementary school and its interior also need renovation but we know of no plans to address this issue.

The Ministry of Education (MINOV) annually sends books, notebooks, and writing tools to schools in the interior but these materials are usually insufficient. The headmistress of the Tëpu elementary school named the lack of writing materials as one of the main problems plaguing the school. Children often come without a notebook and pen, and hence are unable to record anything in writing.

Various non-profit organizations and individual donors are helping the schools of the interior with materials. The 2006-7 school-year ACT sent several boxes of school supplies to Kwamalasamutu, Sipaliwini, and Alalapadu. The Roteract clubs Genisis and Paramaribo also donated school supplies to this school, facilitated by ACT-Suriname. The Dutch Foundation for Indigenous Peoples in Highland Suriname (*Stichting Inheemsen Boven-Suriname*) is supporting the Tëpu elementary school.

6.3.4 Educational achievement

Educational achievement in all Trio villages is low. Female heads of household have been, on average, just two years to school. This figure is barely surpassed by their husbands who have received a mean of 2.8 years of education. Only 13.7 percent of all heads of household has completed elementary school, and a mere six individuals among them report going beyond. Only one of these individuals has completed high school.

Comparison of the educational levels of older verses younger people shows that educational levels are climbing (Figure 6.4) – which is not surprising given the fact that public schools are a phenomenon of the past 30 to 40 years. Whereas older female heads of household (>= 30) have, on average, been schooled for just over a year, those younger than 30 have attained between 3 and 4 years of education. Similarly, younger men (< 30) have, on average, attended 2.6 more years of school than older men. Both differences are

significant at the 0.001 level. There is no significant difference between the various villages in the educational achievement of heads of household.

Figure 6.4 Mean educational achievement of the heads of household distinguished by age group

As children typically enter school only speaking their local language and because the parents typically do not have the educational background to help with homework, learning goes slowly and most children double classes. As a result most school-children are lagging behind various classes; it is no exception to find an 8-year old in kindergarten or a 12-year old in grade two. The headmistress of Kwamalasamutu estimated that about a quarter of boys and perhaps 5 to 10 percent of girls drop out prior to completing the six years of primary education. A common reason for dropout is (temporary) move of the family to elsewhere, particularly Brazil. If the family returns after some years it is difficult for the children to re-enter school.

Other children refuse to go to school out of fear for corporal punishment. This fear is in part created by parents, who like to threaten unruly children with punishment by the teachers. For another part, unfortunately, this fear is grounded, as some teaches are known to hit the school children. Yet others get married and/or have children before completing grade six. While some parents do force their children to attend school, others just keep the children at home when these do not want to attend anymore. Despite all the hurdles, in places where there is a school the grand majority of children (> 95%) is attending.

Because there are no secondary education facilities in the interior, few children from the interior enjoy higher education. Among those who are able to go on to school in Paramaribo, few eventually graduate and most fall back to low-level jobs.

6.3.5 Learning and training opportunities

Practical training opportunities for (young) adults are rare in all villages except for Kwamalasamutu. In Kwamalasamutu and Tëpu, where ACT is operating traditional health clinics, a few adults are being trained in the fabrication and application of indigenous forest medicine. ACT also has organized a variety of other workshops and trainings, the more recent ones of which are listed in Table 6.2. The majority of these learning opportunities take place in Kwamalasamutu. This places the inhabitants of the smaller communities, who already do not have access to a school, in a disadvantaged position.

Table 6.2 ACT delivered and/or funded workshops and trainings for the Trio in 2006-7

Workshop theme/title	**Location(s)**	**Participants**
The historic, legal, and political contexts of land- and resource rights	Kwamalasamutu, Paramaribo	Trio villagers particularly traditional authorities
Computer literacy	Paramaribo	Talawa (3)
Land management / park guards	Kwamalasamutu, Palumeu	All interested Trio
Administrative and Financial management	Kwamalasamutu	Stg. Nana (2), Stg. Meu (1), Talawa (3), others (18)
Administrative training for Brazil nuts center	Alalapadu (January 07)	Inhabitants of Alalapadu
Financial management (follow-up)	Kwamalasamutu	Stg. Nana, Stg. Meu, Talawa, others
Commercializing indigenous jewelry making	Kwamalasamutu	Women's group Stg. Nana,
Sustainable agriculture; dealing with agricultural pests	Kwamalasamutu, Tëpu, Amotopo	Trio villagers, particularly women
Fairs and production presentation – development of a crafts market	Paramaribo (July 26, 07)	Chair of women's group Nana from Kwamalasamutu
Legal representation	Paramaribo (March 2006)	TALAWA
Maintenance of solar powered batteries	Kwamalasamutu, Tëpu (annually)	ACT staff
Outboard motor maintenance	Kwamalasamutu (annually)	ACT staff

In Kwamalasamutu, Conservation International (CI) is working with Stg. Meu to facilitate access to training by third parties. For example, it has brought Stg. Meu in contact with the Community Development Fund Suriname (CDFS), whose trainers have organized a chainsaw operation training. Other anticipated trainings will deal with tourism development and include cooking for tourists and tour guiding. These trainings should allow the participants to develop an individual business, such as a cantina/restaurant.

In Tëpu, Mr. C. Coelewijn, a former teacher who worked for more than 8 years in the village, is teaching the members of *Stichting Jaraware* in typing and basic computer

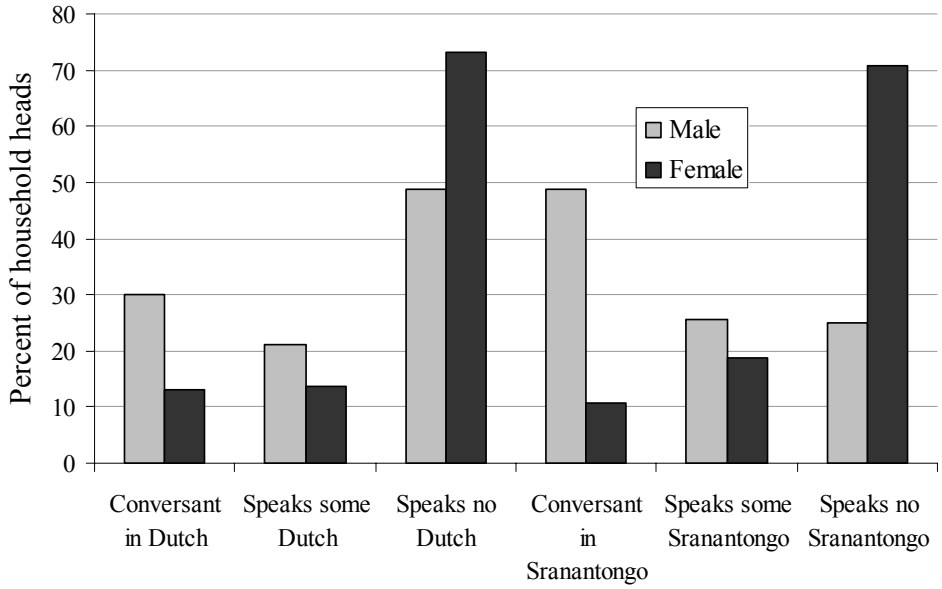
literacy. This Stichting also manages a library with resources to learn Dutch and obtain information about a variety of topics.

The Medical Mission PHS is training local people as health assistants in communities where it has a clinic. This training involves two years of nursing training in the Trio language in the village. The local training is followed by a short-course by a medical doctor in the city in Dutch.

6.3.6 Language skills and literacy

Among Trio virtually the only language spoken is the Trio language; more than 90 percent of Trio household heads in our sample named the Trio language as their mother tongue. Another 2.5 percent of respondents reported being raised in both Trio and another language, such as Wayana, Sikijana, and Kutajana. Twenty-six individuals (6.7 %) having been raised in another language (n=378). Their mother tongues were Apalai (8 p.), Wayana (7 p.), Akuriyo (4 p.), Waiwai (4 p.), English (2 p.), and Arowak (1 p.). In addition, there is at least one Mawajana-speaking couple in Kwamalasamutu that was not sampled. Mawajana and Akuriyo are among the few still living language in the Trio villages.

Figure 6.5 Language skills of male and female heads of household



As soon as Trios leave their homelands they need to use either Dutch or Sranantongo to make themselves understandable to non-Trio. Because men are more likely to travel to the city and speak with outsiders, they tend to be more skilled in these languages than women. Almost half (48.9 %) of male heads of household in the sample said they were conversant in Sranantongo and a quarter (25.5 %) reported speaking the national lingua franca a little. In comparison, less than a third of women reported to be speaking a lot of (10.6 %) or a little (18.7 %) Sranantongo. Dutch language skills are even less common;

almost half of male (48.9) and three-quarters of female (73.1 %) heads of household reports not to be speaking the national language at all (Figure 6.5).

Despite their low educational levels, most Trios can read and write in their own language – a heritage of several decades of missionary education. Eighty-thee percent of male and 67.1 percent of female heads of household reported literacy in the Trio language. Not surprisingly, literacy in Dutch is lower; 41.4 % of male and 22.2 %, of female heads of household can read and write some Dutch.

6.2 Health

6.2.1 National health provisions

The Surinamese Ministry of Health is primarily occupied with monitoring and policy. The practical delivery of public health care is almost entirely in hands of two semi-autonomous institutions: Regional Health Service (RGD) and the Medical Mission Primary Health Care, Suriname – better known as MZ. This latter organization delivers health care to the inhabitants of the interior.

In the capital city of Paramaribo and to some extend the coastal districts, access to health care is decent. Medical care is free for the lowest income groups; the annual vaccination program reaches most urban children; and there is an established foreign-trained population of medical doctors. In the forested interior, however, clinics are consistently short of beds, personnel, equipment, and medications. Moreover, for many people the nearest clinic may be several hours or days of travel away.

6.2.2 Primary health care in the interior: the Medical Mission

Medical care in the interior is provided by the Medical Mission Primary Health Care – Suriname (*Medische Zending- MZ*); a multi-denominational non-profit organization which acts as an umbrella for three Christian Missionary Foundations. The MZ delivers free health care to the approximately 50,000 people living in the interior through 49 health clinics. Outsiders pay a small fee. MZ clinics are staffed by Community Health Assistants, who are trained health care providers who mostly originate from the communities they serve. Serious cases are transported to Paramaribo by airplane or boat. Access to the private Diakonessen Hospital is part of the services delivered by the MZ. This hospital has reserved 100 beds to meet the medical needs of patients from the interior.

The Medical Mission's exploitation costs are fully funded by the Ministry of Health. Other expenses (Approx. 20 % of total costs) are covered by donors such as the European Union (STD prevention program), PAHO (Roll Back Malaria), Rotary International (Bed netting project), WHO, Dutch Treaty Funds, Stichting Lobi, and Family Health International (Reproductive health) among others. The cost of hospitalization is covered by the Ministry of Social Affairs, while the expenses of the health care in the interior are subsidized by the

Ministry of Health. In practice, the government often fails to comply with its obligations to both the hospital and the rural clinics, which repetitively leads to severe cash flow problems and even near bankruptcy of these health care providers.

In 2006 and 2007 many of the old MZ clinics were renovated. In the study area, the villages of Kwamalasamutu, Sipaliwini, Alalapadu, and Tëpu have an MZ clinic, while a new clinic is being built in Kuruni. The number of health care providers in these clinics, naturally, depends on the size of the village (Table 6.3). The clinics of Alalapadu and Kuruni are managed by rotating nurses from Kwamalasamutu. Local people from these villages are receiving training to be stationed at the new clinics. A health workers' training consists of two years of practical training in the local language in one of the MZ clinics. This local training is followed by a Dutch-language training provided by a medical doctor in Paramaribo.

Table 6.3 Number of health care providers in the Trio villages that host an MZ clinic

Village (Year established)	Health workers	Clinic assistants	Lab assistants	Total
Kwamalasamutu	3	1	1	5
Tëpu (1966)	2	1	0	3
Sipaliwini	1	0	0	1
Alalapadu (2006)	1 (rotating)	0	0	1
Kuruni (2007)	1 (rotating)	0	0	1

However, not all Trios have easy access to these clinics. The inhabitants of Wanapan, Amotopo, and Kuruni live on a full day's travel by motorized canoe from the nearest clinic. In order to receive prenatal care, pregnant women temporarily move to places closer to a clinic, such as Sandlanding (near the Apoera clinic) for the Wanapan Trios and Kurunu for the people from Amotopo/Lucie. People from the above-named villages that unexpectedly get ill, however, cannot obtain emergency medical assistance. Moreover, when there is no fuel, which given their distance from the city occurs frequently, they are not able to visit a doctor all. This situation presents a severe health risk.

6.2.3 Traditional healing

The pïjai and other traditional healers

Shamans and their traditional healing practices have been central to the lives of Suriname's Indigenous peoples since pre-Columbian times. The *pïjai* or shaman uses a variety of methods to treat sick people. In addition to making medicine from curative herbs and plants, the healing process may include shamanic dreams in which the forest spirits advice the pïjai; smoking to communicate with the spirits; the transformation of the shaman into different appearances (e.g. a jaguar) to visit accompanying spirits villages; and massage. The shaman also may suck arrows, bones or fragments from one's body. These items have been shot into the body by malevolent spirits.

With the arrival of US missionaries and the conversion of the Trio to Baptism, holistic healing practices were considered pagan rituals and unacceptable. By that time, the Trio were suffering from infectious diseases that had been bought to them by outsiders and decimated their numbers. The shamans were powerless against diseases such as the flu and malaria. By providing Western medicine –which could cure the sick- the missionaries demonstrated the superiority of Western culture and their God over the indigenous tradition. The pïjai men were portrayed as to be working with Satan and black magic. They lost their central role in society and even were seen as undesirable elements of the Trio community[21]. Many pïjai men themselves became convinced that they had been working with evil forces, which had to be stopped. Some committed suicide. Others openly denounced their ancient powers by throwing their curing instruments (e.g. the rattle) into the river or handing them to the missionaries in the hope that the spirits would not visit them again.

Today the remaining healers say that the spirits no longer visit them; curing is strictly based on the use of plant materials (Wilbrink 2007). They are *ëpi (wo)men* (natural healer) rather than *pïjai men*. Likewise villagers attest that spirits are not allowed to enter the community anymore – which is not the same as to say that they do not exist. Indeed, Wilbrink's analysis of indigenous healing practices in Kwamalasamutu quotes several villagers who refer to supernatural forces that recently caused illness and death. These spirits may or may not be sent to the victim by someone else.

Apart from the few remaining shamans, surprisingly few people in the Trio villages know how to make forest medicines. Even Paramaribo's city people use plants from their gardens and surroundings to treat minor ailments such as colds, coughing, diarrhea, cuts, and skin problems. Hardly anyone from the Trio villages, however, had made forest medicine to treat the latest illness of him/herself or family members. In the villages without a MZ clinic or ACT clinic (see below), people said they just waited to become better or else traveled a long distance to the nearest clinic. We suspect that their aversion against Pïjai has caused the Trio to abandon all traditional healing practices. However, their inability to use the forest to treat even the simplest diseases leaves the Trio - particularly those living far from the regular clinics- extremely vulnerable to illness events.

The shaman's apprentice program

In July 2000, the Amazon Conservation Team-Suriname (ACT) with the Trio initiated the shaman's apprentice program in the village of Kwamalasamutu to promote the preservation of traditional medicinal and other knowledge. In 2001, the program was extended to Tëpu. Through this program young apprentices learn from the elder shamans about plant-based medicine. These people are trained to be ëpiman rather than pïjai, due to negative association with the latter. The traditional health clinics are operated by shamans, senior apprentices, and junior apprentices, who are diagnosing and treating patients on a daily basis. Operational costs and salaries of the clinic workers are covered by ACT.

[21] Plotkin (1993) describes this process in more detail. See also Wilbrink 2007

In 2006 ACT opened the *Okoij traditional school* where children are taught about traditional knowledge and skills after their regular school classes. The school was named after one of the village's eldest and most knowledgeable living shamans. Once weekly, the apprentices teach at the traditional school about pants and their medicinal applications.

In 2007, ACT inaugurated the *Supuemë traditional hospital* in Kwamalasamutu, named after a curative plant. In this mini-hospital, which is still being completed, patients will be able to remain for some days for treatment.

6.2.4 Other specialized health programs in Trio communities

In 2004-5, as part of a nation-wide program on Sexual and Reproductive Health (SRH), the United Nations Population Fund (UNFPA) in collaboration with the Ministry of Public Health upgraded the skills of all MZ health workers in the area of SRH. In 2006, a group of volunteers from selected villages (+ 16 per village) were trained to raise community awareness about community-specific SRH-related problems. Apart from two presentations in the school and the church, the volunteers from Kwamalasamutu have not been active ever since.

The National Aids Program (NAP) of Suriname has not been active in the southern Indigenous villages and appears poorly informed about the situation in these communities. According to the prevention coordinator, the NAP will perform needs assessments in selected villages in the interior starting August 2007. Based upon these needs assessments, a possible intervention campaign may be designed and executed in collaboration with other organizations working in the area.

6.2.5 Most common health problems

When asked about recent illnesses in their families the respondents most frequently listed having a cold or the flu – or its symptoms such as coughing. Other often listed health problems include, from the most to the least mentioned: malaria, stomach aches, diarrhea, a head ache, TBC, back problems, and weakness due to old age. This list concurs with the MZ's list of most pertinent health problems in the Trio community. In its clinics at Kwamalasamutu, Sipaliwini, Palumeu, and Tëpu, the MZ registered in the order of importance[22]:

1. Upper respiratory tract infections
2. Lower respiratory tract infections
3. Watery diarrhea
4. Malaria
5. Dysentery

In addition, the ACT health clinics of Kwamalasamutu and Tëpu receive many patients with viral, bacterial, and parasitic infections.

[22] Source: Primary Health Care Suriname/Medische Zending, pers. com. June 2007

Particularly children regularly suffer from diarrhea and dysentery. These conditions are more common in the dry season when Trio families rely on the river for drinking water (See Ch. 5 on water quality).

Malaria used to be one of the main causes of illness in the study area. In 2006 this disease dropped to the fourth rank thanks to a persistent malaria prevention campaign executed by the MZ and funded by the Global Fund (See Ch. 8.6)

Many Trios are suffering from various types of intestinal worms. In addition, infection-related skin problems, such as white spots and sours, are common in the study population. A particularly serious and common group of parasitic diseases is leishmaniases. Virtually all infections appearing in Suriname are coetaneous, meaning they affect the skin. Coetaneous leishmaniasis usually produces skin ulcers on the exposed parts of the body, such as the face, arms and legs, causing serious disability and leaving the patient permanently scarred.

Two health issues that are not recorded in the MZ statistics but warrant attention are nutritional health and the sexual and reproductive health of particularly young girls. We will discuss these conditions in the next sections.

6.2.6 Nutritional health

In both 2006 and 2007, particularly in the months of May, alarming reports about food shortages in the Trio community repetitively reached the city. According to the Trio authorities, the cassava harvests had failed due to a combination of heavy rainfall, which flooded and/or saturated of the agricultural plots and leafcutter ants that attacked the cassava plants (see also Chapter 5). Only very small and half-rotten cassava roots were left to be harvested, they reported. In June 2007 Trio Granman Alalaparoe Ashongo traveled to the capital city to discuss the problem with the Central Government, proclaiming that he would not return to his village with food aid.

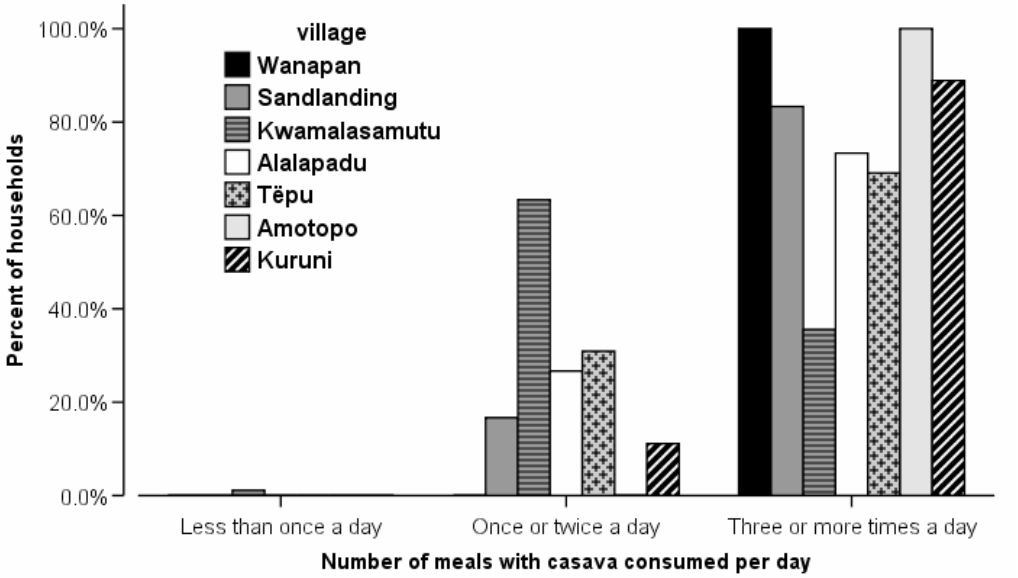
Both the Suriname Government (Ministry of Regional Development) and NGOs (i.e. Canada Fund, ACT) responded to the desperate calls from the Trio community by sending *kwak* (dried cassava crumbs) and rice, primarily Kwamalasamutu and some smaller villages such Sipaliwini. However, to date none of the donor agencies has performed an objective assessment of the severity of the food shortage in Kwamalasamutu and other villages. How many families did not have anything to eat, and for how many days? Have cases of malnutrition been recorded as a result of the poor harvests?

Figure 6.6 Children in Sipaliwini bring food-aid sent by ACT to their village

The frequency of kasiri parties in Kwamalasamutu throughout the period of scarcity suggests that the lack of cassava was slightly dramatized. The poor cassava harvest could also partly be compensated by eating other sources of carbohydrates, such as sweet potatoe variations and corn. In Sipaliwini, where we did find a shortage of cassava, people had resorted to fish and bush meat. In none of the villages the team observed children that looked malnourished or weakened due to a lack of food.

We asked the heads of household how often they eat cassava (Figure 6.7). The grand majority of people in all villages apart from Kwamalasamutu has a cassava meal at least three times a day. In the more isolated villages (i.e. Wanapan, Amotopo), where rice and bread are hard to get by, a 100 percent of households is eating cassava 'all day long'. The lesser amount of cassava eaten in Kwamalasamutu may be a result of harvest failure, but also could reflect of the greater variety of foods available in this village.

Figure 6.7 Daily number of cassava meals consumed by the households

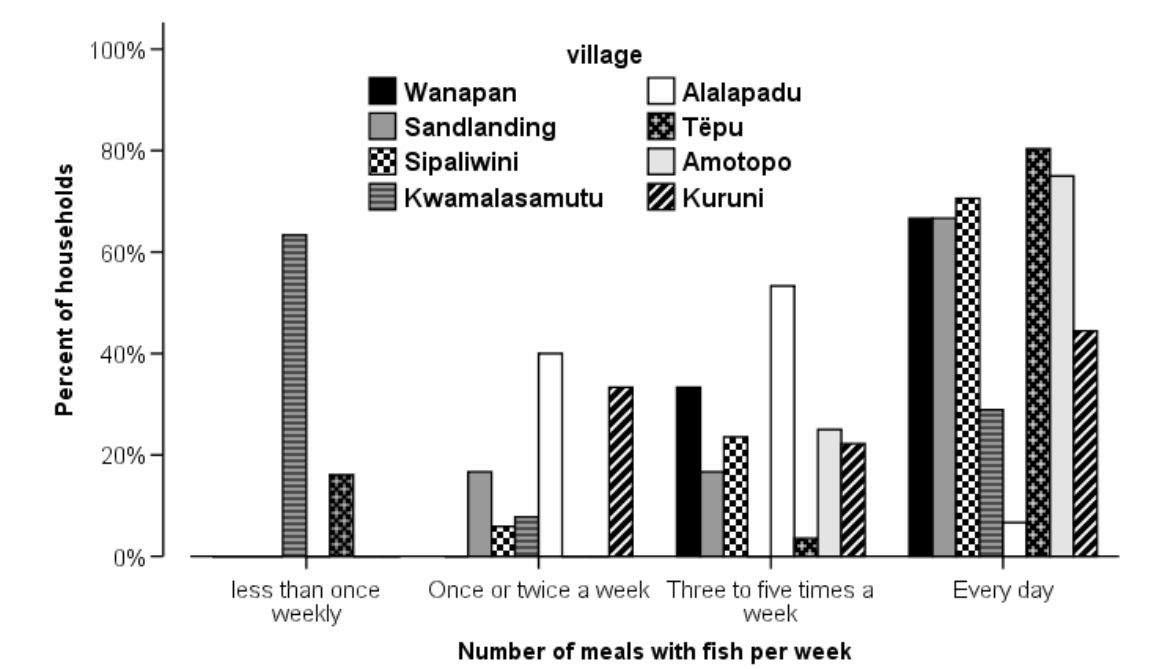


When we asked the heads of household how many days in the past month they had not eaten anything, close to ninety percent (88.1 %) responded that they had been eating every single day. Only five percent of households reported having spent more than one day in the past month without food. Of course every single hungry family is one too much, but to speak of a community- or tribe-wide famine seems exaggerated.

Interview data and observations suggest that there are indeed nutritional problems in the Trio community, but that these have more to do with the quality than with the quantity of food-intake. The Trio diet is rich in carbohydrates but may not meet the daily requirements for several important vitamins and minerals. Many women suffer from iron and hemoglobin deficiency; probably a result of the lack of iron-rich meats (red meat, poultry), beans, whole grains, and leafy greens in the Trio diet. These deficiencies are particularly severe in pregnant, menstruating, and lactating women due to their greater mineral needs.

Pregnant and nursing women also are unlikely to meet their daily calcium requirements due to the lack of milk, milk products, and other sources of calcium in the Trio diet. One of the health workers at Tëpu expressed concern about malnutrition among infants and young children due to, among others, nutritional deficiencies in women. One manifestation of vitamin and mineral deficiencies is retarded growth in children. We do not know if this effect occurs in the Trio population. The MZ is providing vitamin pills and dietary advice to pregnant women.

Figure 6.8 Number of meals with fish consumed in one week by the household members

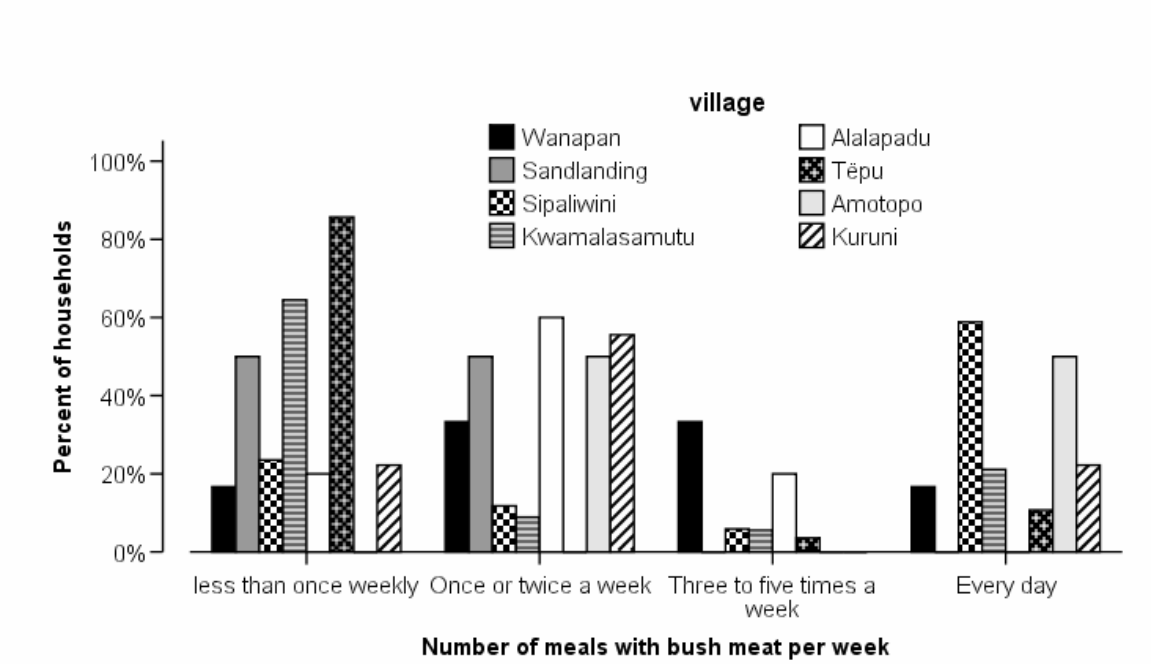


Despite its better access to the city, our results suggest that nutritional quality is poorer in Kwamalasamutu than in the other Trio villages. When we look at the consumption of fish, an important source of protein and minerals, we find that more than 60 percent of Kwamalasamutu households eats fish less than one a week. Less than a third (28.9 %) of households in this community eats fish at least every other day. In comparison, between 60 and 100 percent of households in the other villages eat fish at east three times a week, and usually more.

Generally, bushmeat is eaten less frequently than fish as it is harder to find. Self-reported dietary data suggest that inhabitants of the two largest communities, along with the people from Sandlanding, eat the least game (Figure 6.9). This result may at least partly be explained by resource depletion in the most densely populated areas. The Trio from Wanapan, Sipaliwini, and Amotopo eat relatively most meat. Because fresh fish and bush meat are virtually the only sources of protein and essential minerals available to the Trio, one may expect nutritional deficiencies in the population of places where these food items have become scarce. As far as we know, no-one has ever conducted an in-depth

nutritional and anthropometric survey in the Trio community to assess dietary quality and its effects on both child development and adult health.

Figure 6.9 Frequency of bush meat consumption in Trio households

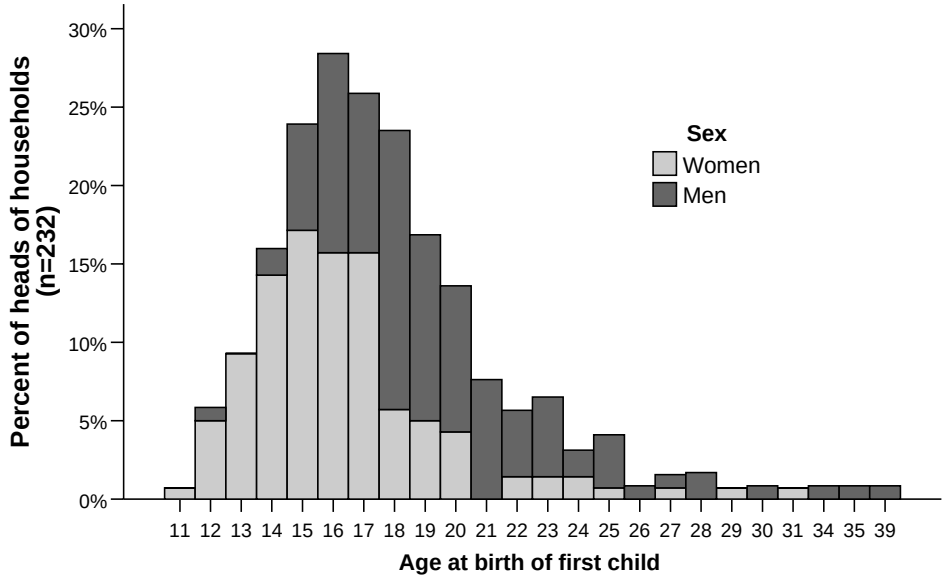


6.2.7 Sexual and reproductive health

Among Amazon indigenous peoples it is customary for people, particularly girls, to be married and have children at a young age. We asked the male and female heads of household in our sample about their age at the time that they had their first child. In a society where people are -until recently- not used to recording their ages or celebrating birthdays, it is not surprising that only 57 percent of male and female respondents knew how old they were when their first child was born.

Our results show that girls tend to be younger than boys when they deliver their first child. The youngest mother was 11 years old when she had her first baby; the oldest first-time mother was 31. Male heads of household were between 12 and 39 years of age when they became a father for the first time. The median age to have a first baby is 16 for girls and 18 for boys.

Figure 6.10 Reported age of the household head (M/F) at the birth of his or her first child

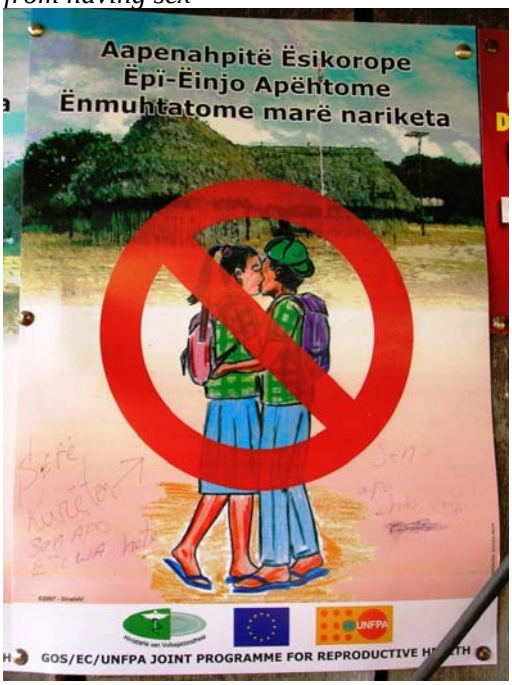


Early motherhood is integral to the traditional Trio culture but not necessarily healthy. A substantial body of research suggests that particularly younger teenage girls are not physically ready for parenthood. The 2004 fifth annual State of the World's Mothers report, published by the international charity Save the Children, finds that girls aged 15 to 19 are twice as likely as older women to die from causes related to pregnancy and childbirth[23]. The youngest mothers -those aged 14 and under- face the greatest risks. Research from Bangladesh, for example, shows that the risk of maternal mortality is five times higher for mothers aged 10 to 14 than for mothers aged 20 to 24.

Not only young mothers are at risk but also their un- and newly born babies. Studies have found that offspring of adolescent mothers aged 15 and younger are at a substantially higher risk of low birth weight and infant mortality than infants born to slightly older mothers[24]. Babies of mothers aged 15 to 19 in low-income countries are 50% more likely to die than children born to women in their 20s. Neonates born to these young mothers also have been found to be more likely to have a low Apgar scores; a standardized health test for newborn babies[25]. These results are consistent when controlling for confounding factors such as socioeconomic class, ethnic/racial background, and access to adequate prenatal care. The UNFPA has distributed educational posters in Kwamalasamutu to convince children to abstain from having sex, but we do not know how much impact these pamphlets have at on actual behavior (Figure 6.5).

[23] Mayor 2004
[24] See e.g. Friede et al. 1987; Phipps et al. 2002;
[25] Xi-Kuan 2007

Figure 6.7 Educational poster urging elementary school children to abstain from having sex



As anywhere, few Trio children wait for marriage to become sexually active. Most adolescents have had their first sexual experience before the age of fifteen and before they have a formal spouse. Given the low rate of contraceptive use, many young girls end up pregnant from these casual relationships. Trio customary rules prescribe that a young man who impregnates a girl marries her, unless he is deemed an unacceptable candidate by her parents. This may be the case when the girl has been promised to another man or if the suspected father has a poor reputation. Girls and adults complained, however, that young men nowadays no longer take their responsibilities and simply leave the girl to fend for herself. Particularly in the larger villages of Tëpu and Kwamalasamutu, this trend has resulted in a growing number of single mothers -usually young girls- who rely on their parents to take care of them and their babies.

Apart from receiving a beating from her parents or other caretakers, to have a baby out of wedlock reduces a girls' options to marry a respectable young man of her liking. Hence many girls prematurely terminate their pregnancy once they find out they are pregnant from the 'wrong' man. It must be stated though that abortions are not just performed by young girls. Extramarital relationships are rather common among both women and men, and also older women ending up pregnant may decide to abort. Abortions are not unheard of in the traditional Trio culture. However, the rate at which abortions are performed today is unmatched and was identified as a severe reproductive health hazard by health workers in Kwamalasamutu and Tëpu. A recent survey by the UNFPA in the community of Kwamalasamutu also identified unsafe abortions and early teen pregnancies as a main problem.

In order to abort an unwanted fetus women use forest medicine; they try to squeeze it out; and/or they stick a long sharp straw into their uterus. By doing so several girls have gotten infections and inflammation of the uterus. In a few cases their condition was so severe that they had to be transported to the capital city for medical treatment. These home-abortion practices present a health hazard and jeopardize the girls' ability to have healthy children on a later age.

An addition factor that may harm the health of newborns is the Trio's traditional preference for consanguine marriages; relationships between two blood relatives. Culturally the ideal partner is a cross-cousin, that is, the child of one's father's sister or

the child of the mother's brother. Medical research provides substantial evidence to suggest that neonates born from consanguine relationships have higher chances of being still-born or dying before they have reached the age of one. These children also have an increased chance to suffer from birth defects[26].

We can conclude that various cultural, socioeconomic, behavioral, and emotional factors in the Trio community present risks to the health of expecting mothers, their unborn babies, and their infants and children. Yet without rigorous medical research it is impossible to say whether, how, and how severely these risk factors impact maternal and neonatal health. Over the past five years in Kwamalasamutu, for example, three infants (< age 1) and four children under the age of five passed away, while two babies were still-born[27]. Without a scientific population study that compares longitudinal data of pregnant women and their offspring, suggestions about the causal effects of these deaths remain speculations.

Another issue affecting sexual health in the Trio community is commercial sex work, both in and outside of the villages. In most villages a couple of young men are temporary working in the small-scale gold mining areas of the Lawa region. In the mining camps, a male-dominated society, they come in contact with commercial sex workers, most of whom originate from Brazil and the Dominican Republic. There are strong indications that Trio men also make use of the services offered by these women. As far as we know no-one has researched the prevalence rates of Sexually Transmitted Infections (STI's) including HIV/AIDS in this population but, given their working conditions, it is likely to be high. Hence the Trio clients of these sex workers present a risk to the community.

A relatively new phenomenon in the Trio villages is commercial sex offered by Trio girls. That girls occasionally sleep with men who have to offer certain economic benefits in cash or kind (e.g. rice, meat) is not new. The presence of girls who are known to have sex with any man paying the right price, however, is -as far as we know- novel. We even have recorded the presence of street prostitution in Kwamalasamutu. We do not know whether these girls offer unprotected sex, but the overall low incidence of condom use in the community makes it unlikely that appropriate protection is used at all times.

Protection is most certainly not used during rape. Each year several cases of sexual molest, rape, and/or gang-rape of particularly young girls are reported in Kwamalasamutu, and possibly in the other villages. Because these incidences tend to be covered up by the traditional authorities and dealt with within family circles, it is impossible to say how often it happens and how many girls have been victims.

The young age of sexual activity, the high incidence of casual sexual relationships, the use of commercial sex within and outside of the village, and the low tendency to use condoms make the Trio community extremely vulnerable to the spread of HIV/AIDS. The MZ has delivered HIV/AIDS awareness presentations in some of the villages and distributes condoms at no cost and are now. However, the lack of familiarity with

[26] E.g. Grant and Bittles 1997; Stoltenberg et al. 1999
[27] Data obtained in July '07 from the Kwamalasamutu MZ clinic.

condoms in the Trio culture; the continued aversion against condoms among Suriname men; and the limited of privacy in the small forest clinics - where the nurse is likely to be an aunt - lead us to believe that very few couples are consistently practicing safe sex.

At a national level, AIDS has already become the second most frequent cause of death for people in the 15-44 age bracket. The MZ health workers, who have all pregnant women tested on HIV, listed not one HIV-positive patient in the Trio villages as of August 2007. However, at least one Trio AIDS-patient was hospitalized in Paramaribo at the time of the research. Some informants attested that a woman from one of the smaller villages died from AIDS, but others denied that the cause of her death was HIV/AIDS. Given the prevalence of high-risk behavior, an intensive HIV/AIDS awareness campaign targeting the Trio community and customized to the Trio culture should be a priority of both the NAP and other organizations with a mission to protect and improve the sexual and reproductive health in Suriname.

6.3 Religion

In 1959 the Suriname government granted the US 'Door-to-Life Gospel Mission' permission to work among the Trio Indigenous group. In 1960 missionaries from this denomination, headed by Claude Levitt, first made contact with the Trio in the Sipaliwini watershed. In 1961 evangelizing activities started. In 1962 the 'Door-to-Life' organization was taken over by the 'West-Indies Mission', a US-based missionary group operating in Suriname under the name 'Suriname Interior Fellowship' and, since 1978, the 'World Team'.

Today, all male and female heads of Trio households report being Baptist. We do not know whether really every single individual is a devoted believer, or whether some were stating the socially desirable answer out of fear for a reprimand by the traditional authorities or –worse- the austere Almighty. The fact is that the two religions dominating other parts of the Suriname interior, Monrovian (EBG) and Roman Catholic, have no followers among the Trio. Neither did anyone report to belong to the newer denominations currently winning souls in the interior, such as the Jehovah's Witnesses, Mormons, or smaller protestant groups. A group of Islamic missionaries wanting to build a church in Kwamalasamutu was sent home by the Granman.

Believers meet frequently. The church of Kwamalasamutu holds a service on Monday, Tuesday, Thursday, and Friday mornings between 7 and 8 am, and on Sundays from 8 to 12 am. In addition, afternoon services being held on Sunday (3-5 pm.) and some other afternoons. Likewise in Alalapadu, Kuruni, Tëpu, and Sipaliwini, sermons are being delivered several mornings a week in a church building. No morning service is held in these villages on the Wednesdays and Saturdays, which are the designated hunting days.

In the absence of a church building in the villages of Wanapan and Amotopo, the villagers themselves regularly hold church services; reportedly every Sunday. Neither

does Sandlanding have a church. In this settlement religion is not practiced communally, though individual members attest to being practicing within their homes.

Even though not all Trios regularly attend church, the general Trio population demonstrates an aversion against anything to do with traditional cosmology and virtually no-one still practices traditional ceremonies. The original Baptist church was very strict in its teachings, but the institution has become slightly more open to the Trio culture in recent years, after the departure of the US missionaries. In the past two years, with quite some encouragement from outside, the Trio have been celebrating specific events such as (inter)national Indigenous day (August 9) with traditional dress, dances, and music. For particularly the adolescents and children, it was the first time in their lives that they celebrated their indigenous culture.

CHAPTER 7
SOCIAL CAPITAL

In this chapter we look at interpersonal relations and community-wide social structures that shape life in Trio society. We first take a look at formal political organization at the national and local levels. Next, section 7.2 focuses on non-political organization in national and community-based interest groups. Subsequently we discuss incidences of crime and violence that jeopardize social stability, as well as the ways that Trios respond to deviant behavior. Here we pay special attention to the recent formation of an indigenous park guards unit. Socializing and participation in leisure activities are key to building harmonious relations; they are the focus of section 7.5. The last section of this chapter assesses the presence and efficiency of formal and informal social safety nets.

7.1 Political organization

7.1.1 National political administration

The Republic of Suriname is a constitutional democracy, by the constitution of 1987. The 51 members of the National Assembly are elected by popular vote. The president is elected by a two-thirds majority of the National Assembly or, if they cannot come to an agreement, by a majority of the People's Assembly. Usually he (there have not been any female presidents) is the leader of the party that gained the majority of votes during the elections. He appoints a cabinet of ministers from the members of the National Assembly. The vice president is elected by a majority vote in the National Assembly or People's Assembly. These different branches of the government (National Assembly, President, Vice-president, and ministers) are simultaneously elected for a five-year term. A State Advisory Council with 15 representatives from the elected parties, the unions, and employers' organizations, advices the president in policy matters.

The nation is separated into 10 administrative districts. The interior of Suriname primarily covers two districts: Brokopondo and Sipaliwini. The vast district of Sipaliwini, where the Trio live, does not have a capital city or administrative center. The office of the local government representative, the District Commissioner of Sipaliwini, is located in Paramaribo on the Zwartenhovenbrugstraat, far removed from the people who depend on its services.

7.1.2 Local governance

The Trio are officially represented in national affairs by their local authorities, though not all people admitted in these functions by the Granman are recognized as such by the central government. The highest traditional position among the Trio is that of G*ranman* (Paramount chief). Current Granman Asongo Alalaparoe was inaugurated on January 15,

1997, and seated in the Kwamalasamutu. All villages are headed by a *Kapitein* (Kapitein; village or clan head) and/or *Hoofdkapitein* (head-Kapitein; head of a larger cluster of villages or clans), who is assisted by *Basjas*; administrative assistants. Decision-making about issues affecting the entire village is based on consent and may take days of gatherings or *krutus*[28]. Traditional authorities and elderly facilitate these meetings, but usually anyone may speak out.

In the village of Sandlanding the situation is a little different. This settlement is located on Arowak lands as a satellite village of Wanapan. Hence the Trios of Sandlanding fall officially under the custody of Kapitein Alapate of Wanapan. Yet because of the large distance and lack of communication facilities between Sandlanding and Wanapan, Kapitein Alapate and Kapitein Lewis of Apoera have agreed that in the case of problems or needs, the Sandlanding Trio will appeal to the latter. Also possible resettlement should be discussed with the Kapitein of Apoera.

One facet paralyzing the day-to-day works of the traditional authorities is their lack of administrative resources and an operational budget. The Granman and his Kapiteins have no offices, except for the Granman who built an office at Kwamalasamutu with support of ACT. The traditional authorities also lack transportation means (e.g. boat, outboard motor, fuel), writing materials, and/or communication tools (i.e. radio) other than those supplied by NGOs or visiting government delegations -usually in anticipation of the elections. Hence if Trio leaders want to discuss matters personally with government officials; build liaisons with national interest groups; seek donor assistance; or invest in community development, they first need to seek money from third parties. Transferring part of the funds for development of the interior to the traditional authorities would, with proper financial and administrative support, be a logical outcome of the Government of Suriname's current decentralization efforts.

7.1.3 Relations between traditional authorities and the nation state

The relationship between traditional authorities and the nation state is not defined by law but has developed based on custom, oral agreements, and practical considerations. The government Ministry responsible for coordination of all government activities in the interior is the Ministry of Regional Development (*Regionale Ontwikkeling*, RO), particularly its Division for the Interior (*Directoraat Binnenland*) (Figure 7.1). This Division, in turn, supervises the Districts Commissioner's office (Districts Commissariaat, DC). The DC serves as an intermediary between the Government of Suriname and the people and authorities of the interior, who may approach the DC in person, though the elected Districts and Resort Councils, and through the appointed Governmental Inspectors (Bestuurs Opzichters, BO).

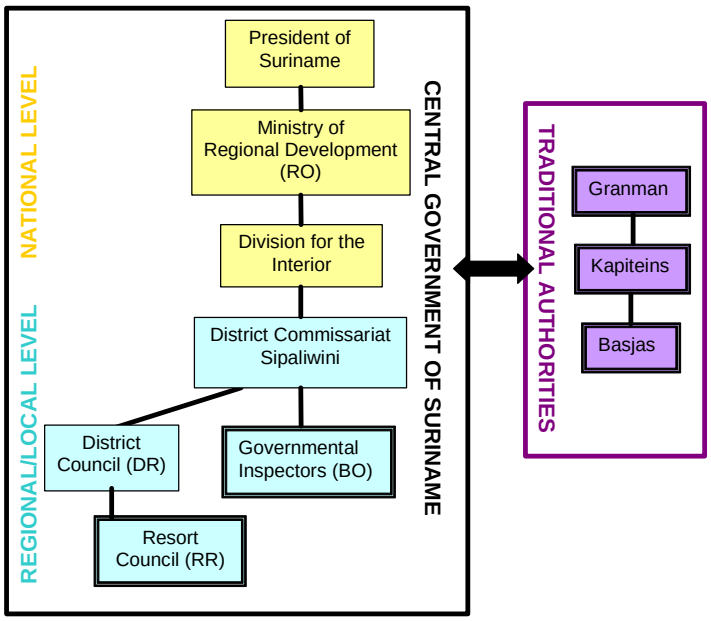
The traditional authorities do not fall under any particular Ministry or government office, but rather function as a separate entity (Figure 7.1). Their communication with the

[28] IDB 2004

government frequently occurs by means of the DC, but it is not uncommon that the highest tribal authorities address the Minister of RO even the President in person.

Traditional authorities receive a public honorarium and are accountable to the national government[29]. However, it remains unclear what this accountability means in practice and who is responsible for the administration of day-to-day community affairs. The resort council is authorized by law but in practice the customary authorities exert leadership and have virtually no contact with the council. The immobility of the resort council members is reinforced by their limited travel allowances.

Figure 7.1 Relationship between Central Government offices and traditional authorities in Suriname. The thickly-lined boxes have Trio representation.



Another undefined matter is the level of authority that may be exerted by the Granman and his support staff. For example, there are no clear rules on how traditional authorities should handle crime. Hence offenders are punished according to personal discretion of the village authorities and their advisors. This situation violates the basic human rights of both crime victims and perpetrators. Victims of rape or child abuse may feel threatened because their attackers are frequently left unpunished. On the other hand, arbitrary (corporal) punishment of the wrongdoer may be excessive or against international agreements.

Apart from the traditional authorities and two B.O.'s, whose power is very limited, the Trio have no representation in the national government and, as a consequence, virtually no voice in political decision-making. No single Trio individual has obtained a high political function during the 2005 elections, such as minister or member of the National Assembly or State Advisory Council, let alone president or vice-president. In a country like Suriname, where personal alliances and ethnicity-based favoritism continue to play an important role in political strategizing, groups without direct representation in the national government are likely to be forgotten.

Women are underrepresented in this system. Apart from the director of the Division for the Interior and a few female Basjas, all top-level functions are fulfilled by men.

[29] See ACT 2003a for a more detailed description of the role of the traditional authorities within the Suriname nation state.

7.2 Organizational capacity

Through social organization people can both build internal capacity and have a stronger representation in their dealings with outsiders, including the national government and Non Governmental Organizations. The Trio are members – by choice or by default – of a variety of national, regional, and local organizations.

7.2.1 National level indigenous interest groups

In 1992, at the conclusion of the interior war, two organizations were created to represent Suriname's Indigenous Peoples at the national level: The Organization of Indigenous Village Heads in Suriname (VIDS) and the Organization of Indigenous Peoples Suriname (OIS). In 2007 OIS members elected a new chair for their organization. Neither the election nor its outcome were accepted by the sitting chair, with the result that there are now two groups claiming to be the 'real' OIS.

In 2006, Trio and Wayana representatives established the joint Trio and Wayana Foundation TALAWA to represent the interests of Southern indigenous groups. The main reasons to start this group were, as dictated in a letter directed to the President of the Republic of Suriname requesting endorsement of the organization, that the Southern Indigenous Peoples "feel insufficiently represented by existing Indigenous organizations in Suriname" and "feel insufficiently involved in the execution of projects initiated by current Indigenous organizations in Suriname" (28 June 2006). For example, the Trio (and Wayana) are often excluded from activities organized by the existing national organizations due to the high costs of bringing them to the city.

TALAWA is an umbrella organization for Community Based Organizations that were created in nine Trio and Wayana villages to represent the interests of their inhabitants. To date, however, seven out of the nine existing CBOs are inactive and do not communicate much with TALAWA. TALAWA is now faced with the challenge to show the Trio and Wayana communities that it possesses the organizational strength, integrity, and capacity to initiate sustainable development projects in the Southern indigenous villages.

In 2007, the Platform National Consultation Body Tucajana Indigenous Peoples (Platform Landelijk Overlegorgaan Tucajana Inheemsen) was created by several former Tucajana Amazone fighters and the (ex)chair of OIS. At the inauguration meeting, it was announced that one Trio and one Wayana Kapitein were also part of the organizational board – without their knowledge, consultation, or consent. The Wayana representative was not present at this meeting and still does not know he is supposedly part of the board. After the inauguration meeting, the Trio and Wayana board members never heard again from this organization.

7.3.2 Community-Based Organizations

The Trio are poorly organized at the local level. The villages of Wanapan, Sandlanding, Amotopo, Kuruni, and Lucie have no active Community-Based Organizations. Also Stichting (Foundation) Wala (Litt: White heron) of Alalapadu has been inactive for some time. This Foundation is entrusted with the registration and marketing of Brazil nuts. A percentage is taken from every sack of nuts that is sent to town. This money is used as a social security fund to provide food and other necessities for the ill and needy in the village.

Stichting Meu (Transl: Cock of the rock) of Kwamalasamutu has existed for about fifteen years, and is doing several projects to support community development. Among its main tasks is care-taking of Werephai, a site with ancient indigenous petroglyphs. In collaboration with Conservation International, Stichting Meu is working on the construction of tourist lodges at *Iwana samu* (near Werephai) and the organization of tours to this archeological site. The money generated through tourism is in part used for community development. For example, Stichting Meu has helped the school by paying for replacement of the roof. Only a few individuals from Kwamalasamutu are members of this CBO though, and its communication with the community is limited.

Stichting Jaraware in Tëpu is the Trio working arm of the Dutch Foundation for Indigenous Peoples in Highland Suriname (*Stichting Inheemsen Boven-Suriname - SIB*). This NGO was created and still directed by a former teacher at Tëpu; Cees Koelewijn. The Jaraware Foundation manages a library and information centre at Tëpu, and is working on Trio-Dutch translations.

Community-based women's groups exist in Kwamalasamutu (Stg. Nana) and Sipaliwini (Stg. Vrouwenorganisatie Zuster Agnes). The seven members of the Sipaliwini women's groups have been sewing mosquito nettings with support of a Dutch donor organization. The women of Stg. Nana are currently executing a bread project with the help of a Peace Corps volunteer. In this stage the women are selling bread from an urban bakery in the village. They will use the money they earn too build an oven to start baking bread in the village. Stg. Nana also has been involved in the sale of traditional handicrafts made by its members.

7.3 Crime and Justice

7.3.1 Criminality and violence

The overall crime rate in the Trio area is low, particularly in the smaller, family-based settlements. Petty theft has become a nuisance in the larger village of Kwamalasamutu, but violent robberies and assaults have to date remained absent.

The use of soft drugs is on the rise in many Southern Trio and Wayana communities. In various villages people are producing marihuana, which is planted between cassava stalks

- which have similar-shaped leaves. A recent police investigation in Kwamalasamutu, following the suicide of a young man who was supposedly under the influence of marihuana, identified 30 men and women who are producing, selling and/or using marihuana. There also are strong indications that hard drugs, notably cocaine, are brought from Paramaribo to Kwamalasamutu. We did not find evidence for drugs consumption in the smaller Trio villages. The possession of both soft and hard drugs –either for sale or own consumption- is forbidden under Suriname law.

Domestic violence is not uncommon in the Trio communities. Beatings in the domestic sphere are typically the consequence of drunkenness due to the excessive consumption of *kasiri*, a popular lightly alcoholic cassava-based drink. They usually involve a man beating his wife, though the opposite sporadically occurs as well. Daughters also may be beaten by fathers for refusing to marry a preferred son-in-law, or for having a relationship with a rejected candidate. Even though many Trios may perceive intra-household violence as a private affair rather than a crime, the excessive corporal punishment of children and physical maltreatment of one's spouse are illegal under Suriname law.

Sex crimes occur regularly in the Trio area. Reported incidences include the sexual molest of young girls by adult men (including school teachers) in one of the communities. Rape of young girls also occurs with some regularity. Because domestic and sexual violence are not easily revealed to outsiders, it is not possible to provide hard figures on the number and nature of the above-mentioned incidences. Also prostitution, which occurs in at least one of the Trio villages, is not permitted under Suriname jurisdiction.

Infanticide used to be common among especially nomadic indigenous groups in the Amazon. Settlement and the arrival of the church have reduced the practice of both active and passive (letting the child die through neglect) infanticide. Nevertheless, unwanted babies continue to be killed incidentally. Our brief investigations suggest that this may occur less than once a year, but again, the hesitance of people to talk about these issues makes it impossible to get a grip on the true nature of this problem.

Public drunkenness (*openbare dronkenschap*), which is inextricably linked to kasiri parties, is technically 'unlawfull' behavior but locally not treated as such.

7.3.2 Law enforcement

Customary authorities have no mandate to speak law and justice. They may not impose laws other than national laws, and they are not legally allowed to arrest offenders or impose punishment. In practice, local authorities promote adherence to customary (as well as national) laws. They also may, as we explained above, resolve small offenses such as theft and village fights through punishment after consultations in village meetings.

Trio authorities depend on national law enforcement agents to deal with serious crime, but the nearest Suriname police posts are in Paramaribo (Central Suriname villages) and Apoera (West Suriname villages). The nearest military post is at Stoelmanseiland. For the militaries stationed here to reach Tëpu will take at least one full day of boat-travel, that is, if there is fuel, a boat, and a working outboard motor. Trio Granman Asongo has repetitively asked the national government for a police post and prison in Kwamalasamutu, though without result.

In the absence of national law enforcement agents, most criminal offences are dealt with at the village level by the national authorities. These processes usually involve some sort of arrangement between the family of the wrongdoer and the aggrieved party. If deemed appropriate, one of the Basjas will beat the perpetrator. Domestic violence and sex-crimes such as sexual molest and rape often go unpunished and are not treated as serious crimes. A lack of protection and a place to press charges against sexual atrocities leaves girls and women in an extremely vulnerable position.

7.3.3 Park guards

In 2006, the ACT helped the Trio of Kwamalasamutu to establish and train a team of park guards. Initial motivation for the establishment of this institution was the arrival of Brazilian gold miners named *garimpeiros* in the Sipaliwini area. Upon their discovery the Trio did not know how to handle and who to approach to remove these uninvited and wanted intruders. In the end, the *garimpeiros* left by themselves. The Trio had learned, however, that they had to establish an institution to defend themselves -with assistance from the government- against unwanted intruders

This event sparked the creation of a team of indigenous park guards in Kwamalasamutu. Their set-up follows the model used in Brazil, where indigenous rangers are patrolling the vast indigenous territories to prevent outsiders such as garimpeiros and loggers from entering these areas. ACT has funded the participation of two Suriname rangers in the park guard course in Brazil.

The indigenous guards will serve as the eyes and ears of the government in the Suriname-Brazil border-area. They will be patrolling the Trio area to identify threats to social and environmental stability before they become problems. Park guards will have no formal authority to arrest people, but rather work in close cooperation with national law enforcement agents. Discussions with the governmental office of Nature Conservation (*Natuurbeheer* – NB) about formalization of the indigenous park guards are ongoing.

At present the indigenous rangers from Kwamalasamutu are functioning as a local police force for the village. In July of 2007, one of its members intervened when a male villager tried to rape a young woman. They also are sending young girls that walk the streets at night home.

7.4 Socializing and leisure activities

7.4.1 Drinking kasiri

Kasiri is a traditional light alcoholic drink made of fermented bitter cassava (*Manihot esculenta*). The fermentation process involves prolonged cooking and exposure to fermentation agents to break down the starch to sugars (amylolysis), which subsequently are fermented to ethanol by ambient yeasts. Drinking kasiri is an important social activity and kasiri may be drunk and offered to guests throughout the day. Particularly in the smaller villages, we noted that many families had a large barrel of kasiri in the kitchen area, ready to offer guests a calabash or cup of the strong sourly smelling brew.

Figure 7.2 Woman brewing kasiri at Wanapan

Kasiri is more excessively consumed at fests. At these parties people will drink to the point of vomiting, and then drink again until ending into a stupor. Traditionally the ritual of drinking and vomiting is seen as a way to purify the body. The church has curbed excessive drinking to some extent but not been able to ban the habit entirely. The use of alcohol other than kasiri is limited, primarily due to the absence of other alcoholic drinks in most villages. Young men may be observed drunk on cheap city liquor but such occurrences remain incidences.

7.4.2 Parties

In the olden days, parties were held to celebrate the arrival of visitors are a good hunt. With christening and closer integration into the national society, Christmas, Emancipation Day/Keti-Koti[30] (July 1st), Independence day (November 25), International Indigenous Day (August 9) and (more recently) birthdays have become major party events. In addition to drinking kasiri, people at parties will chat with neighbors; eat a combination of traditional and urban snacks; and dance to music. Traditional music is rarely played at parties. Instead people prefer urban Suriname music, Brazilian rhythms, reggae tunes, and other non-indigenous songs that are roared from boom-boxes through the village.

In places with a school, children may celebrate national holidays in a non-traditional way. For example, at Christmas the children sing Dutch, Suriname, and American Christmas carols, listen to Bible stories, and have some extra snacks.

[30] KetiKoti literally means the chain if broken, referring to the abolition of slavery in Suriname on July 1st 1863.

7.4.2 Sports and leisure

Sports and leisure facilities for Trio youth and adults are virtually absent in most places. Soccer is the most popular sport and played in, and occasionally between, the main villages. The soccer field of Kwamalasamutu is used almost daily by young men. In Tëpu and Sipaliwini, soccer is regularly played at the airstrip. In several villages soccer has gotten a boost after the July 2007 inter-village soccer competition between the villages of Kwamalasamutu, Palumeu, and Tëpu. The 'Suriprofs', a group of professional soccer players of Suriname origin, had sponsored complete outfits for the three teams. The event was the talk of the town for weeks and inspired many young boys to kick the ball around.

In Kwamalasamutu, girls and young women used to play baseball at the soccer field on Wednesdays, when the men are supposed to go hunting. As they were chased away every time a couple of men wanted to use the field for soccer, they stopped using this field. For a while girls were playing baseball at the airstrip on the edge of the village but this initiative faded because parents could not keep a vigilant eye on their girls when they are at the airstrip.

In Sandanding, Wanapan, Amotopo, Lucie, and Alalapadu we did not observe any sport activities.

7.5 Safety nets

7.5.1 Formal safety nets

The Suriname government does not have a long-term policy strategy to cushion either household shocks or community- and region-wide disasters in the interior. Public safety nets are limited to minimal social welfare payments and sporadic responses to current events.

The most valuable form of insurance the Suriname government provides for its interior inhabitants is free access to health care in MZ clinics and, if necessary, one of the hospitals in Paramaribo. The government also expends social security payments including old-age pensions (AOV), child benefits, welfare, and allocations to particularly needy groups, such as handicapped people. These social benefits, however, are too low to provide the safety nets they are supposed to present. There are no emergency funds to help households confronted with temporary shocks such as insect plagues or harvest failure overcome difficult periods.

In April-May 2006, large parts of the Suriname interior, including some of the Trio villages, were flooded due to extreme rainfall and subsequent high water levels in the rivers. Cassava and other food crops rotted in the oversaturated soils, and people harvested the roots before they were full-grown. A food shortage was the result. The government and various NGOs were rapid in providing disaster relief to all interior villages to help them cope with the impacts of the flooding.

While assistance did help many families overcome immediate food shortages, most relief efforts lacked a long-term vision. The grand share of aid money has been spent on food and bottled water droppings, and virtually none on increasing people's resilience to future shocks. Also, as the President declared the entire interior a disaster region (*rampgebied*), foreign tour operators cancelled their trips to the interior – thus hurting the communities' capacity to earn money for reconstruction of destroyed properties.

A year later, in May/June 2007, the interior was once more confronted with rather high water levels and the flooding of agricultural field – though not as dramatic as in 2006. The people of Kwamalasamutu and Sipaliwini experienced another shortage of cassava and once again the Trio asked for emergency relief assistance. When the government did not respond, Granman Asongo traveled to the city to demand food aid for the people of Kwamalasamutu. In June/July 2007 the government sent several planes loaded with kwak – dried cassava crumbs- to Kwamalasamutu.

7.5.2 Informal safety nets

Reciprocity may be considered one of the cornerstones of the traditional Trio society. Hunters and fishers typically share the meat and fish they obtain with their extended family and other villagers. When women brew a large barrel of kasiri, large calabash-bowls of the alcoholic cassava drink are offered too formal and informal visitors. Traditionally, needy and underprivileged families and individuals, such as elderly or disabled people, are fed and otherwise taken care of by their neighbors and other community members. Village fests also traditionally are events where wealthier people, better hunters, and more successful farmers share some of their riches with less privileged groups in society. Such gifts are reciprocated by either material goods or immaterial services such as the care for children or loyalty during disputes.

Reciprocity continues to be the way-of-life in the smaller, family-based villages. In the larger communities, however, this system is crumbling off and making place for a greater degree of individualism. In Kwamalasamutu, for example, surplus fish, bush meat and kasiri are now being sold for cash money at the bi-weekly markets rather than given away. We also have noted the presence of several very poor families that do not obtain much support from their surroundings. These trends may partly be a result of community-size; it is simply not possible to share one peccary (bush-pig) with more than 800 people. More important, however, seems the tighter integration into the money economy, and the villagers' desire to earn cash money to buy consumer items. Today, people ask money even for the smallest services that used to be performed for free.

Figure 7.3 Woman is roasting bush meat, which is to be distributed during a village fest.

We give an example. ACT is constructing a village-wide water system in Kwamalasamutu. The organization asked physically strong men from the community to contribute labor to complete this system for the common good. After all, access to clean water will reduce illness incidences among everyone's children, and placing village taps will reduce women's efforts to obtain water for household use. It took a lot of effort, and ultimately involvement of the Granman, to get the village men to dig a few trenches without cash payment. In the village of Alalapadu, by contrast, villagers gathered on their own account to construct a house for ACT personnel without asking a penny.

After its establishment in the 1960's, the Baptist church used to have a strong social function in taking care of the needy. This institution would mobilize villagers to collect fire wood and/or food for the elderly, ill people, and other community members in need of support. Such charity work has withered in recent years. In Kwamalasamutu, only a few elderly church ladies are still visiting families to lend a helping hand. Church-visitors have talked about the necessity to the revitalize this traditional form of home care, but so far no-one has taken the lead.

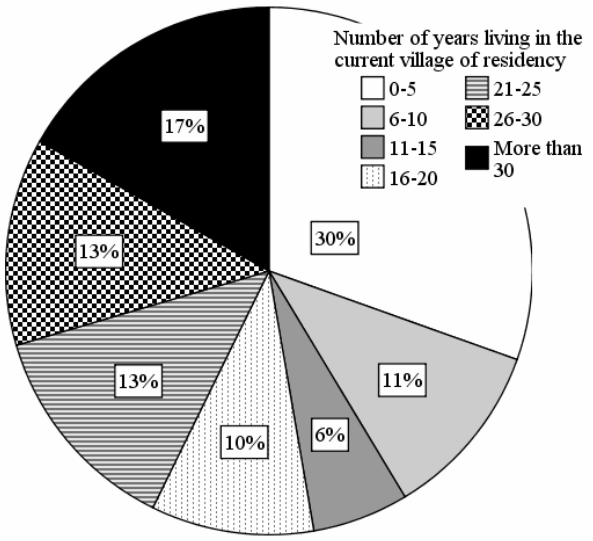
In the absence of public institutions that provide adequate social insurance, community leaders in several places have organized or are planning a community-based social support system. During the food shortages of April-May 2007, for example, the Trio Granman sent various families from Kwamalasamutu to smaller communities to produce food for their hungry relatives. A weak point in this strategy was transportation of the food to Kwamalasamutu, for which the Trio had to rely on NGOs. As another example, the Hoofdkapitein of Tëpu is planning to establish a village emergency fund, by collecting a small fee from every souvenir that will be sold from the new Cultural Center. This fund should help take care of particularly needy community members, and support ill people that need to travel to Paramaribo for treatment. In these cases, plane transportation and hospitalization are paid for by MZ, but additional costs in the city fall on the patient.

7.6 Migration

Prior to the arrival of missionaries, the Trio were (semi)nomadic, moving every couple of years to new lands to plant and hunt. That the Trio were more dispersed not too long ago is apparent from a listing of their birth villages. About a quarter of Suriname Trios heads of household (M/F) were born in Kwamalasamutu (26.7 %), and another quarter in Brazil (26.2 %) – either in Missão Tiryo or in one of the smaller settlements. Other significant groups of household heads had been born in Alalapadu (17.1 %) and Tëpu (14.6 %) since the times that the Baptists had made these villages to centers of missionary activities. The remaining 15.4 percent of household heads, mostly older adults, had been born in another 18 villages and settlements. These places included now abandoned settlements along the Tapanahoni, Sipaliwini, and Kuruni Rivers, and the Wijumi, Kanmani, and Akarupi Creeks. A few individuals were born in Guyana (2.5 %) and French Guyana (0.6 %).

Today, at least 17.9 percent of Trio heads of household are living in their birth community. This is particularly the case for the people of Kwamalasamutu and Tëpu, which have been populated by the Trio for several decades. In addition, some people who had been born in Alalapadu have now returned.

Figure 7.4 Number of years the heads of household (M/F) have been living in their current village of residency.



Despite their clustering in several larger population centers, we find that Trio families continue to be quite mobile. More than half of household heads either did not know their age (20.5 %) or could not remember how long they had been living in the place where they were living at the time of the research (38 %). Among those who did know, we find that almost a third (30.5 %) has only recently moved to their current community of residency. This includes most of the families in the recently (re-)build communities of Wanapan, Alalapadu, Kuruni, Amotopo, and Lucie. On the other hand, 16.8 percent of household heads had been living in his or her current place of residency for more than 30 years.

More than half of heads of household (52.7 %) reported living for more than 15 years in the community where they were living at the time of the research. Our data suggest that while Trio families continue to move around to either temporarily or permanently live in another community, they live both more concentrated and more sedentary than in their tracking days before the 1960s.

CHAPTER 8
FINANCIAL CAPITAL

The following pages analyze financial resources in the Trio area. We begin this chapter with a description of community level economic structures. Next, in section 7.2, we describe economic activities. In chapter 5 we already discussed the various subsistence activities that Trios perform to obtain food and assets. In this chapter we will focus on cash generating activities.

Differences in access to financial resources between the various villages become apparent in subsequent sections on markets (7.3), social security (7.4), and asset ownership (7.5.1). The impression that the population from the larger villages is relatively wealthier is reinforced by a rudimentary analysis of cash flows – proxied by shopping money. The chapter concludes with a description of donor assistance in the Trio community.

8.1 Financial infrastructure

Physical financial infrastructure in the form of banks, tellers, exchange offices, and gold buying centers, all of which are common in the coastal area, are absent in the Trio area. Also private enterprises such as stores and restaurants are rare. Due to the limited presence of government and large industry, which employ the largest share of coastal Surinamers, few Trio's have wage labor jobs. The few small businesses and NGOs working in the area can only employ a handful of Trio and government functions are sparse. Because of the low number of people that earn regular wages and the absence of banks in the near surroundings, very few Trio's have a bank account. Among those few who do have a checking account are public officials.

One consequence of the above is that the grand majority of Trio's cannot obtain credit, for example to start up a small business. This condition is reinforced by the absence of personal land titles, which means that people cannot use their land as collateral for a bank loan. We did not hear about activities of private money lenders in the Trio living territories.

As travel to the city is very expensive, it only makes sense to go if one needs to buy large amounts. A family running out of sugar, salt, or fuel will try to buy these items from others in the village. In most villages there is at least one person selling food and commodities from Paramaribo; though a store, an open market place, or the home. Traditional authorities often are involved in the resale business because they have relatively more opportunities to travel to town, for example when they are invited by an organization or the government.

In the main village of Kwamalasamutu there are five stores, the largest one of which is owned by a Dutchman. In addition, one of the villagers operates a stand on the central

village square to sell popcorn, other snacks, and small consumer items. The women's group Stg. Nana sells bread that is obtained from town. The one store in the village of Palumeu is owned by the village Kapiteins. Also the Kapiteins of Sipaliwini and Alalapadu sell products to community members and outsiders. There do not seem to be stores in Amotopo, Kuruni, Wanapan, and Sandlanding. Sandlanding's location on walking distance from Apoera, where there are several supermarkets, reduces the needs for a store. In all villages, people who travel to town may buy extras for resale in the village, hence financing part of their own trip.

8.2 Income generating activities

During the study we were surprised by the great degree of the economic specialization among the Trio villages. The various communities appear to have only one or two dominant sources of income - with the exception of the largest place Kwamalasamutu, where people perform a wide variety of jobs

- Sandlanding and Wanapan

The main source of income for Sandlanding and Wanapan is the sale of fish and bush meat in either Apoera or Nickerie. Since the people in these two small villages are part of one larger extended family, people frequently travel back and forth between the communities. Hunters and fishers from Wanapan may spend some time with their relatives in Sandlanding to be closer to the market. Vice versa, men from Sandlanding may return to Wanapan for some time to hunt and fish. In addition, some of the Sandlanding men have worked in Apoera, among others with the gravel mining company West Suriname Mining and with logging companies active in the area.

Figure 8.1 Production of indigenous jewelry in Sandlanding

Girls from Sandlanding with a basket full of collected mara-mara seeds

Young woman from Sandlanding making a necklace of seeds

Among the adult women that reported an income, most are selling indigenous jewelry. They usually make necklaces and bracelets from *mara-mara* (*Didimopanax morototoni*) and other seeds – though they also may use tiny beads (Figure 8.1). In addition, two persons receive a stipend as traditional authorities and one person earns income from occasional tourists.

- Amotopo and Lucie

Four out of seven adult men from Amotopo are selling birds, frogs, and snakes (See Ch. 5). They are mostly after singing birds; the large-billed seed-finch (*Oryzoborus crassirostris*, local: TwaTwa) and the lesser seed-finch (*Orizoborus angolensis*, local: Pikolet), which catch attractive prices at the Paramaribo market. Their main problem is getting the birds to the city. The locally active tour operator - the only one frequently flying to Amotopo - and many others landing at the Amatopo airstrip (e.g. ACT) prohibit transportation of the animals. Three adult men from this community are selling fish and bush meat. Also for them transportation to the market is a main hurdle as their products rapidly spoil outside of a freezer.

Women from both communities try selling crafts to the tourists that frequent a nearby tourist lodge owned by the Tropical Gem Tours. The Kapitein from Lucie complained that local crafts producers have few opportunities to sell their products because the tourists are bought straight to and from the lodge without stopping in the communities

Several Trio individuals and families from Amotopo and Lucie are temporarily living and working in the Lawa general area. At the time of the field visit to Lucie, only the Kapitein and his wife were left in this tiny settlement. Some Trios are working for Wayanas in French Guiana, who are much wealthier due to French government support. They cut their fields, clean gardens, and perform other physical labor. At least five adult men are working in gold mining. Some of them sell fish and bush meat to the miners, while others participate in the mining production process by working in the pit. Two men and a woman are traditional authorities.

- Kuruni

The village of Kuruni is primarily supported by the Suriname government. Half of the adult man from this village (N=5) are working for the Service for Aviation Grounds (Luchtvaartterreinen– LVT). In addition, the Kapitein receives a public stipend for being a traditional leader.

The men that earn money outside of government rely on animals to make a living. Three men are catching and selling birds; two trade frogs and snakes; and two sale fish and bush meat. Some men perform two of these jobs, or combine them with government employment. For women, the main income generating activity is the sale of crafts (indigenous jewelry).

- Alalapadu

The main source of income for Alalapadu is the sale of Brazil nuts. 91 Percent of all adult (> age 15) men and women in the community earns income from Brazil nuts collection and subsequent sale. This process involves collecting the nuts from stands of Brazil nut trees (*Bertholletia excelsa*) in nearby forests; breaking the hard outer shell with a machete to obtain the individual nuts in their own shell; drying the nuts; packing and weighting the nuts; and registration prior to sending them off to markets in Paramaribo. At present the nuts are not yet being cracked and/or processed by the villagers for added value.

Only two women in Alalapadu reported making handicrafts for sale, which is the main income generating activity for women in many of the other villages. In addition, a handful of Trios from this community earn an income though the sale of birds and as traditional authorities.

- Sipaliwini

.

In Sipaliwini, where the popular *Picolet* is relatively abundant in the nearby Savanna, the sale of singing birds is the main source of income for more than half of all adult men (53.6 %). In addition to singing birds, Sipaliwini bird hunters catch and sell ornamental birds such as the parakeet and different types of parrots (see Ch. 5), as well as owls, hawks, and any other bird that might fetch a few pennies on the local market.

Figure 8.2 Animal trade is the main source of income for Sipaliwini households

Twenty-five percent of men (also) sell reptiles and amphibians. They specifically search for the green tree boa, other snakes, and the brightly colored tree frogs (see Ch 5). Just over 10 percent of interviewed adult men sell turtles and fewer men (± 7 %) sell fish and/or bush meat.

Two-thirds of adult women from Sipaliwini are making traditional crafts. Apart from a small number of tourists, there is no local market for these products. Some women try to sell in Paramaribo at places where tourists hang out.

One villager (M) obtains income from tourism as a guide for the Paramaribo tour operator, *Bodeco adventures*. This agency offers tours to the Vier Gebroeders Mountains, the Sipaliwini Savanna, and Kwamalasamutu, which include a stay in Sipaliwini village. The village Kapitein probably receives payment for the nights that the tourists stay in his village.

The MZ employs one woman and the Service for Aviation Grounds (LVT) two men. At least one man works for the church, one woman teaches the school children, and a couple of others earn income by weeding and cleaning the village and its surroundings. These people are paid by the Kapitein.

- Kwamalasamutu

The inhabitants of Kwamalasamutu perform a wide variety of jobs. This diversification is a result of Kwamalasamutu's size; its status as the Trio capital; improved access to transportation to and from Paramaribo due to a regular weekly flight; the greater availability of public infrastructure; and the presence of various NGOs (e.g. ACT, CI) that conduct projects in and around the village. In other words, Kwamalasamutu is more closely integrated in the national money economy, which in turn provides novel options for money-making..

Figure 8.3 Income generating activities performed by adults in the sampled households (N=167) in Kwamalasamutu

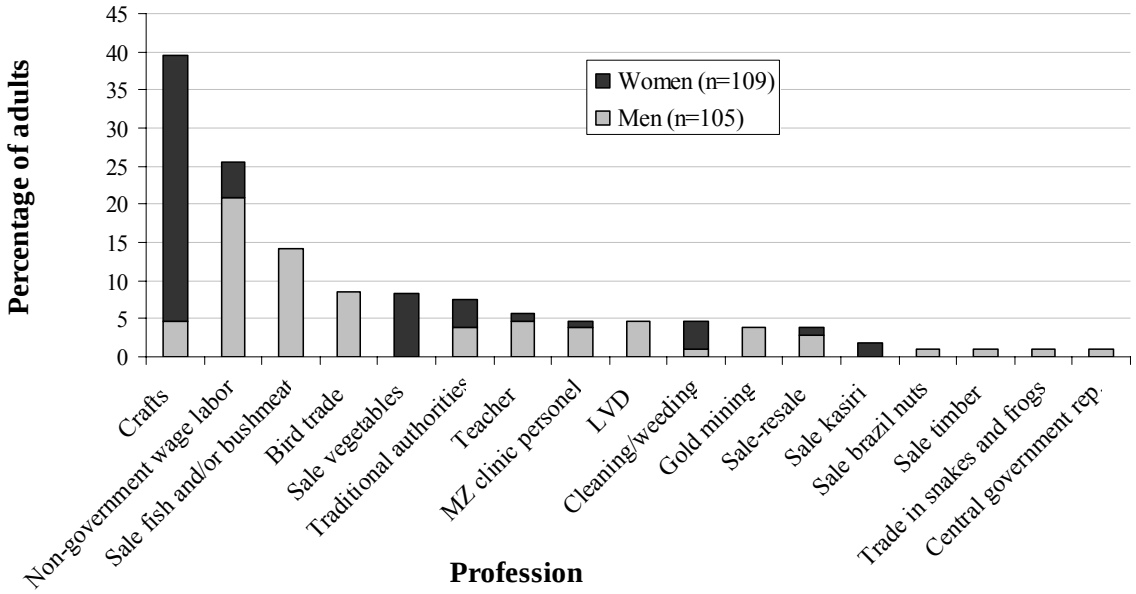


Figure 8.3 shows the income generating activities reported by adult men and women in the sampled households, excluding the people who said they did not earn any income. Because people tend to underreport their sources of income, the absolute values of the bars are less relevant than the overall pattern shown by the graph.

Our data indicate that the most important economic activity for women is the production of traditional jewelry. In addition, one out of every ten women (10.1 %) earns some money from her agricultural work, through the sale of vegetables or *kasiri*. Another relevant source of employment for women is wage labor, either for the government or for NGOs. The government employs several women as Basjas (traditional authority) and school teachers. A few women are involved in maintenance activities involving the

cleaning of buildings and/or weeding of land, again either for the government or others. One woman reported buying and reselling urban products from her home. Almost a third of women (31.2 %) reported not earning any cash money.

The main source of income for men in Kwamalasamutu is non-public wage-labor. These wage labor jobs are typically offered by Non-governmental organizations (NGOs) such as ACT, Conservation International (CI), and MZ (represented by a separate bar). The main employer is ACT. ACT's core personnel consist of six shamans and five apprentices who work in the traditional health clinic Katamïïme. Furthermore, six men and one woman are working as indigenous park guards. In addition to these more permanent jobs, several Trios find temporary employment with one of ACT's projects. For example, several men have temporarily been gathering geographic data for a Trio map, a project that finished in August 2007. Other men are now working on the construction of a village-wide water system (July-August 2007).

Second in line among the most important sources of income for men is the exploitation of natural resources. In this broad category, the most relevant activity is the sale of fish and bush meat at the local market, which is followed by the catch and sale of birds –primarily singing birds. In addition, one man reported catching snakes and frogs. Apart from catching animals, men are working in gold mining –usually in the Lawa area- (3.8 %) and lumbering (1 %).

The third main source of income for men from Kwamalasamutu is the government. Public jobs include those of the traditional authorities (Granman, Kapiteins, and Basjas), teachers, LVT personnel, and a Governmental Inspector (*Bestuursopzichter*- BO). Just under three percent of men buy and resell city products from stores or markets in the village, and one man reported selling Brazil nuts

Among the less prominent sources of income is the production and sale of marihuana. We also have indications that hard drugs are flew in from the city and being sold in the Kwamalasamutu. Due to the clandestine nature of this activity it is not possible to estimate how men and women are involved.

- Tëpu

Tëpu is nationally known as a center for animal trade. In this context we doubt the accuracy of our finding that only 7.9 percent of men sell snakes and frogs, and that only half of the men in this group also deals in birds. It also is difficult to believe that one third of all adult men, and even more than half of young (<30) men –who tend to have the highest financial needs- are not earning any income. We suspect that the low numbers of men active in the animal trade are a result of respondents giving desirable answers and misrepresent reality.

Like in Kwamalasamutu, the government and NGOs are main employers. About one tenth (9.5 %) of men and 2.8 percent of women is working as a Kapitein (only men) or Basja, four men from the sampled households (6.3 %) work for the LVT, and five people

(4 men, one women) in this group are teaching at the local elementary school. The main provides of non-government wage labor are ACT, Stg. Jaraware, and the MZ, who together employ 10.4 percent of adults.

Furthermore, 5.6 percent of women earns some money making traditional crafts, two men are electricians, and two men and a woman are cleaning and weeding for others.

8.3 Wages and incomes

How much can people earn with the above-mentioned jobs? This question is difficult to answer given the irregular, transient nature of most jobs performed by the Trio. The only stable wages are those paid by the government and NGOs.

Traditional authorities who are recognized by the government do receive an honorarium, which amounts to USD 67 (185 SRD)/month for Basjas; USD 118 (325 SRD)/month for Kapiteins; and USD 182 (500 SRD)/month for head-Kapiteins. For recipients under the age of 60, taxes and old-age pension payments totaling USD 7.27 (20 SRD) are deducted.

Trios working regular jobs at the ACT clinics earn, depending on their position and responsibilities, between USD 50 and USD 100 a month. The members of the GPS-team, which are hired temporarily for a very intense working period earn about USD 100 per three weeks.

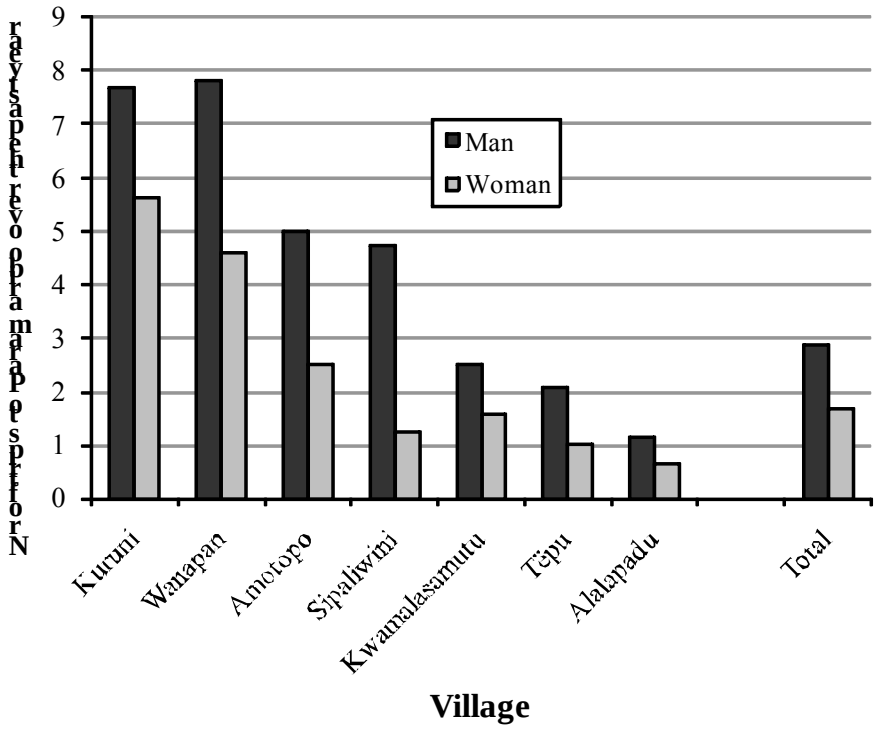
8.4 Expenditures

Most inhabitants of the interior, including the Trio, have come to rely to a greater or lesser extent on manufactured goods and services. Most Trio families regularly eat rice, sugar, salt, bouillon cubes, and other processed foods. They also rely on shotguns, tools, plastic ware, and other Western assets. For all these products, the Trio have to either travel to the coastal area or rely on others traveling to town.

We tried to obtain some understanding of peoples' purchasing power, and the variation in this variable between the different villages, by looking at their travels to the capital city. The reason to do so is that people have a poor recollection of the items they have bought, particularly over a longer period of time (e.g. 1 year), and how much they paid for them. Trips to the city are likely to be remembered because many people only have the resources to fly to Paramaribo once or twice a year. At these rare occasions, all necessities for the subsequent months are bought. The amount of money people take with them on these trips is therefore a reasonable indicator for their cash flow.

Figure 8.4 shows the average number of times that men and women from the various villages said they had traveled to town during the past year. We excluded the village of Sandlanding because the inhabitants of this community live close to the urban center of Apoera that they do not need to travel to Paramaribo to buy their necessities.

Figure 8.4 Average number of times in the past year that the male and female heads of household traveled to the city



We had expected to find that the people from Kwamalasamutu, the only village with a regular flight service, would travel most frequently to town. This is not the case at all. The people from Kuruni are the most ardent travelers. On average, men from this village visit the capital city 7.7 times a year, while women, on average, travel 5.6 times. A possible explanation for this observation is that half of Kuruni's men works at the Service for Aviation Grounds (LVT). Their salaries are transferred to a bank account in town, and their transportation is free.

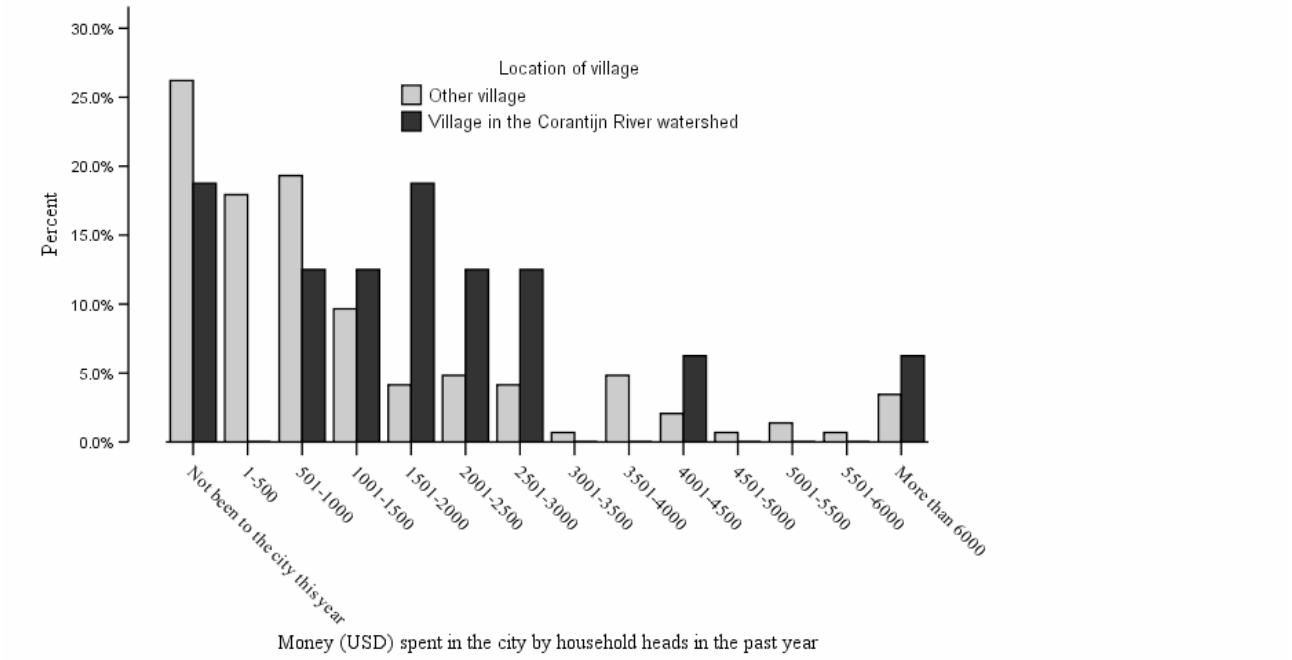
The next most frequent travelers are the people from Wanapan, who go regularly by boat to the coast to sell fish and bush-meat in Apoera and Nickerie. Their transportation expenses are relatively lower than those of air transportation because people are able to share one boat with many. Over the past year Basja Jang from Wanapan has on various occasions come to town on the invitation of ACT, CI, and the NV Billiton Maatschappij Suriname (BMS). His trips, which were sponsored by the named organizations, provided a free ride to town to the other villagers as well.

Also Amotopo residents come to town regularly; on average five times a year for men and 2.5 times for women. They make use of the flights from tour operator Tropical Gem Tours, who make use of the airstrip near the village to bring tourists and their supplies to their lodge. If there is room on these flights, for example when tourists have been flown in, the villagers can –after consultation with the tour operator- hop on the flight free of charge. Only if they carry an excessive amount of luggage, a return favor (e.g. mowing

the airstrip) may be asked. We do not know for sure what enables Sipaliwini residents to travel frequently, but we suspect that the charter flights of animal traders offer travel opportunities. In all villages, women travel less than men. Because, as explained above, most Trios wait for a free ride to town before they come, the number of trips to town *an sich* say little about people's expenditure patterns.

We asked the heads of household how much money they took with them on each of these trips to town. Even assuming that people answered the question honestly, we realize that the values we obtained are at best rough approximations of the household's disposable income. Looking at the self-reported amount of money people have taken to town to buy household needs over the past year, we did not observe –as we had expected- that Kwamalasamutu households have more to spend than households in the other villages.

Figure 8.5 Amount of money (in USD) taken to the capital city of Paramaribo to buy household needs by both heads of household in the past year



The data do suggest that there is a positive correlation between the amount of money people have to spend and the number of times they go to town. Families from the Corantijn River watershed (Sandlanding, Wanapan, Amotopo, and Kuruni), who traveled most frequently to Paramaribo, also spent relatively more money. Their average sum of money taken to the city is higher and they are better represented in the high expenditure categories (Figure 8.5). Due to the large variation within the villages, however, the difference in mean household expenditures between these and other households is not statistically significant.

One curious observation concerns bi-polarity in spending patterns in Sipaliwini. In this community, the heads of 50 percent of all households have not been to town at all, a third of households spent between USD 1 and 1000 on their trips to town, and the remaining

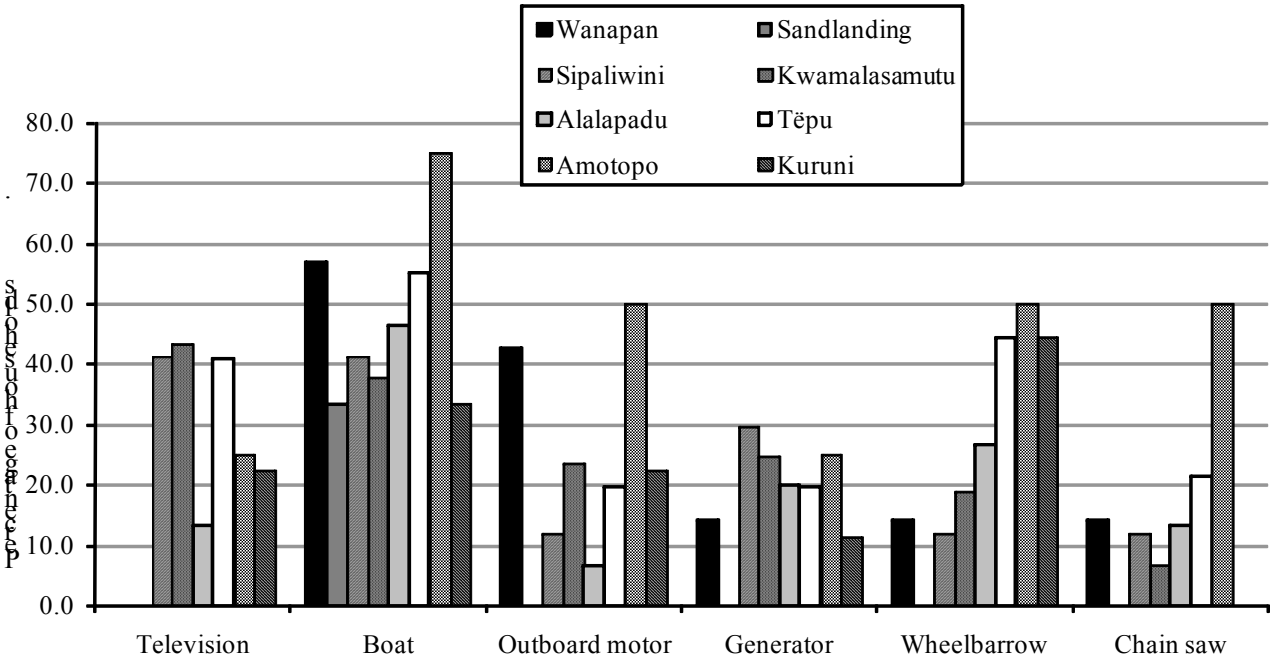
16.7 percent of households spent more than USD 6000 in Paramaribo during the past year. We cannot explain this huge gap between Sipaliwini's poorer classes and the wealthier inhabitants.

Young couples (households with a male head of household younger than 30) do not have a significantly more or less money to spend than older couples.

8.5 Wealth

Because it is difficult to obtain accurate measures of incomes and expenditures through one-time surveys, we used the possession of selected consumer items as a simple wealth indicator. The underlying assumption is that as people get wealthier they will buy more of certain preferred goods.

Figure 8.6 Share of Trio households owning at least one of the following consumer goods

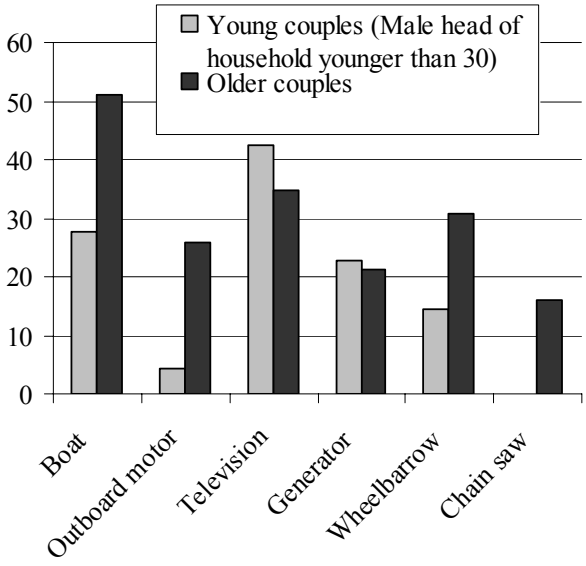


We identified five consumer items as relevant indicators of relative wealth: generator, television, wheelbarrow, outboard motor, and chain saw. These assets are among the most popular items to buy when Trio households have saved some money. In terms of the distribution of these items over the different Trio villages, we do not find a very strong pattern of differences between the villages. For example, households in Sipaliwini are relatively likely to own a television (41.2 %) and generator (29.4 %) but are below average in ownership of an outboard motor (11.8 %) or wheelbarrow (11.8 %). Households in the communities of Alalapadu and Kuruni compare poorly to the others in terms of ownership of TVs and outboard motors, but the number of households that own a generator or wheelbarrow is about average.

The village-differentiated analysis of assets ownership suggests that the households of Tëpu and Sipaliwini, which are actively involved in the animal trade, are relatively well-off. Relatively poorest seem the families from Sandlanding, who do not possess any of the listed assets other than a boat (33 % of households), and Wanapan, where very few people own expensive assets – with the exception of outboard motors. These two villages are closely linked through family ties and regular exchanges.

We believe that our data give a good indication of relative wealth in the different villages, but do not allow for drawing strong conclusions. In the first place, the five selected indicators may not have the same relevance in all villages. For example, for Kwamalasamutu residents, who tend to travel to Paramaribo by plane, ownership of an outboard motor is less important than for the people from Wanapan, who can only rely on their boats to get to town. Secondly, size differences between the villages affect the size of the asset categories. Hence it is not possible for 10 percent of Amotopo's households to possess a generator because the sample consists of only four households; if one out of these four owns a generator, 25 percent of households possess this asset.

Figure 8.7 Asset ownership among young (n=48) and older (n=156) couples



One could expect that younger couples are more likely to possess expensive consumer goods because they tend to be more sensitive to fashion trends, but this is not the case. On average, young couples are slightly more likely to own 'hip' electronics such as a TV and/or a generator but this difference is not statistically significant. When we look at the possession of functional assets that since the 1960s have been of high value to the Trio, older couples are more likely owners. As compared to couples where the male head of household is younger than 30, older couples are significantly more likely to own a boat, outboard motor, wheelbarrow, and/or chain saw[31]

[31] Significance values for the t-test of asset ownership between younger and older couples are for possession of a boat $p<0.005$; outboard motor $p<0.005$, wheelbarrow $p<0.05$, and chain saw $p<0.001$)

8.6 Private business development in the Trio area

8.6.1 Tourism

Sipaliwini and Kwamalasamutu

Due to the high costs of transportation, few tour operators exploit the Trio area. Among those that do have Trio villages in their package is Bodeco Adventures, which for € 750 brings tourists to the villages of Sipaliwini and Kwamalasamutu, the Vier Gebroeders mountains, and the ancient petroglyphs of Werephai. Apart from one or two Trio guides, the authority providing lodging in the villages (3-4 nights), and Stichting MEU, which manages Werephai, few Trio individuals earn income from this tour.

Conservation International is working with Stichting MEU to develop luxury tourist lodges a couple of km from Kwamalasamutu at Iwana Samu (meaning Iguana Beach), near the boat landing for Werephai. As far as we know the lodges are not yet completed and tourism has not yet commenced. Sometimes tourists come on their own account to visit Werephai, usually facilitated by organizations working in the area. These and other visitors to Werephai have to pay an entrance fee to see the place (US$150 per group), either in Paramaribo or in the village.

Wanapan

Different tour operators wanted to build a tourist lodge near the village of Wanapan and the impressive Wonotopo falls. The Basja of Wanapan, however, has blocked these efforts because he has built his own tourist camp on a small island across the village for people to stay.

Arapahu island

Tour operator Tropical Gem Tours organizes high quality eco-tourism at Arapahu island, about 13 km south of the village of Amotopo. The tourists come for nature walks, wildlife spotting, bird watching[32], and fishing (only catch and release). Tropical Gem Tours obtained a land lease title (grondhuur) for the island and the land between the Amotopo airstrip and the boat landing about 11 years ago – well before the Trio settled in this area. In 2003 a group of Trios from Kwamalasamutu began building homes at Amotopo. The Trio traditional authorities conveyed they had not come to stay but were on their way to settle at Lucie further downstream – as part of Granman Asongo's dispersal strategy (see Chapter 3). Today all signs suggest that the population of Amotopo has come to stay.

Staff working at the Tropical Gem Tours lodge consists of both Indigenous peoples from Kwamalasamutu and outsiders, who work in 6 to 8 month shifts. The villagers from Amotopo and Lucie earn from the tourists by selling souvenirs (e.g. indigenous jewelry, handicrafts) at the airstrip.

[32] Ornithological studies have recorded 260 species of birds and the area recently received the forma status of Important Bird Area (IBA) from UNESCO.

Palumeu

Several Trio individuals earn an income from tourism in the village of Palumeu, which is formally located on Wayana lands. National tour operator METS organizes tours to Palumeu and employs 27 villagers as boatmen, kula-men (the person in the front of the boat with a long stick to push off), maintenance personnel, housekeepers, and bar and kitchen personnel. Thirteen of them are employed on a contractual basis and the remaining 14 are hired on a daily basis when they are needed. Salaries start at USD 3.64/day, and may rise to 5-7 USD/day as workers get more experienced.

8.5.2 Mining

Gold mining

Small-scale gold miners, who are active throughout Eastern Suriname, have not yet started exploitation and exploration activities in the Trio area. The main reasons for their lack of interest in this region include the difficult (and hence expensive) access and objections of local authorities against gold mining. In 2006, a small group of Brazilian miners (named *garimpeiros*) were spotted near the village of Sipaliwini. The Granman's request for assistance from the Ministry of Regional Development to remove these people remained without response. Next the national police in Paramaribo was called upon for help. In the end police intervention was not needed though, because the garimpeiros left when they heard about possible a police mission to the area.

According to a 2005 map of mining concessions granted by the Geology and Mining Department (GMD) several large-scale gold mining concessions have been granted within the Trio customary areas[33]. Two concessions overlap with and extend along the Lucie River (near the source), the Kabalebo River (near the mouth). Another concession is supposedly granted just east of the village of Wanapan. We do not know whether these concessions have been recently withdrawn. To date no mining activities have been performed at the named locations.

Bauxite mining

The main anticipated multinational mining operation of interest to the Trio at the moment is the development of a bauxite mine and possible auxiliary activities in the Bakhuys Mountains of West Suriname. The Bakhuys project is jointly owned and operated by NV BHP Billiton Maatschappij Suriname (BMS) (45 %) and Suralco (55 %)[34]. In the case of a joint venture, BMS would be responsible for mine exploitation and Suralco for refining of the raw product.

In January 2003, the Government of Suriname and the mining companies signed a Memory Of Understanding (MOU) for exploration of the 2,800 km^2 (278,000 ha)

[33] NARENA 2005
[34] Weitzner 2007

concession area. BMS recently completed its exploration program, which had started in November of 2003. Sufficient available bauxite has been indicated and negotiations with the government about exploration are currently underway. Pending government approval, construction activities may start in 2008, and the mine could be operational in 2010/11.

Figure 8.8 Bakhuys concession area

Source: BHP Billiton Maatschappij 2007

It remains uncertain whether Suralco will build a refinery in West Suriname or if the raw material will be transported to the existing refinery at Paranam (Central Suriname). If the Paranam plant is used, which currently appears most likely, a beneficiation plant is required to upgrade the lower-quality ore from the Bakhuys area. It also is uncertain where, if needed, this beneficiation plant would be built. Suralco also has not yet made a definite decision about the construction of a aluminum smelter in West Suriname Alternatively the bauxite would be transported to Trinidad, as it is now.

The energy to operate a smelter would most likely be provided by a hydropower plant south of the concession area. In that case, Suralco would be responsible for construction and management of the plant. Plans to gain hydro-energy by damming the Kabalebo watershed are not new. The Government of Suriname first proposed such a project in the 1960s but never went beyond the panning phase. In the 2005-2009 multi-year plan, the Government of Suriname reiterated the importance of a hydropower plant in West Suriname to meet Paramaribo's increasing demand for energy. Suralco, however, does not seem eager to develop this project and has called its execution unlikely.

The possible impacts of mining, ore transportation and processing, and hydropower development on the Trio communities and their surroundings will be discussed in detail in the Environmental and Social Impact Assessments (ESIA) performed by SRK consulting on behalf of BMS, as well as by the various impact studies performed by independent parties[35].

[35] See for example Goodland 2006, Weitzner 2007, VIDS 2007

8.7 Donor assistance

Many national and international organizations are developing projects in the interior. The main governmental entity is the *Fonds Ontwikkeling Binnenland* (FOB, Fund Development of the Interior), which operates under the Ministry of Regional Development. Relevant national organizations include the Community Development Fund Suriname (CDFS), the umbrella organization Forum NGOs, the National Women's Movement (Nationale Vrouwenbeweging, NVB), and the Zuster Agnes Foundation. International donor organizations that have executed projects in the Suriname Trio community in 2006-7 include Amazon Conservation Team, Conservation International, PAHO/WHO, Global Fund, and the Foundation for Indigenous Peoples in Highland Suriname (*Stichting Inheemsen Boven-Suriname*).

We will not provide an exhaustive list of all projects executed by these and other organizations in the Trio area over the past year. What we present below is a selection of projects that demonstrate the diversity in assistance schemas in fur target areas: health, education, income generation, and biodiversity conservation.

8.7.1 Health-related projects

In order to reduce water-born diseases, WHO/PAHO has supplied rainwater catchment bins, the so-called durotanks, in most villages to reduce reliance on the river. Other organizations, including ACT, have helped to bring these bins to the interior villages. The villagers themselves need to place the bins to catch rainwater and are responsible for cleaning and maintenance. ACT is currently constructing a water system in the village of Kwamalasamutu.

In 2006 the Global Fund in collaboration with MZ launched an anti-malaria project in the interior (Global Fund Project SUR-404-G02-M). As part of this campaign, the MZ has been treating patients with a new medicine "Coartem", distributed impregnated mosquito nettings, and provided information. This campaign has reached most Trio people except for those in the smaller villages (e.g. Amotopo, Lucie). The downward trend has continued in 2007, and in some communities malaria has now become as or less common than dysentery.

ACT has funded the construction of traditional health clinics in Kwamalasamutu and Tëpu as part of its 'Shamans and Apprentices Program'. In these clinics, older shamans are teaching apprentices about forest medicine and patients are treated with traditional plant-based cures.

8.7.2 Educational projects

The Dutch Foundation for Indigenous Peoples in Highland Suriname (*Stichting Inheemsen Boven-Suriname - SIB*) is supporting educational projects in Tëpu through its local partner

the Jaraware Foundation. It has set up a library/documentation center where villagers can come to read and learn Dutch. A couple of Trios of Jaraware Foundation are being trained in computer literacy and now working on an improved Trio-Dutch dictionary with the help of the founder, C. Coelewijn, who oversees and executes most projects in the field. The SIB is directed by an independent board in the Netherlands and obtains funding for its projects through book sales, private donations, and donor funding from the Netherlands.

CDFS has supported the construction of a new school building in the village of Kwamalasamutu. Early 2006 the Kapitein of Sipaliwini submitted a request for the construction of a school in his village but he has not received an answer one year later. In 2007, ACT funded school materials for all school-aged children from Sipaliwini and for the school in general. ACT has also supported the work of a volunteer to give teachers-training to four more educated villagers, as well as the salaries of these local teachers.

In Kwamalasamutu and Tëpu ACT is supporting a 'Novices program' for elementary school children. The goal of this program is to teach young Trio children practical skills and knowledge of the Trio culture. In Kwamalasamutu, for example, the children visit the traditional school biweekly as part of their regular school program. On Wednesdays days they learn craft making (weaving for boys, making jewelry for girls), and on Friday they are taught about forest medicine.

Each start the of the new school year, ACT-Suriname and some other organizations and private donors send basic school supplies to various elementary schools in the Trio area

8.7.3 Income generation projects

Figure 8.1 Brazil nut production center in Alalapadu

Since 2005 ACT is helping the community of Alalapadu professionalize its Brazil nut production by supporting the construction of a production center where the nuts are weighted and registered. ACT also flies the nuts to Paramaribo, where they are sold to both standard and occasional buyers. Due to the high costs of transportation, the production and sale of these nuts is currently not economically sustainable. In august 2007 a Peace Corps volunteer was stationed in Alalapadu to help the Brazil nut producers increase the added value of their product. He will experiment with ways to optimize breaking, processing, and packaging the nuts. Recently Kwamalasamutu and Kuruni have also asked ACT for help with the transportation and marketing of Brazil nuts.

In 2007 ACT in collaboration with the local women's group Stichting Nana started a project to help women from Kwamalasamutu improve the marketability of their

traditional jewelry. The director of ICANA, an upscale souvenir shop in the Centre of Paramaribo, provided a workshop on tourist-oriented jewelry making for women. The jewelry makers also were trained in small enterprise business administration. Some of them are now selling to ICANA.

In Tëpu, ACT is starting a ground pepper project. The goal of this project is to grow, process (dry and grind, and package various pepper species that are native to the area. ACT has financed material to construct a pepper production house. The villagers contribute labor.

Conservation International (CI) is assisting the community of Kwamalasamutu with the development of ecotourism. In collaboration with the Japan Fund, tourist lodges have been built. In a later stage of this project, CI will facilitate training in skills such as guiding cooking for tourists and guiding.

.7.4 Biodiversity conservation

Through the Suriname UNDP offices, the Global Environmental Facility has supported the development of indigenous management structures for protection of the Sipaliwini Nature Reserve (USD 50,000). Four guard stations have been constructed. The most advanced of these is the Mamia Pakoro in the foothills of the Vier Gebroeders Mountains, which is supplied with a generator, freezer, TV, and radio transmitter. Each of the four field stations was to be supplied with communication facilities, but to date this has not been realized. The Nature Management division (Natuurbeheer- NB) of the Ministry of Natural Resources will coordinate and partly execute on-the-ground management of the Nature Reserve.

Conservation International (CI) has support the above mentioned project with another USD 10,000, and written a management plan for the Sipaliwini Nature Reserve. In a recent community meeting, however, the community of Kwamalasamutu indicated to prefer working with the national government (NB) on land management and protection.

CHAPTER 9
PHYSICAL CAPITAL

Physical capital refers to the structures, infrastructure, and assets available to the community and its members. The absence or presence of these goods and services can either build an enabling environment or obstruct people's pursuit of livelihood activities. We first discuss the Trio's access to people, commodities, and information in the world outside the Trio territory, either through transportation or communication networks. Next we zoom in on the living conditions of Trio families, assessing their housing and access to public utilities: sanitation, drinking water, electricity, and waste management. The chapter concludes with a short description of dress style and the use of traditional ornaments.

9.1 Transportation and access routes

The only Trio community that may be reached over land is Sandlanding. Getting to this settlement requires following the road to Apoera, and then a 45 min-1 hour walk or a 10 minute boat ride. Before the interior war, the villages of Wanapan and Amotopo, situated along the Corantijn River, could be accessed by road from Apoera as well. Today the old road to the South is overgrown and almost undistinguishable from the surrounding forest. Even the road to Apoera is inaccessible for much of the year.

Most Trio villages are located next to airstrips and hence can be reached by plane – unless heavy rainfall floods the airstrips and makes landing impossible. This occurs several days to weeks each year, depending on the location. Wanapan is furthest removed from an airstrip. Reaching this community requires an 8-hour boat ride from Apoera. The Aviation Service (LVT) is now researching the possibilities for cutting an airstrip near this village.

Indigenous peoples used to frequently walk from one village to the other, but this habit seems to have withered with the arrival of motorized boat and air transportation. Trios do continue to walk regularly to and from the Brazilian Trio lands, particularly the village of Missão Tiryo. From Sipaliwini village, it takes one long day of walking though the savanna to reach this place.

9.2 Communication networks

The national telecommunication network consists of land lines and mobile phones, which primarily service the urban areas. None of the Trio villages is connected to a land line. Only one Trio village can be reached by mobile phone: Sandlanding. Because they regularly travel to Sandlanding, the people from Wanapan also tend to use a phone quite regularly. Half of the Sandlanding and Wanapan households owned at least one mobile

phone, and in two of these homes there were two phones. In the other Trio communities mobile phone ownership is much lower. Five and a half percent of households in Kwamalasamutu possess a mobile phone, and 8.9 percent of Tëpu households own such an asset.

Out of reach of the phone network, communication with the outside world usually occurs by two-way radio. In all Trio villages except for Lucie and Sandlanding there is at least one radio transmitter, and in the lager villages more than one. More than a third of interviewed Trio heads of households (36.5 %) said they communicate by the two-way radio on a daily basis. Another 28 percent in this group uses this medium at least once a month.

The two-way radio not only keeps the Trio in touch with relatives, acquaintances, and working relations in other villages and Paramaribo; it also is their main source of national and international news. Access to national radio broadcasting is extremely limited, and national TV programs cannot be received at all. The Apinti radio station can be received in Kwamalasamutu though regular channels, and in the other villages though the two-way radio. Yet only four percent of households listened to radio broadcasts on at least a monthly basis. One household in Sipaliwini village owns a satellite dish to receive Brazilian TV.

The national postal office Surpost does not deliver mail to any of the Trio communities. Letters to and from the villages are sent with the airplane pilots and travelling acquaintances.

9.3 Housing

The traditional Trio house has a roof made of palm leaves (Trio: *maraja*; Sranantongo: *tassi*) and an outside wall of the wood of the "podosiri" (*Euterpe oleracca*) palm tree. Plain level houses would have a dirt floor, and houses on stilts a floor made of the podosiri palm wood.

Figure 10.1 Different housing styles in the Trio villages

Traditional plain-level houses made of palm tree materials

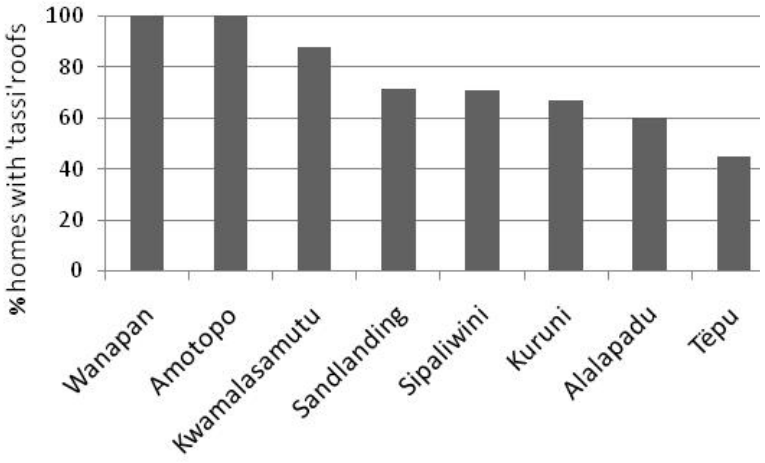
More modern Trio house on stilts with a wooden floor

Abandoned government house occupied by Trio families

With the introduction of the chain saw, those who can afford it prefer fabricating their outside walls and floors of hardwood. Another popular commodity for home-improvement is a sink roof. In addition, in the villages where the government was active during the 1960s-'70s, a couple of two-story homes of the 'Bruynzeel' type as well as other structures were built. These houses were abandoned during the interior war, and currently many are occupied by Trio families.

In all Trio villages except for Tëpu the majority of houses is covered with traditional roofing material (Fig. 9.2). In the more isolated villages of Wanapan and Amotopo, all houses are covered with woven palm leaves. Tëpu is the only village where more than half of the houses (55.4 %) has a sink roof. This observation is consistent with our findings from Chapter 8 that the inhabitants from Tëpu have relatively more money to spend on modern commodities.

Figure 9.2 Percent of houses with roofs made of woven palm leaves ('tassi')



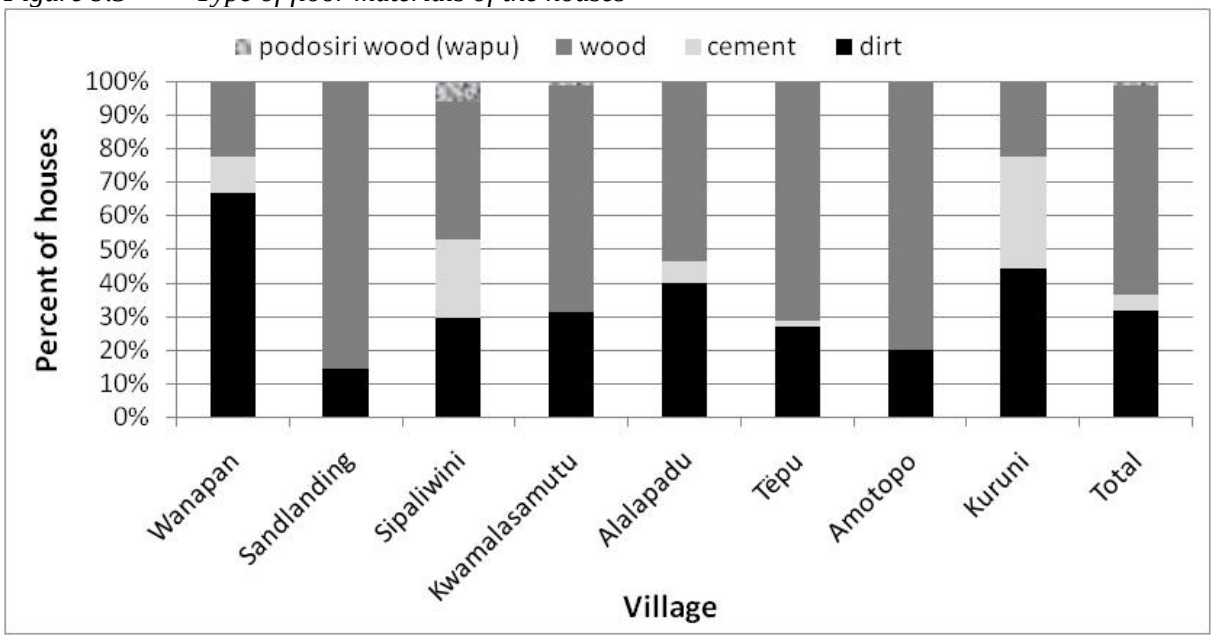
Several sink roofs observed in the villages of Sipaliwini and Kuruni belong to abandoned, rehabilitated, and newly built government houses - most of which are property of the Aviation Service (LVT). Hence they were not bought and transported by the Trios themselves. The same is true for the cement floors that are relatively abundant in these communities (Figure 9.3). In fact, none of the cement floors observed in any of the Trio communities was constructed by the Trio family living on it.

Most Trio homes are built on stilts and have a wooden floor (63.4 %). Dirt floors appear most frequently in the villages of Wanapan, Alalapadu, and Kuruni (Figure 9.3). These are among the most isolated villages with least access to a chainsaw, gasoline, and lubrication oil. Only in the villages of Sipaliwini and Kwamalasamutu did we record a house with a floor made of podosiri (local: *wapu*) palm

Two-thirds of houses have outer walls made of hardwood boards. Fifteen and a half percent of occupied houses have podosiri-wood walls, and another 13.0 % of homes have no wall at all. These houses are merely a shelter for people to hang their hammocks. Again there are substantial differences between the villages, reflecting their age, relative isolation and wealth. In Kuruni, Amotopo, and Wanapan more than 50 percent of homes is constructed of podosiri tree stems (66,7 %, 80 %, and 55.5 %, respectively). In Wanapan and Amotopo the remaining houses have no wall, while in Kuruni there also is

one house built with boards and one with cement walls. By contrast, almost all Kwamalasamutu houses (94.4 %) and 64.3 percent of houses in Tëpu have walls made of sawn boards.

Figure 9.3 Type of floor materials of the houses



9.4 Drinking water

Figure 9.4 Durotank donated by WHO/PAHO, Sipaliwini

The Surinaamse Waterleiding Maatschappij (Suriname Waterworks Company) does not supply drinking water to any of the Trio villages. Hence families rely on rain water in the rainy season, and on rivers and creeks in the dry season. Less than half (35.5 %) of the Trio homes has its own *durotank* (water bin) to collect rain water though, and hence many tanks are shared among extended families. For example, the village of Wanapan owns one durotank for all families. With seven households relying on its contents, this bins rapidly empties, especially in the dry season. Often the water collection bins are not properly sealed and cleaned, which may affect the quality of the drinking water collected in them.

In the dry season Trio families use river and creek water for drinking and all household needs. They usually get this water just a few meters (if any) removed from the shore side where they wash their dishes, do laundry, and bathe. When asked about the use of

this water, villagers said they first let the water stand for a while, and then when all dirt has settled, they will boil the clearer water for a while. We do not know whether they gave us the desirable answer or are really taking this much caution.

In Tëpu, the MZ has constructed a water-system that supplies the clinic and delivers water to a couple of common taps close to the clinic. ACT is currently constructing a community-wide water system for Kwamalasamutu

9.5 Sanitation

Figure 9.5 Outhouse in Sipaliwini

Sanitary conditions are substandard throughout the Trio territory. In all villages, people urinate practically anywhere, as long as they are some meters removed from houses and out of sight. In most communities there are shared outhouses for defecation. However, as these natural toilets are rare and typically smelly and dirty, virtually everyone relies on the river or the forest - where a small burrow is dug.

Of all villages, Tëpu has the best toilet facilities. In this community 91.1 percent of households reports (shared) ownership of a restroom - one of which is an indoor flush toilet. Between half and three-quarters of families of Alalapadu, Amotopo, and Kuruni have access to an outhouse. In addition, two Kuruni families reported the use of an indoor toilet.

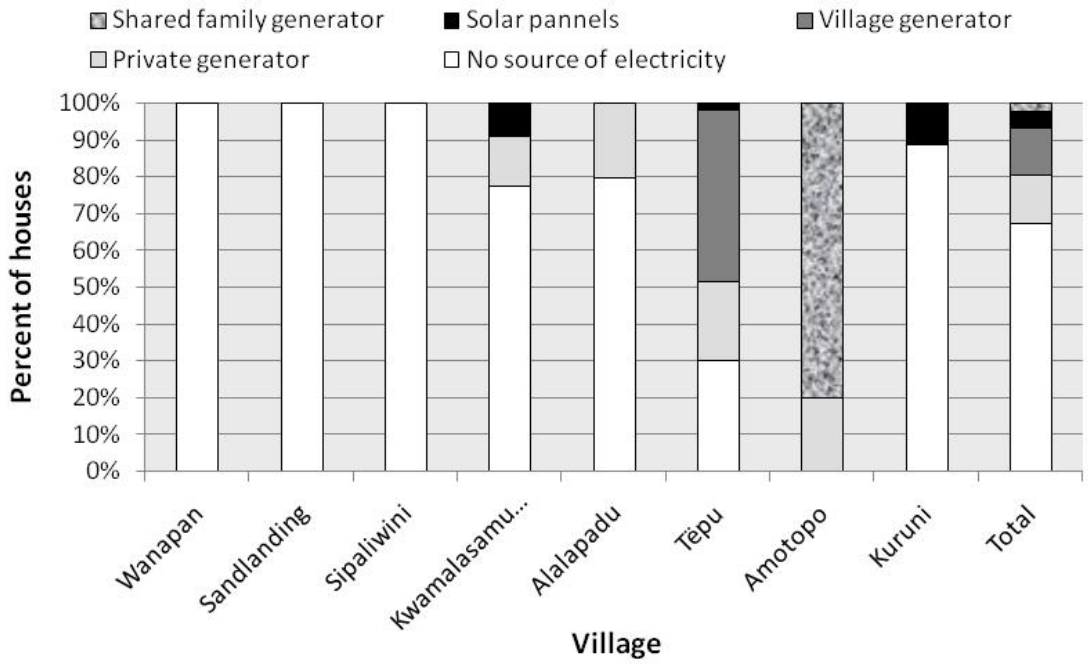
There is one common outhouse in the village of Sandlanding. This place appears unhygienic and does not seem to be used by many people. The one outhouse we observed in Sipaliwini is, despite its clean appearance, hardly used by any-one. Instead most villagers use the forest. There is no outhouse in Wanapan. The restrooms belonging to the MZ clinics and new Kwamalasamutu school are among the few facilities that meet general hygiene standards.

Recently (May 2007) the Minister of Regional Development called upon the interior populations to refrain from defecation in the rivers as the presence of human feces constitutes a health hazard when the water is being used for bathing, washing dishes, and drinking. Trios are unlikely to respond to this call, however, as long as general hygiene awareness is low and proper outhouses are absent.

9.6 Electricity

Like other features of Suriname's public infrastructure, the provision of electricity is concentrated on the coastal area. The most important source of electricity is the hydropower plant at Afobaka, owned and operated by the Suriname Aluminum Company (Suralco). In addition to using the energy for its bauxite production, Suralco sells a portion to the state electricity company Energie Bedrijven Suriname (EBS), accounting for 85 percent of the EBS' energy supply[36]. The second most important sources of electricity are two EBS-operated power generators, which deliver about 10 percent of national energy production.

Figure 9.6 Access to electricity in Suriname Trio villages



The remaining 5 percent of Suriname's energy production is through smaller power generators supplied by the Ministry of Natural Resources to villages in the interior. In the study area, only the village of Tëpu has a working village generator. This generator is in theory supplied by the government with fuel. Public cash flow problems make that Tëpu lacks electricity for most of the year. Moreover, not all households in the villages are connected to the village generator.

In 2005, the National Democratic Party (NDP) donated a large generator to the village of Kwamalasamutu two weeks before Election Day. This generator has not been connected to any of the houses and is not supplied with fuel. In addition to these public generators, better-off households own private generators (13.5 % of households) or solar panels (4.8 % of households).

[36] Apura Networks Homepage. URL: www.apura.org

Figure 9.7 Amotopo house connected with a cable to the shared family generator, which provides electric light in the evening hours - if fuel is in supply.

The majority of households (67.3 %) do not have access to any form of electricity. This group includes all families from Wanapan, Sandlanding, and Sipaliwini. Ownership of private energy sources (solar or fossil fuel) is most common in Tëpu, Kwamalasamutu, and Alalapadu. The five households from Amotopo -one extended family- share one private generator (Figure 9.7).

9.7 Clothing, ornaments, and body painting

Traditionally, Trio men dressed in a red loincloth drawn between the legs and fastened by a cord around the waist. Women also went naked above the waist, wearing only the *keweyu*, an apron leaving the buttocks exposed, or a *kamisa*, a short wrap-around the waist. Children under the age of six usually went totally naked.

In part due to missionary influences (see Chapter 3), few Suriname Trio still wear the traditional dress. A few elderly men continue to dress regularly though seldom exclusively in traditional clothing. The average Trio man, however, wears shorts or jeans with a T-shirt. They walk on flip-flops most of the time but may change these for more expensive sneakers on special occasions or when traveling to town. Women cover their upper bodies -many even when bathing- with a top or T-shirt, and further wear a skirt or shorts. In other words, if it were not for their characteristic facial features, the Trio would be hard to recognize in town.

Modern Trios only might wear traditional clothes, head dresses, and body-paints at special festivities and ceremonies. Even then, they will often wear Western underwear beneath their loincloth or *keweyu* and particularly teenagers may not participate. Traditional jewelry – or modern variations of these ornaments- continue to be popular among woman and men.

In the past few years ACT has stimulated the use of traditional dress during indigenous festivities. For example, the organization supported the celebration of International indigenous day (august 9) 2007 in the village of Sipaliwini with food, drinks, red cloth, and the transportation of guests. On this occasion, the village Kapitein summoned everyone to dress up and for days in advance, the villagers were making traditional head dresses and ornaments. Many of them had not worn the traditional Trio outfit for years, and for many children it was the first time they dressed in a *kamisa*. Apart from having fun, these parties teach young people about their traditional music, dance, and dress.

Figure 9.8 Traditional clothing, ornaments, and body painting during the celebration of international Indigenous peoples' day in Sipaliwini, 7-8 August 2007. Typical features include the red loincloths, parrot feathers, and white fluffy falcon feathers stuck to the hair and face.

CHAPTER 10
SYNTHESIS

This synthesis compiles the findings from the previous chapters. We first expose vulnerabilities and problems in the target communities, and then identify capacities, resources and opportunities to overcome these problems and improve the sustainability of Trio livelihoods.

10.1 Vulnerabilities, problems, and risks

Vulnerabilities are trends and shocks that affect peoples' livelihoods. These trends and shocks are typically unanticipated, that is, people cannot foresee them. An example is the flooding of May 2006, which destroyed the harvests of many interior inhabitants. Shocks also tend to occur unexpectedly; people may know they might happen but do not know when. An example is the cyclical occurrence of leaf-cutter ant plagues. The erratic nature of these events makes that local people have little or no control over them, even when they occur repetitively.

Problems are issues that hinder peoples' pursuit of livelihood objectives. For example, Trio parents' desire to formally educate their children is obstructed by a variety of problems, including the poor educational infrastructure in the interior, the parents' own low educational achievement, and a lack of money to send the child for education to the capital city. Risks are issues that may become problems if they are not being addressed. For example, HIV/AIDS zero-prevalence rates are low in the Trio community. However, high sexual activity rates coupled with low condom use create the conditions in which HIV/AIDS is likely to become a problem.

10.1.1 Natural capital

Suriname does not have a history of natural disasters. However, the floods of May 2006 demonstrated that extreme climatic events can harm the food security of Trio households. Neither the Trio nor the national government proved to be fully prepared for this event. The current lack of food stocks increases the vulnerability of the Trio to recurring problems that may cause additional crop loss such as pests, drought or excessive rainfall. In dry years, there are shortages of clean drinking water. As climate change is likely to bring more extreme weather, it is necessary that the Trio develop adaptive strategies to increase their resilience against climatic shocks.

During the last decades, the need for a regular cash income to obtain modern-day products in the Trio communities has grown. In some of the settlements, trade in wild animals has become a main source to meet this need. No in-depth research has been performed, but the threat that wildlife trade poses to local animal populations merits monitoring.

A next source of vulnerability is the Trios' dependency on ever decreasing wildlife resources for consumption in settlements with a high population concentration. Trios are no animal breeders. Instead, wild-caught animals and fishes make up 90-100 % of the animal diet, with larger animals being preferred. Population concentration and the use of modern hunting and fishing methods (e.g. shotgun and nylon fishing nets) have elevated the pressure on wildlife and fish resources. In Kwamalasamutu, it is believed that the population is too large to maintain a situation of guaranteeing wild food security.

Population growth in the settlements with a high population concentration will also cause more pressure on agricultural land. This puts tremendous pressure on people to shorten fallow periods, which results in smaller yields. Longer fallow periods and the use of adjusted agricultural methods may reverse this negative trend. To guarantee a better food security, the Granman of Kwamalasamutu already took action to move a part of the population to other (newly erected) villages, to prevent further depletion of the resources.

It would take a more extensive study to assess the present ecological awareness of the Trio. Nevertheless we did observe many signs of a loss of ancient knowledge about the use of surrounding fauna and flora in the new generations. The changed standard of living with modern-day products requires new forms of ecosystem management, based on a basic understanding of ecological processes and modern environmental problems. As ancient ecosystem knowledge is lost and modern environmental values are not acquired, unsustainable land use and environmental pollution are likely to occur.

Last, the lack of legal rights to the territories and resources they depend upon leaves the Trio particularly vulnerable in their access to natural and financial capital; their lands may be offered as concession to third parties, or be destined for national development at any time. The lack of land titles also inhibits enterprise development.

10.1.2 Human Capital

The educational situation throughout the Trio area is depressing to young indigenous children and their parents. Children in Sipaliwini, Kuruni, Amotopo, Alalapadu, and Lucie have not had a chance to go to school for several years. The children of Wanapan, who attend school in Apoera, are removed from their parents from a young age and for several years. The children of Kwamalasamutu and Tëpu who are lucky enough to go to school have reduced chances of personal development as compared to urban children due to limitations to human and material resources in the schools. The option to obtain secondary education and beyond is closed to the grand majority of Trio children. This situation is a violation of the UN Convention on the Rights of the Child, which Suriname ratified on 31 March 1993, and which states in Article 28, section 1:

> "States Parties recognize the right of the child to education, and with a view to achieving this right progressively and on the basis of equal opportunity, they shall, in particular:
> (a) Make primary education compulsory and available free to all;

(b) Encourage the development of different forms of secondary education, including general and vocational education, make them available and accessible to every child, and take appropriate measures such as the introduction of free education and offering financial assistance in case of need;
(c) Make higher education accessible to all on the basis of capacity by every appropriate means; …"

The denial of Trio children's access to education also obstructs Suriname's progress towards the Millennium Development Goals. Due to their low educational achievement and lack of practical training opportunities in most Trio communities, Trio adults are disadvantaged in their access to formal employment, advancement, and political voice in Suriname society - all of which perpetuate their vulnerability.

The main health problems in the Trio area are poor nutritional health (e.g. vitamin deficiency); viral, bacterial, and parasitic infections; malaria; common colds and flu; and diarrhea. In addition, we identified a variety of sexual and reproductive health risks, including early teen pregnancy, a tendency among particularly young girls to perform unsafe home-abortions, a preference for consanguineous marriages, rape, frequent unsafe sexual encounters, and low contraceptive usage in general. In the long run these behaviors are likely to harm the heath of all Trio, but particularly young mothers and their (unborn) babies. They also make the Trio community very vulnerable to the spread of HIV/AIDS – which has not yet manifested itself on a grand scale.

Despite an increase in governmental resources allocated to improving health and health care in the interior in latest years, not all Trio communities have access to public health facilities. Even in emergency cases, the people of Wanapan, Amotopo and Lucie have to travel eight hours by boat to the nearest doctor – given that there is a boat, an outboard motor, and fuel available. In this context, it is worrisome to find that few Trios still possess traditional knowledge to cure common diseases such as a cold and diarrhea. ACTs shaman's apprentice program has been successful in regaining respect for traditional medicinal knowledge and promoting its transfer, but is not yet self-sustaining.

Under influence of the Baptist church, the Trio have for long abstained from traditional cultural expressions such as music, dance, and storytelling. Children and youngsters are no longer familiar with ancient traditional tales, myths, and cosmology. If this trend continues, the Suriname Trio will have lost their cultural heritage within two or three generations. Examples from the US and Canada forewarn that indigenous societies that are not fully assimilated into national society but also have lost pride in their indigenous identity, are likely to experience high levels of violence, crime, and suicides.

10.1.3 Social capital

An key source of vulnerability for the Trio community is its limited political voice within the Central Government of Suriname. Their traditional authorities are recognized as such by the Government in practical matters, but their role is not defined on paper. Hence they

have no power to influence policy decision about the Trio area, no operational budget, and no formal right to speak justice in their communities. The degree to which they are taken into account and consulted during development planning depends on the personal opinion from the government official or executive leading the process. Within the Central Government, the Trios only are represented by lower level officials from the District Secretariat Sipaliwini and the Ministry of Regional Development. These officials facilitate the communication between the traditional authorities and the central government but have no power to affect policy.

Also within most national indigenous interest groups the Trio are poorly represented as few Trios are on the board and informed and/or consulted regularly about the group's activities. The Trio and Wayana interest group TALAWA is managed entirely by Trios and Wayanas. It remains unclear, however, to what extend TALAWA responds to the needs of the entire Trio community or merely those of its leaders. Also at the community level the Trios are poorly organized. There are few community-based organizations and those that do exist have few members and their activities are little known.

Crime is generally low but becoming ever more common, particularly in the large village of Kwamalasamutu. In this community we recorded, among others, theft, the use and sale of soft and hard drugs, prostitution, domestic violence, sexual molest of minors and rape. The virtual absence of sports and leisure activities for youth presents an additional risk factor, as this age cohort is most likely to resort to petty crime to fight boredom. In the absence if national law enforcement agents, the traditional authorities decide on guilt and punishment through village meetings, usually with the aggrieved party. The large distance to the nearest police and/or military post presents an additional security risk for the communities.

The Suriname government does not have a long-term policy strategy to cushion either household shocks or community- and region-wide disasters in the interior. Also within the Trio community, community-based organizations for socio-economic support and (semi)formal self-help groups are rare and have limited membership. The limited presence of social safety nets leaves the Trio poorly prepared to cope with unexpected misfortune.

Social cohesion in Trio communities is threatened by the decreasing transfer of cultural values and traditions from elders to youngsters. Children and youngsters are no longer familiar with ancient traditional tales and myths.

10.1.4 Financial Capital

In the absence of banks and other financial infrastructure in the Trio area, it is difficult for Trio individuals to save money in a bank account, to take out a loan, to regularly receive their social welfare payments, or to involve in any other form of household or business financial management.

Also wage labor opportunities are virtually non-existent in the Trio area. As a result, the Trio rely heavily on their natural environment for income. This situation may lead to the unsustainable harvest of birds, reptiles, and wildlife species for sale in Paramaribo and abroad, particularly in the communities of Sipaliwini and Tëpu. The populations of Amotopo and Lucie are still too small to present a real threat to wildlife. Without alternative sources of income for Trio men, wildlife trade is not likely to diminish.

Its dependence on ACT to transport Brazil nuts for marketing makes places Alalapadu in a vulnerable position; if ACT ceases to exist tomorrow, over 90% of men and women from this village will be out of income. The fabrication of handicrafts -indigenous jewelry and hammocks- is practically the only source of income for women in all villages other than Alalapadu. The lack of variation and originality in their products increases competition between women and makes them depend on an unpredictable tourist market. Tourists fairly regularly visit the surroundings of Sipaliwini, Kwamalasamutu, Amotopo, Lucie, and Wanapan. None of the tour operators leading people to these sites is a Trio though, and few Trios earn anything from the tourism business other than a few dollars from the sale of souvenirs.

The lack of income generating opportunities for women and men may increase people's willingness to allow gold miners to work near the villages or endorse other non-sustainable resource use by outsiders – though so far this has not happened.

BHP Billiton Maatschappij Suriname is planning the construction of a large bauxite mine in the Bakhuys Mountains. The village of Sandlanding is the only Trio settlement to experience direct impacts, mostly from the construction and use of a harbor facility near the village. If a hydropower facility is built to provide energy to a possible aluminum smelter, all villages along the Corantijn River will be affected and the village of Wanapan would even have to disappear. In the absence of formal rights to their lands, consultation with and compensation for the Trio will be left to the arbitrary goodwill of the government and the company executing the project.

In all villages, Trio families have come to a greater or lesser extend come to depend on manufactured goods, particularly in Kwamalasamutu. Their reliance on these commodities has created a large degree of dependency on both cash income and transportation to the city (yet more cash), both of which are unreliable as few Trios have stable jobs and airplanes cannot land throughout the year. Moreover, presently many Trios rely on a free ride to town and/or the free mailing of packages on planes chartered by NGOs or private businesses working in or near their village – again increasing their dependence on the behavior of third parties.

Donor assistance is direly needed but also poses a risk of creating passivity in the community; people no longer develop strategies to overcome current and anticipated problems because either '*lanti*' (the government) or NGOs are expected to step in. There is little capacity within the Trio community to design and manage donor projects and to proactively search for funding for community development.

10.3.5 Physical capital

The Trio are isolated in every meaning of the word. They are physically isolated by the lack of access roads and by the high prices for transport to the area. They also communicatively isolated by the absence of telecommunication networks in the area. In addition, as the Trio cannot receive any TV, newspapers, and most radio broadcasting, they are deprived from national and international news and other relevant information. Their multi-facetted isolation leaves the Trio vulnerable to external shocks such as price changes, weather events, and planned development activities in the interior. Not knowing when, where, and how these events will occur also decreases the Trio's ability to adaptively respond to them.

Poor access to clean drinking water and sanitation present a public health hazard in all villages. None of the villages has a proper system to dispose of human and inorganic waste, again threatening public health.

The lack of a consistent source of electricity inhibits entrepreneurship and other development in the Trio communities. The absence of a reliable drinking water source, poor sanitary and sewage conditions, and a lack of waste management present a threat to public health.

Like cultural knowledge, also knowledge of traditional material culture is rapidly disappearing. Traditional jewelry is the only part of the traditional dress that continues to be made and worn. If this trend continues, the Suriname Trio will have lost their cultural heritage within two or three generations.

10.2 Opportunities, capacities, and resources

The Trio have access to various opportunities to overcome the listed vulnerabilities and to both material and immaterial assets that may help the communities overcome problems in the pursuit of their livelihood objectives.

10.2.1 Natural capital

Although inhabitants of the Trio area adapt more and more to the modern way of living, the forest still plays a central role in their daily life and their traditions. Trios still use wild plants in the surrounding forest for the construction of houses and canoes, for the production of woven utensils, to prepare medicines and pesticides, to collect natural jars, brooms, fibers, firewood, body care products and to gather food supplements. In villages other than Kwamalasamutu there is no evidence that the resources the Trio need for their daily sustenance are being depleted. Also current agricultural practices seem to be sustainable.

Forest resources, especially the wild plants which are currently hardly used commercially, may be used for income generation. The Trio land areas provide many opportunities for the development of NTFP's, such as honey, Brazil nuts, oils, fruits, crafts and medicines. There are also opportunities in the Trio area to develop well considered eco-tourism activities.

The Trio also could play a stronger and more formal role in the protection and management of their biologically rich territories, particularly the Sipaliwini Nature Reserve and the Central Suriname Nature Reserve. In collaboration with the government, Trios could be trained as park guards to vigilance these vast, empty areas. Regular patrolling is not only direly needed in the national parks – which at present are virtually unprotected – but also in Suriname's border lands. The villages of Sipaliwini near the Brazilian border, and the Corantijn villages on the border with Guyana, are strategically located to become governmental border posts.

10.2.2 Human capital

Literacy is high among the Trio. Being able to read and write will facilitate learning of Dutch, Suriname's national language. Speaking and reading in Dutch is important because it opens access to information and income generation. Quite a few men and women already speak some Dutch, which provides an opportunity for community based language classes. Also, even though educational achievement is generally low, in every community there are people who have had some years of elementary school and could be mobilized for either adult or child education, particularly where there are no schools. The Peace Corps worker currently stationed in Alalapadu has voiced the intention to help set up a community school in this village.

The Trio generally enjoy good health; a condition that must be cherished. The church is an influential institution and can become a venue for the delivery of health education, particularly in the area of sexual and reproductive health. Awareness campaigns on the reduction of early teen pregnancies, contraceptive use, and HIV/AIDS prevention would be particularly useful. Even though few practicing *pïjai* are left, knowledge of medicinal plants is still present among Trio shamans and some elders. It is a challenge to the community to preserve this knowledge for future generations – also outside the traditional health clinics. Organizations concerned about cultural preservation such as ACT can be a resource in helping secure this ancient knowledge for future Trio generations.

10.2.3 Social capital

The Trio become ever more vocal in national politics. On various occasions in the past few years the Trio Granman and some of his Kapiteins have personally discussed community needs with the country's highest political leaders, as well as with important international players such as the US ambassador. These meetings not only have brought

the Trio under the attention of Suriname's politicians, but also have given the traditional leaders a stronger feeling of self-esteem and pride in their indigenous heritage.

The recently established Trio and Wayana foundation TALAWA provides an opportunity to more pro-actively place the interests of the Southern Indigenous Peoples on the national political agenda. In the near future, this interest group could develop a political arm and participate in the national elections, in collaboration with other parties with a large constituency in the interior. In this context, the current government position of the Maroon political party A-combinatie should be used as an opportunity to build political liaisons and draw government support for the Trio community. TALAWA also will serve as a useful contact point for organizations wishing to develop -either private business or charity- projects in the area.

The various Trio communities are safe, have a low crime rate, and still have low incidences of drugs use and alcoholism. Various forms of deviant behavior, however, are on the rise, particularly in Kwamalasamutu. Traditional authorities, the church, and community members should mobilize to design crime prevention strategies before problems escalate. The recently established park guards unit at Kwamalasamutu is a valuable asset in crime prevention.

Socialization at kasiri parties and in church continues to be a favorite past time, and is important in keeping the social fabric of Trio communities together. Such social cohesion is crucial in the maintenance of traditional safety nets and the development of modern strategies to insure the community and its members against shocks such as harvest failure. Granman Asongo's leading role in designing community based self-help strategies, for example by sending families to other places to plant, is positive and should be encouraged.

10.2.4 Financial capital

The natural environment provides many opportunities for sustainable income generation. Several villages have commercially viable stands of Brazil nuts that can be harvested in a sustainable manner. An added opportunity is the assistance of a Peace Corps volunteer, who will stay for two years in Alalapadu to help optimize Brazil nut processing for added value. If successful, this experience can be transferred to Kuruni and other villages with a potential and interest in Brazil nut production.

In addition to the development of NTFP's ecotourism has a potential to provide more direct and indirect income to Trios. The Trio area contains unique national parks, archeological sites, and numerous unspoiled, beautiful spots with a diverse plant, bird, and wildlife diversity. If properly marketed, these areas could attract many more tourists than they do now without exceeding the carrying capacity. The Trio should ensure they become partners on current and future tourist arrangements and earn by providing lodging, guiding, transportation, catering, and other services – rather than merely selling some forest beads.

The construction of a bauxite mine at Bakhuys and auxiliary activities may provide employment to the villagers of Sandlanding.

The Trio now more frequently travel to the coast. In addition to buying items, these trips are used to bring their handicraft for sale to town. An appropriate venue (e.g. tourist shops or the Central Market) must be researched to market these items. An ACT-sponsored training module by an influential souvenir shop owner has helped female jewelry makers professionalize their production and marketing strategy.

The Trio communities are eligible for the aid of several donor organizations that are active in Suriname. Assistance to Trios in community development planning, project proposal design, and project management could both attract more funding and reap greater benefits from the same amount of funds. Furthermore, we find that in every community some members are wealthier than others. The traditional authorities could elicit financial support from these relatively well-to-do Trios for community development, for example through a local taxation system. Such a community taxation fund would reduce dependency on donor organizations, particularly in emergency situations.

10.2.5 Physical capital

Foot paths between the various villages are rarely used nowadays, but still known. These paths will be strategically used by the park guards (see above). Almost all villages have a radio transmitter to make contact with the city if needed.

Throughout the Trio territory people are skilled in building traditional homes. Hence for house construction they do not depend on imported goods – though many people nowadays do like to use nails. The newly constructed water system in Kwamalasamutu is an important asset in reducing diarrhea, stomach aches, and other water-related health complaints among Trio children –and adults- in this village. In the past three years, both governmental and non-governmental organizations have constructed water-systems in several interior villages. Trio authorities should make use of this trend and more pro-actively search for funding to realize such a project in their communities.

Many adults still know to make and wear the traditional dress such as the *keweyu* and *kamisa*. While we do not want to urge the Trio to exchange their jeans and T-shirts for the traditional loin cloth, dressing up in the traditional dress can be a fun activity during festivities, and may help re-establish appreciation for the rich Trio culture. Dressing up also could be strategically used, for example, when press coverage is important.

BIBLIOGRAPHY

ABS
2005a Zevende Algemene Volks- en Woningtelling in Suriname. Landelijke Resultaten. Vol. I. Demografische en Sociale karakteristieken. Suriname in Cijfers no 213-2005/02. Algemeen Bureau voor de Statistiek/Censuskantoor: Paramaribo, Suriname

ABS
2005b Zevende Algemene Volks- en Woningtelling in Suriname. Landelijke Resultaten. Vol. II. Werkgelegenheids- en Onderwijskarakteristieken. Suriname in Cijfers no 216-2005/05. Algemeen Bureau voor de Statistiek/Censuskantoor: Paramaribo, Suriname

ABS
2006 Zevende Algemene Volks- en Woningtelling in Suriname. Landelijke Resultaten. Vol. IV. Huishoudens, Gezinnen, en Woonverblijven. Suriname in Cijfers no 221-2006/03. Algemeen Bureau voor de Statistiek/Censuskantoor: Paramaribo, Suriname

Alonso, L. E. & J.H. Mol (eds.)
2007 A rapid biological assessment of the Lely and Nassau plateaus, Suriname. RAP Bulletin of Biological Assessment 43. Conservation International, Arlington, VA, USA.

Amazon Conservation Team Suriname
2007a Trio territorial map of South-west Suriname. Paramaribo, Suriname: Amazon Conservation Team Suriname and Trio peoples of Suriname

Amazon Conservation Team Suriname
2007b Wayana Baseline Study. A sustainable livelihoods perspective on the Wayana Indigenous Peoples living in and around Puleowime (Apetina), Palumeu and Kawemhakan (Anapaike) in Southeast Suriname. Paramaribo, Suriname: Amazon Conservation Team Suriname

Amazon Conservation Team Suriname
2006a An Analysis of the Land Rights of the Indigenous Peoples and Maroons in Suriname. Adaptation of Legislation in Suriname. Paramaribo, Suriname: Amazon Conservation Team Suriname

Amazon Conservation Team Suriname
2006b Land Management in the Trio Indigenous Communities of Suriname, Paramaribo, Suriname: Amazon Conservation Team Suriname

Amazon Conservation Team Suriname
2005 Rights to land and resources for Indigenous peoples and Maroons in Suriname. Paramaribo, Suriname: Amazon Conservation Team Suriname

Amazon Conservation Team Suriname
2003a Kwamalasamutu: An analysis of Governance, Resource management and Development Issues. Paramaribo, Suriname: Amazon Conservation Team Suriname

Amazon Conservation Team Suriname
2003b Ecological Survey of the Trio territories. Paramaribo, Suriname: Amazon Conservation Team Suriname

Andel, van T.R., MacKinven A.V. & Bánki O.S.
2003 Commercial Non-Timber Forest products of the Guiana Shield. An inventory of commercial NFTP extraction and possibilities for sustainable harvesting. Netherlands Committee for IUCN.

Baal, F.L.J. & M.M. Held
1995 Conservation and sustainable use of wildlife in Amazon countries. National Report of Suriname. 74 pp.

Baal, F.L.J. & M.M. Hiwat
1996 Export of wildlife from Suriname. Rapport LBB/NB, Paramaribo. 18 pp.

Bakker, Eveline, Leo Dalhuisen, Ronald Donk, Maurits Hassankhan, and Frans Steegh
1998 Geschiedenis van Suriname: van Stam tot Staat (History of Suriname: from Tribe to State). Walbutg Pers: Zurphen, Netherlands

Berenstein, H.J.
2005 Veldgids over de zoetwatervissen van het Centraal Suriname Natuur Reservaat. Conservation International-Suriname: Paramaribo, Suriname

BHP Billiton Maatschappij Suriname
2007 Bakhuys Exploration Area. Visit by Environmental Organizations. 17 / 18 January 2007. Powerpoint presentation.

Bittles, Alan H. & James V. Neel
1994 The costs of human inbreeding and their implications for variations at the DNA level. Nature Genetics 8, 117 - 121

Boedhram, N.
1988 Climate. In Suriname Plan Atlas, map B3 and text.

Boven, Karin and the Trio communities of Kwamalasumutu and Tëpu
2001 Samuwaka herdacht. Een geschiedenis van het trio volk. Paramaribo, Suriname: Amazon conservation Team and Center for the Support of Native Lands

Brands, A.
1969 Korte beschrijving van de thans in gebruik zijnde methode van landbouw bij de Bovenlandse Indianen in Suriname.

CITES
2007 Website. URL: www.cites.org

De Dijn, B.
2006 Suriname national bio trade assessment. Website, URL: www.biotrade.org/regional/amazon/consultants

Duplaix, N.
2001 Evaluation of the animal and plant trade in the Guayan Shield ecoregion: Preliminary Findings. WWF Guianas Forest and Environmental Conservation Project, Paramaribo

Goodland, Robert
2006 Suriname: BHP Billiton/Suralco's Bakhuys Bauxite Mine Project. A Review of SRK's Environmental and Social Assessment Transport and Scoping Document. Report. VIDS and NSI

Grant J.C and Bittles A.H.
1997 The comparative role of consanguinity in infant and childhood mortality. Annuals of Human Genetics 61: 143-149

Haverschmidt, F. and G.F. Mees
1994 Birds of Suriname. Vaco N.V.: Paramaribo, Suriname

Inter American Development Bank (IADB)
2005 Website, URL: www.idbdocs.iadb.org

IUCN
2006 Red list of Treatened Species. IUCN, Cambridge. Web site. URL:www.redlist.org

Klooster van 't C. & Lindeman, J.C.
2003 Index of vernacular plant names of Suriname. Journal of plant taxonomy and plant geography. BLUMEA supplement 15. Nationaal herbarium Nederland, Universiteit Leiden

Kroonenberg, S.B.
1976 Amphibolite facies and granulite facies metamorphism in the Coeroenei-Lucie area, southwestern Surinam. In: Geologisch Mijnbouwkundige Dienst Suriname , mededeling 25, pag. 109-289

Kroonenberg, S.B.
1975 Preliminary note on the geology of the Coeroeni-Lucie area, SW Suriname. In: Contributions to the geology of Suriname 4, Geologisch mijnbouwkundige dienst van Suriname. Mededeling 23.

Lindeman, J. C. & A.M.W. Mennega
1963 Bomenboek van Suriname. Dienst ‘s Lands Bosbeheer, Paramaribo.Kemink en Zoon, Utrecht.

Lindeman, J. C. & S.P. Moolenaar
1959 Preliminary survey of the vegetation types of Northern Suriname. Van Eeden Foundation, Amsterdam. 45 pp. Also as: The Vegetation of Suriname Vol. I (2). Also as: Communications of the Botanical Museum and Herbarium, State University Utrecht, no 159.

Maas, K. & G.J. van der Lingen,
1975 Geology of the Sipaliwini Savannah area, South Suriname. In: Contributions to the geology of Suriname 4, Geologisch mijnbouwkundige dienst van Suriname. Mededeling 23.

Mayor, Susan
2004 Pregnancy and childbirth are leading causes of death in teenage girls in developing countries. BMJ 2004;328:1152 (15 May)

Meteorologische Dienst Suriname
2007 Climate data for selected weather stations.

MEU
2001 Jachtkalender van de Tareno's voor de gebieden Sipaliwini-Mamia, Kwamalasamutu, Curuni, Wonotobo en Kaysergebergte. Bijlage II in: Global Environment Facility - Small Grants Programma. Project "Mamio Pakoro". Behoud van de waarden van het Sipaliwini savannegebied en duurzaam-toerisme-ontwikkeling in de Sipaliwini savanne. Stichting MEU Kwamalasamutu.

Milliken, W.
1998 Ethno-ecological surveys in indigenous reserves in the Brazilian Amazon. A methodology. Second Draft. Edinburgh Development Consultants on behalf of UNDP.

Mittermeier, R.A., S.A. Malone, M.J. Plotkin, F.L.J. Baal, K. Mohadin, J. MacKnight, M.C.M. Werkhoven & T. Werner
1990 Conservation Action Plan for Suriname. Conservation International, Suriname Forest Service, World Wildlife Fund, Foundation for Nature Preservation in Suriname, University of Suriname. 45 pp. Addendum (typoscript) 1991 by F.L.J. Baal.

NARENA
2003 Vegetation map

NARENA
2005 Map of gold mining concessions

Nowak B. and B. Shultz
1999 Tropische vruchten, groeiwijze, toepassing, kweken en oogsten. Uitgeverij TIRION - NATUUR

Ostendorf, F.W.
1962 Nuttige Planten en Sierplanten in Suriname. Bulletin van het Landbouwproefstation No 79.

Parahoe, M.
2001 Agro-biodiversity and relationship of people with the environment. A comparison of the Kwinti maroons and Trio indigenous people, Suriname. Project 'Integrated urban and rural environmental management' programme, Mona Campus of the University of the West Indies, Jamaica. 122 pp.

Phipps, Maureen G., Maryfran Sowers, Sonya M. DeMonner.
2002 The Risk for Infant Mortality among Adolescent Childbearing Groups Journal of Women's Health, 11(10): 889-897

Plotkin, M.J.
1986 Ethnobotany and conservation of the tropical forest with special reference to the Indians of Suriname. Unpublished doctoral thesis, Tufts University, Boston, MA. U.S.A.

Ribot, J-H.
2007 Website on the birds of Suriname. URL: www.tem.nhl/~ribot/ned/index.htm

Rohwer, J.
2002 Tropische planten: bomen, struiken en voedselgewassen. Uitgeverij TIRION – NATUUR

Stoltenberg, Camilla, Per Magnus, Anders Skrondal, and Rolv Terje Lie.
1999 Consanguinity and Recurrence Risk of Still Birth and Infant Death. American Journal of Public Health, 89: 517-523

Scherpenzeel, C.W.
1977 Klimaat. In: C.F.A. Bruijning en J. Voorhoeve, eds. Encyclopedie van Suriname, p 338-347.

SPS
1988 Suriname Planatlas. Ed. Stichting Planbureau Suriname (SPS)/ Organization of American States (OAS). Washington. 33 pp, 25 maps. Map Rainfall, Map Geology and Map vegetation

Teunissen, P.A.
1980 Serie Surinaamse ecosystemen. Deel VII: Savannes. Instituut voor de Opleiding van Leraren (IOL), Paramaribo.

Teunissen, P., Noordam, D., Van Troon, F.
2003 Ecological Survey of the lands inhabited/used by the Trio people of Suriname. Physical and biological resources, their current use, and recommendations for a development plan. Foundation Amazon Conservation Suriname

Troon, F. van
1984-5 Forest field records in the Trio area

Veer, W.
2003 Vruchten en meer in Suriname. STINASU

Vereniging van Inheemse Dorpshoofden (VIDS)
2007 West Suriname: Wat betekend een geïntegreerde aluminium industrie vor de inheemse gemeenschappen? Paramaribo, Suriname: VIDS and NSI

Versteeg, Aad H.
2003 Suriname before Columbus. Libri Musei Surinamensis 1, Paramaribo, Suriname

Werkhoven, M.C.M. & Baal, F.L.J.
1995 Biodiversity Conservation and management in Suriname. Website, URL: www.unesco-suriname.org

Weitzner, Viviane
2007 Determining our Future, Asserting our Rights: Indigenous Peoples and mining in West Suriname. The Asssociation of Indigenous Leaders in Suriname (VIDS) and the North-South Institute.

World Wildlife Fund (WWF)
2003 Wildlife Management. D-ROM.

Xi-Kuan Chen, Shi Wu Wen, Nathalie Fleming, Kitaw Demissie, George G Rhoads, and Mark Walker.
2007 Teenage Pregnancy and Adverse Birth Outcomes: A Large Population Based Retrospective Cohort Study. International Journal of Epidemiology, 36(2):368-373

Zwart, E.
1981 Mogelijkheden en onmogelijkheden voor de ontwikkeling van de Bovenlandse Indianen in Suriname. Manuscript voor de Medische Zending van Suriname (ADB 81-06-459). 35 pp.

ANNEX I
TERMS OF REFERENCE FOR THE TRIO EES

STICHTING
AMAZON CONSERVATION TEAM SURINAME

TERMS OF REFERENCE FOR
ETHONOLOGICAL SURVEY
IN TRIO LANDS IN SURINAME

Project background and objectives

The Purpose of ACT Suriname is to work in partnership with indigenous people in conserving biodiversity, health and culture in the North-West Amazon including Colombia, Brazil and Suriname. ACT-Suriname works with the indigenous communities in making inventories and plans for their lands, land use and management.

Consulting assignment

The consultant will carry out a survey and assess the social context of the Trio communities in Suriname. The assessment shall be performed in full collaboration with the indigenous and maroon communities, the Government of Suriname, various NGOs and consultants that are active in land management and land acquisition.

The assessment will be an integral part of an ethnoecological survey (see annex for table of contents) should be organized as follows:

- Describe the background of the indigenous peoples living in the Trio lands, including but not limited to the language, ethnology, demography, settlements, spatial occupation, demography, inter-tribal and inter-community relationships, history of the occupation and history of contact.

- Describe of the social, environmental and political conditions around (outside) the demarcated areas in the complex, including development project, social and political conditions and history of prior research in the area.

- Describe natural resources distribution, exploitation and ownership of the Trio peoples in Suriname, including ecological understanding and traditional knowledge,

gender issues, spiritual/ritual associations and management of land and natural resources.

- Describe potential markets in the area, inlcuding the influence from outsiders, adaption and change patterns, threats and problems and priorities, aspirationas and contraints.

Reporting
The Consultant is expected to make contact with the ACT Program Director on a biweekly basis. All reports and deliverables are to be submitted to the ACT Suriname Program Director. The consultant will report in accordance with the following time schedule:

- within 3 month after signing of the contract submission of the draft report.
- within 4 months after signing the contract submission of the final report.

Supervision
The responsibilities detailed herein will be conducted under the under technical direction of the ACT Program Director and in collaboration with ACT field staff. The consultant will be responsible for providing timely quality input to the assignment. The consultant will work collaboratively with other consultants if needed.

Deliverables
Results of the assignment should be summarized in a report (maximum of 40 pages) presented in a format that is understood by non-specialists. Reports will be submitted in English in Microsoft Windows in the following format: all text should be in Normal style, Times New Roman 11. All references should be included, also the names and persons consulted.

Qualifications:
University degree (Msc.) in Antropology/ Social sciences.
Minimum 3 years experience working with indigenous communities in Suriname
Fluent Dutch, Sranan Tongo, English and preferably local languages.
Excellent verbal and written communication skills.
Familiarity with ACT projects, activities, procedures and management personnel;

ANNEX II.
PEOPLE AND INSTITUTIONS INVOLVED IN THE TRIO EES

Nr.	Name	Position/Role	Contact
1	NV BHP Billiton Maatschappij Suriname (BMS)	Client and funder	Tel: (Andy Witcomb) Email: Andy.Witcomb@bhpbilliton.com
2	Organization of American States	Funder	
3	TALAWA (Organization of Trio and Wayana peoples)	Consultant	Kapitein Ewka, chair Tel : +597 8949038 (Paramaribo) Radio frequency: 6.83300 (MZ, Sipaliwini)
4	Amazon Conservation Team Suriname	Client Financial and logistic support	Nickeriestraat 4, Paramaribo Tel: +597-41264 / 401268
5	Marieke Heemskerk	Project coordinator; Senior social science expert	Tel: +597-8910049 E-mail: mheemskerk@yahoo.com
6	Katia Delvoye	Senior environmental expert	Tel: E-mail: kadie@cq-link.sr
7	Monique Pierau	Social science assistant	
8	Mr. Deeko	Tree expert	Division of Nature Management, Ministry of Natural resources.
9	Feikje, Brian, Seini, Andre,	Trio survey assistants in Kwamalasamutu	Kwamalasamutu
10		Trio survey assistants in Tëpu	Tëpu
11	Winni, Sakare(?)	Trio survey assistants in Sipaliwini	Sipaliwini
12	Trio translators and guides in the various smaller Trio villages		

ANNEX III A
SURVEY FORMS: VILLAGE SURVEY

Naam dorp:	**Rivier:**
Dorps ID nr:	**District:**

A. Algemeen

1. Aantal inwoners:
2. Aantal huishoudens:
3. Year village was established:

B. Natuurlijk Kapitaal

1. Hoe komen mensen aan water om te drinken?

☐ Rivier
☐ Kreek
☐ Pomp (grondwater)
☐ Gemeenschapelijke (dorps)kraan
☐ Kraan in huis
☐ Anders, namelijk:

2. Kwaliteit van het drinkwater is:

☐ Zeer slecht - ondrinkbaar
☐ Slecht
☐ Redelijk
☐ Goed

3. Ligt het dorp vlakbij een national park of beschermd gebied?

☐ Dorp ligt in een national park/beschermd gebied
☐ Dorp grenst aan een national park/beschermd gebied
☐ 1-10 km afstand (Minder dan een uur varen)
☐ 11-50 km afstand (Minder dan een dag varen)
☐ Meer dan 50 km afstand (Meer dan een dag varen)

4. Korte beschrijving van de gemeenschaps regels voor het verkrijgen van grond (bv om goud te winnen, om een huis te bouwen, om te planten) en natuurlijke hulpbronnen (busimeti, planten, vruchten, vis, enz):

C. Sociaal Kapitaal:

1. Aantal en soort dorps organisaties:

Soort	Aantal	Naam / Namen
☐ Vrouwenorganisatie		
☐ Jeugdclub		
☐ Sportclub		
☐ Stichting voor dorpsontwikkeling		
☐ Informele spaar- en kredietgroepen (kas-moni)		

2. Beschrijf het aantal een soort openbare ruimtes/gemeenschapsruimtes, bv om te vergaderen:

3. Beschrijf het aantal een soort privé gemeenschapscentra, zoals een videohuis of een bar:

4. Soort van dorps leiderschap

☐ verkozen ☐ aangewezen
☐ erfelijk ☐ anders, n.l.:

5. Traditionele gezagsdragers in het dorp

	Aantal Mannen	Aantal vrouwen	Rol/Taak
☐ Granman			
☐ Kapitein			
☐ Basia			

6. Aanwezigheid vertegenwoordigers van de nationale overheid

	Aantal Mannen	Aantal vrouwen	Rol/Taak
☐ BO			
☐			
☐			

7 Manier van besluitvorming tijdens dorps vergaderingen (krutu's).

☐ consensus; ☐ democratisch; ☐ autoritair; ☐ anders

8. Afstand naar de dichtbijzijnste politiepost

☐ Politiepost in het dorp
☐ 1-10 km afstand (Minder dan een uur varen)
☐ 11-50 km afstand (Minder dan een dag varen)
☐ Meer dan 50 km afstand (Meer dan een dag varen)

9. Aantal misdrijven (bv roofmoord) die iemand hebben verwond of gedood over het afgelopen jaar (Aantal en soort):

10. Aantal misdrijven (bv diefstal, inbraak) zonder persoonlijk letsel over het afgelopen jaar

11. Wat doet men als iemand in het dorp een diefstal heeft geleegd?

☐ Aangeven bij de politie
☐ Oplossen door traditioneel gezag
☐ Oplossen in de privé-sfeer (thuis)
☐ Anders, nl

12. Wat doet men als iemand in het dorp een serieuze misdaad heeft begaan, bijvoorbeeld moord?

☐ Aangeven bij de politie
☐ Oplossen door traditioneel gezag
☐ Oplossen in de privé-sfeer (thuis)
☐ Anders, nl

13. Beschrijf de relatie tussen de traditionele leiders en de vertegenwoordigers van de nationale overheid

14. Aanwezigheid van commercieel sexwerk in het dorp, aangeboden/gevraagd door dorpelngen of mensen van buitenaf. Beschrijf.

D. Financiëel Kapitaal

1. Cash inkomen. Hoe komen mensen in het dorp aan geld?

Activiteit	Niemand doet het	Weinig mensen (Hoeveel?)	Veel mensen (Hoeveel?)
a. Verkoop sieraden			
b. Verkoop zoogdieren, b.v. apen			
c. Verkoop vogels			
d. Verkoop reptielen			
e. Toerisme			
f. Vaste loondienst van ACT			
g. Vaste loondienst bij andere organisatie in het dorp, nl:			
h. Klusjes in het dorp (bv bouw)			
i. Werk in ander dorp, nl.			
j. Werk in Paramaribo			
k. Goudwinning			
l. Overheidsbaan, bv kapitein			
m. Overheidsuitkering, bv AOV			

2. Investering door donoren organisaties over het afgelopen jaar.

Organisatie (bv UNDP, CDFS)	Project	Bedrag

E. Menselijk Kapitaal

Afstand tot:	a. In kilometers	b. In reistijd (vervoersmiddel)
1. Dichtbijzijnste lagere school		
2. Dichtbijzijnste MULO school of ander vervolg onderwijs		
3. Dichtbijzijnste Medizebs kliniek		
4. Dichtbijzijnste ACT kliniek		

5. Mogelijkheid van beroeps (praktijk)training in het dorp.
☐ Nee
☐ Ja; beschrijf :

6. Aantal gezondheidsmedewerkers in het dorp (artsen en verplegers/sters):

7. Aantal traditionele genezers:

8 Belanrijkste doodsorzaken in het dorp, Noem de oorzaak van de meeste sterftegevallen eerst.

9. Kindersterfte: Aantal kinderen jonger dan vijf jaar dat is overleden in de afgelopen drie jaar.

Vragen voor het hoofd van de school of lereressen:

10. Aantal leraren op de lagere school

11. Aantal leslokalen

12. Percentage of deel van de kinderen in de leeftijd 6-12 die naar school gaan.

a. Jongens

- ☐ Allemaal
- ☐ Meer dan 90% (Bijna allemaal)
- ☐ Ongeveer ¾ (75%)
- ☐ Meer dan de helft
- ☐ Ongeveer ¼
- ☐ Minder dan 10% (1/10)
- ☐ Niemand

b. Meisjes

- ☐ Allemaal
- ☐ Meer dan 90% (Bijna allemaal)
- ☐ Ongeveer ¾ (75%)
- ☐ Meer dan de helft
- ☐ Ongeveer ¼
- ☐ Minder dan 10% (1/10)
- ☐ Niemand

18. Percentage of deel v.d kinderen die in de eerste klas beginnen die de lagere school afmaken

a. Jongens

- ☐ Allemaal
- ☐ Meer dan 90% (Bijna allemaal)
- ☐ Ongeveer ¾ (75%)
- ☐ Meer dan de helft
- ☐ Ongeveer ¼
- ☐ Minder dan 10% (1/10)
- ☐ Niemand

b. Meisjes

- ☐ Allemaal
- ☐ Meer dan 90% (Bijna allemaal)
- ☐ Ongeveer ¾ (75%)
- ☐ Meer dan de helft
- ☐ Ongeveer ¼
- ☐ Minder dan 10% (1/10)
- ☐ Niemand

19. Belangrijkste redenen voor drop-out (=het niet afmaken van de lagere school) voor:

a. jongens:

b. meisjes:

20. Beschrijf de kwaliteit van het onderwijs. Bijvoorbeeld, hoe ziet het schoolgebouw eruit, zijn er genoeg stoelen en talfels voor alle leerlingen, zijn er genoeg boeken, schriften, en potloden om mee te werken? Hebben de leraren een lerarenopleiding gevolgd?

21. Voornaamse problemen wat betreft het onderwijs in het dorp

Vragen voor gezondheidswerker(s):

22. Aantal mensen in het dorp die de afgelopen vijf jaar zijn overleden aan HIV/AIDS:

23. Aantal dorpsbewoners dat HIV positief is:

24. Algemene indruk van HIV/AIDS bewustzijn onder de bevolking?

25. Belangrijkste bedreigingen van de gezondheid van dorpsbewoners.

26. Hoe herkent men ondervoeding? B.v. gezwollen buikjes, gelige huid, etc.

27. Aantal kinderen in het dorp dat tekenen van ondervoeding vertoont:
☐ Geen enkel kind
☐ 1-3 kinderen
☐ 4-10 kinderen
☐ Meer dan 10, namelijk:

F. Fysiek Kapitaal

1. Aantal huizen, bewoonbaar:
2. Aantal huizen, totaal:
3. Aantal winkels:
4. Toersime faciliteiten, e.g. lodges:
5. Aantal overheidsgebouwen (specificeer):
6. Aantal gebouwen van individuen of organisaties van buiten het dorp:

7. Is het dorp bereikbaar over de weg? ☐ Nee
☐ Ja, over een G verharde (asfalt) weg G zandweg

5. Wat kost het om het dorp te bereiken vanuit de stad?

Transport middel	*Duur in uur:minuten*	*Kosten in geld (SRD)*
a. Vliegtuig		
b. Boot		
c. Anders, nl:		

6. Aanwezigheid van postdiensten (Surpost),
☐ Geen ☐ Slechte kwaliteit ☐ Goed

7. Riolerings systeem; wat gebeurt er met ontlasting? Kruis alle antwoorden aan die van toepassing zijn.
☐ In het bos
☐ In de rivier
☐ Gemeenschappelijke WC-huisjes
☐ WC-huisjes op het erf bij het huis
☐ WC binnenshuis
☐ Anders, namelijk

8. Vuilverwerking; hoe gaat men om met huisvuil en ander afval? Kruis alle antwoorden aan die van toepassing zijn.
☐ Gooien in het bos
☐ Gooien in de rivier
☐ Afvalhoop buiten het dorp
☐ Afvalhoop binnen het dorp
☐ Begraven
☐ Verbranden

9. Toegang tot electriciteit
☐ EBS aansluiting
☐ Dorpsgenerator
☐ Gemeenschappelijke zonnepanelen
☐ Waterkrachtcentrale
☐ Prive generators
☐ Prive zonnepanelen

10. (Tele)communicatie netwerk
☐ Geen; ☐ cel; ☐ vaste lijn; ☐ radio

11. Aanwezigheid en ontvangst van televisie stations

☐ Geen, ☐ Ontvangst nationale zender, ☐ Ontvangst Braziliaanse zender (sateliet)

12. Aanwezigheid van sport en ontspanningsfaciliteiten voor de jeugd, bv. Voetbalveld, jeugdclubhuis

13. Hoe geschiedt de uitbetaling van uitkeringen, bv voor on- en minvermogenden en AOV?
☐ Uitkeringen worden niet betaald
☐ Uitkeringen worden gestort op een rekening in de stad
☐ Uitkeringen worden in het dorp betaald ..... keer per jaar

ANNEX III B
SURVEY FORMS: HOUSEHOLD SURVEY

In te vullen door onderzoekscoordinator:		
Dorp:	Dorps ID:	
Huishoud ID:	Datum:	Paraaf controle:

A. PAKORO - *HUIS*

1. Pakoro ipëri (*dak*). □ maraja (*tassi*); □ sinki pakoro (*zink*); □ wewe (*hout*); □ akoro tïwëren (*anders*): ....

2. Ëre tato pisi (*vloer*). □ samu (*zand*); □sima (*cement*); □ wewe (*hout*); □ akoro tïwëren (*anders*):.....

3. Pakoro apurto (*buitenmuur*). □ pakoro tantëita (*geen muur*); □ wewe (*hout*); □ wapu (*podosiri bast*)
□ sima (*cement*) □ akoro tïwëren (*anders*)

4. Pokoro turi vije? *(Heeft het huis electriciteit?)* □ Owa (*nee*); □ Aha, pakoro turi montoro (*prive generator)*;
□ Aha, pata turi montoro (*dorps generator*) □ akoro tïwëren (*anders*): .....

5. Pokoro tuna vije? (*Is het huis aangesloten op een watersysteem?*) □ Owa (*nee*); □ Aha (*ja*)

6. Pakoro nai watë enï vije? (*Heeft het huis een toilet?*) □ Owa (*nee*); □ Aha, awaintao (*ja, buitenshuis*)
□ Aha, awe (*ja, binnenshuis*)

7. Ahtarë kamara? (*Hoeveel kamers?*) .....

B. PERSOONLIJKE DATA MAN EN VROUW – INFORMASIE KÏRÏ MA WËRI

		Kërë (*Man*)	Wëri (*Vrouw*)
1	*Persoon ID (in te vullen door onderzoeks coördinator)*		
2	Akë eeka (*Naam*)		
3	Akë jana ëmë? (*Ethnische groep; volk*)		
4	Ampo ënotoponpe? (*Waar ben je geboren - dorp?*)		
5	Ahtarë kapohta ëmë sempo? (*Hoe lang woon je al hier?*)		
6	Ahtarë ëmunkëton? (*Hoeveel kinderen heb je gehad?*)		
7	Ahtarë ëmunkëton wakïne 1-me iwetome? *(Hoeveel kinderen zijn overleden voordat ze 1 zijn geworden?)*		
8.	Ahtarë ëmunkëton wakïne 5-me iwetome? *(Hoeveel kinderen zijn overleden voordat ze 5 zijn geworden?)*		
9	Atï ërantato tëmuje meine (*Leeftijd tijdens geboorte 1^{e} kind*)		
10	Akë mama jomi (*Moedertaal*)		
11	Sranan jomi awarë? (*Spreek je Sranantongo?*)		
12	Oransi jomi awarë? (*Spreek je Nederlands?*)		
13	Mejatën ma mimenutën marë Tarëno jomi tae? (*Kun je lezen en schrijven in het Trio?*)		
14	Mejatën ma mimenutën marë Oransi jomi tae? (“ “ “ *in het Nederlands?*)		
15	Atï ëkampakoro eeka? (*Religie of geloofsovertuiging*) 1=Baptist, 2=RK, 3=EBG, 4=Traditioneel culturu, 5=anders		

C. AKïJAN NAI SËRË PAKOROTAO? (WIE WONEN ER IN HET HUIS?)

Nr	Eeka (*Naam*)	Ahtalë irantato (*leeftijd*)	Kïrï ma wëri? (*Geslacht*)	Atï ëjorokome? Eke ëkarakuri mïrïjan? (*Werk; Hoe verdien je geld?*)	Atï klas ponaren sikoro meine? (*Scholing; hoogste klas*)
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Akï ërepentën? (*Aantal personen in het huishouden dat in vaste loondienst is*):

Ahtarë muretiton tëewa sikorotao 6 jaar ma 12 jaar manton? (*Aantal kinderen tussen de 6 en 12 jaar oud dat niet naar school gaat):*

Ahtarë muretiton nïtën sikorotao 4 jr ma 16 jr manton fotopo? (*Aantal kinderen tussen de 4 en 16 jr dat in de stad naar school gaat*):

D. REIZEN NAAR DE STAD

1. Kïrï atërëjarï ponarënen mëtënne fotopona? _____

Hoe vaak is het mannelijk hoofd van huishouden in het afgelopen jaar naar de stad gereisd?

2. Ahtarë karakuri weiwararë tïkërë tënesse ija? _____

Hoeveel geld heeft hij op elk van die trips meegenomen?

3. Wëri atërëjarï ponarënen mëtënne fotopona? _____

Hoe vaak is het vrouwelijk hoofd van huishouden in het afgelopen jaar naar de stad gereisd?

4. Ahtarë karakuri weiwararë tëkërë tënesse ija? _____

Hoeveel geld heeft zij op elk van die trips meegenomen?

F. RIJKDOM

Ahtarë wïtototon iwenje mënparë pakorotao? Inkoetoentëe wa ehë irïpïton mënparë.
Hoeveel van de volgende spullen zijn er in het huis? Tel geen kapotte spullen.

	Hoeveel ? *Ahtarë ?*		Hoeveel ? *Ahtarë ?*
1. Kurairo (*Kip*)		7. Tuna enï sikiman (*Durotank*)	
2. Radio (*Radio*)		8. Turi montooroe (*Generator*)	
3. TV (*Televisie*)		9. DVD (*DVD speler*)	
4. Ijskast (*Koelkast*)		10. Tërën tërën man (*Kruiwagen*)	
5. Kanawa *(Boot*)		11. Saag *(Stihlzaag*)	
6. Montooroe (*Buitenboort motor*)		12. Telefoon (*Mobiel*)	

G. ZIEKTE

Ahtarë wïtototon ësenë kënei tweewikinpë ahtao? Wie in het huishouden zijn er in de afgelopen week ziek geweest?

Eeka Naam	*Ësenë* Ziekte	*Ahtarë wei ësenë* Dagen ziek	*Ahtarë wei kama tao?* Dagen in bed.	*Ahtï mërë ne ësenë ëmë ahtao?* Behandeling	*Itu ëpi ke mëe pinëne* Busidresi?

H. DORPS-ORGANISATIES (CBO'S)

Wïtototon karë sempo Stichting dïneme? Is iemand in het huis lid van een dorpsorganisatie of een stichting (bv vrouwengroep)?

	Eeka- *Naam*	Eeka Stichting/Ekano Stichting - *Naam/soort organisatie*
1		
2		

I. VOEDING - ËREPA

1. Ahtarë wei arïsi mëëjan?		1-me		2-me	3-me	Monome
Aantal rijstmaaltijden per dag:		*1*		*2*	*3*	*meer dan 3*
2. Ahtarë wei wïï mëejan?		1-me		2-me	3-me	Monome
Aantal maaltijden met casave per dag:		*1*		*2*	*3*	*meer dan 3*
3. Ahtarë wiki mënën kana?	Piasarëken		eenwiki wëjae twee ponare	Tahen 3 tahen 5		Wei wararë
Aantal maaltijden per week met vis	*Minder dan 1*		*1-2*	*3-5*		*Elke dag*
4. Ahtarë wiki mënën tënëin?)	Piasarëken		eenwiki wëjae twee ponare	Tahen 3 tahen 5		Wei wararë
Aantal maaltijden per week met busmeti	*Minder dan 1*		*1-2*	*3-5*		*Elke dag*
5. Ahtarë wiki mënën sardien?	Piasarëken		eenwiki wëjae twee ponare	Tahen 3 tahen 5		Wei wararë
Aantal maaltijden per week met sardines	*Minder dan 1*		*1-2*	*3-5*		*Elke dag*

6. Ahtarë wei moenëpë tao ëewe sewarën meine? *Hoeveel dagen in de afgelopen maand heeft het gezin helemaal niets gegeten?:*

J. COMMUNICATIE NETWERKEN

Ahtarë meta tiponesenton tïwërengpein?
Hoe vaak krijgen de leden van het gezin informatie of nieuws van de volgende bronnen?

1. Krant - *Karanti* ☐ Wei wararë - *Dagelijks* ☐ Wiki wararë - *Elke week* ☐ Nunë wararë - *Elke maand* ☐ Iranta wararë - *Paar maal per jaar* ☐ Owarënken - *Nooit*	**2. Nationaal radio station, bv. Apinti - *Eseresi*** ☐ Wei wararë - *Dagelijks* ☐ Wiki wararë - *Elke week* ☐ Nunë wararë - *Elke maand* ☐ Iranta wararë - *Paar maal per jaar* ☐ Owarënken - *Nooit*
3. Dorpsradio zender - *Radio wëturuto* ☐ Wei wararë - *Dagelijks* ☐ Wiki wararë - *Elke week* ☐ Nunë wararë - *Elke maand* ☐ Iranta wararë - *Paar maal per jaar* ☐ Owarënken - *Nooit*	**4. TV nieuws** ☐ Wei wararë - *Dagelijks* ☐ Wiki wararë - *Elke week* ☐ Nunë wararë - *Elke maand* ☐ Iranta wararë - *Paar maal per jaar* ☐ Owarënken - *Nooit*

K. BILLITON MIJN

1. Metane ahtï na tamirën nonopë Surinamepo. Akï këmpono ëja?

Heeft u gehoord over de mogelijke aanleg van een bauxietmijn in West Suriname? En zo ja, van wie?

☐ Nee - *Owa*
☐ Billiton/SRK
☐ Traditioneel gezag – *Pata entuton inenephë*
☐ Van andere mensen uit het dorp – *Tïwërën wïtototon pataponton*
☐ Trio van buiten het dorp die op bezoek komen - *Tïwërënpeïn tarënoton*
☐ Anders, namelijk - *Tïwërën.*.....

2. Mïtënne pena pïpona Bakhuys inkae? - *Bent u wel eens in het Bakhuys gebied geweest? En zo ja, waarom?*

☐ Owa -*Nee*
☐ *Aha, wëiwatome* - Ja om te jagen
☐ Aha, kanatonematome - *Ja om te vissen*
☐ *Aha, tïpatoro wïtëtome tïwerën patapona*-Ja op doortocht naar andere plaatsen
☐ Andere reden - *Tïwërën.*.....

3. Eke mipunëjan serë pata iwe panamato tahen tamiren nono nejan ahtao?

Hoeveel invloed denkt u dat deze mij op het dorp zal hebben?

☐ Epanamaewa nejan - *Geen enkele invloed*
☐ Irëpëmenetan - *Negatieve invloed*
☐ Kurënetan - *Positieve invloed*
☐ Wame - *Weet niet*

4. Ekano irëpë atënaton netan? *Wat voor negatieve gevolgen denkt u dat een mijn kan hebben?*

5. Ikano kurënoton netan ? *Welke positieve gevolgen kan de bouw van de mijn hebben voor u, uw familie, of het dorp?*

J. Einde, dank-je-wel: Naka, napofa.

Annex IV: Hydrology: Water quality, survey results

Trio village	**Sandlanding**	**Wanapan**	**Amatopo**	**Kuruni**	**Sipaliwini**
Surveyed nearby river	Corantijn	Corantijn	Corantijn	Kuruni	Sipaliwini
Date	04/31/07	04/29/07	07/27/07	07/29/07	05/29/07
Water temperature (ºC)	29	28	28	28	26
Turbidity (JTU)	0	0	0	0-5	10-15
pH	8-9	8	8	8	8
Dissolved oxygen (saturation % DO) *	91	102	102	13	99
NO_3 (ppm)	0	0	0	0	0
PO_4 (ppm)	0-1	0-1	2	2	2
Total coliform bacteria (positive result = more than 20 total coliform colonies per 100 ml)	positive	positive	positive	positive	positive

* Calculations are based on solubility of oxygen in water at sea level, from Standard Methods for the Examination of Water & Wastewater, 18th edition.

ANNEX V: WILD PLANTS USED BY THE TRIO

Based on Teunissen and Noordam, 2003

CONTRUCTION MATERIALS FOR SHELTERS, CAMPS AND HOUSES (Tr:pakolo)

Scientific name	English name	Dutch name	Sur-Ned (SN) / Sranan Tongo (ST) name	Wayana name	*Trio name*	Part of plant /use
CONSTRUCTION WOOD						
Vouacapoua americana (Caesalp.)			bruinhart	wakap	wakapu	wood as posts of houses
Dicorynia guianensis (Ceaslp.)			basralokus	?	?	wood
Vochysia tomentosa			wanakwari	wanakwari	?	wood
Couratari spp			ingipipa	ingipipa	?	wood
Goupia glabra (Goupiac.)			kopi	warima	pasisi	wood
Nectandra & Ocotea spp. (Laur.)			pisi	apisi	wai	wood
Eperua falcata (Caesalp.)			walaba	wapa	totopo	wood
Carapa spec. (Meliac.)			krapa	krapa	karapa	wood
Licania micrantha (Chrys.)			zwarte fungu			wood as roof support
Xylopia nitida (Annon.)			witte pedreku			
Croton spec. (Euph.)			langbladige tabakabron			
Jacaranda copaia (Bign.)			gubaya		kunatepi	
Eschweilera sp. (Lecyth.)			umabarklak manbarklak	kuput	anjamaraiwa watala	as roof supports
FLOORS AND WALLS						
Euterpe oleracea (Palmae)			pina	apu	wapu	split stems (floors, walls)
Iriartea exorrhiza (Palmae)			ingiprasara	pëpë	piura	split stems (floors, walls)
Bambusa vulgaris (Gram.)	bamboo	bamboe	bambusi	kurumuri	paara	split stems (walls)
Ischnosiphon spp. (Marant.)			warimbo	wama	waruma	split stems (woven walls)
Geonoma baculifera (Palmae)			taspalm	mararia	maraja	leaves
ROOFING THATCH						
Astrocaryum sciophilum (Palmae)			bugrumaka	inumu	muru	leaves

Attalea regia (Palmae)			maripa	maripa	maripa	leaves

FURNITURE AND HOUSEHOLD UTENSILS

Scientific name	English	Dutch	Sur-Ned/ Sranan	Wayana	Trio	Part of plant / use
WOVEN UTENSILS: MANIOC PRESSES (MATAPI), SIEVES (MANARI), FANS, STORAGE BOXES (PAGARA), BASKETS, CARRIER BASKET (KATARI) etc.						
Ischnosiphon spp. (Marant.)			warimbo	wama	waruma	split stem
Astrocaryum (Palmae)			bugrumaka	mumu	muru	(wide yellow) strips from young leaf slips
Gynerium sagittatum (Gram.)			pijlriet, peri	purow	pureowime	culm of inflorecense
Annona spec. (Annon.)			kapuweri boszuurzak	?	waruma	bark
Couratari spp. (Lecyth.)			ingipipa	katari	bono, tirenen	bark
Eschweilera spec. (Lecyth.)			barklak	katari ewa	watala	bark
Mouriria spec. (Humir.)			spikri-udu		mirimiri	wood for frames
Rinorea spec. (Viol.)			manaritiki	manare epu	?	wood for frames
HAMMOCKS						
Gossypium barbadense (Malv.)	cotton tree	katoen	katun	mawu	maru entu	cotton from seeds
Mauritia flexuosa (Palmae)			morisi	kuwai	koi	strips from leaf slips, not used at Apetina

Scientific name	English	Dutch	Sur-Ned/ Sranan	Wayana	Trio	Part of plant / use
JARS, CONTAINERS						
Crescentia cujete (Bign.)	calabash	kalebas	krabasi	karapi	kamo	pericarp
Lagenaria siceraria (Cucurb.)	gourd	fles-kalebas	ingigodo	tutpë	atoreïme	pericarp
Attalea maripa (Palmae)			maripa	maripa	maripa	spathe of inflorescence used as tray
Bambusa vulgaris (Gram.)	bamboo	bamboe	bambusi	kurumuri	paara	culm: container for poisenous arrow-heads
POTTERY						
Licania spp. (Chrys.)			kwepi	apurukun	kuwepi	charcoal from bark to mix with clay
Protium aracouchini (Burs.)			kumete	?	?	ingredient for paint to which colors should be added
Inga spec. (Mimos.)			rode prokoni	sikë	?	bark to produce red paint
BROOMS AND BRUSHES						
Bambusa vulgaris (Gram.)	bamboo	bamboe	bambusi	kurumuri	paara	split culm
Euterpe oleracea (Palmae)			pina	apu	wapu	infloresence
Attalea regia (Palmae)			maripa	maripa	maripa	leave veines, split leaf stalk
Oenocarpus bacaba (Palmae)			kumbu	airiki	kumu	leave veines, split leaf stalk

FIBERS AND TWINING MATERIALS

Scientific name	English	Dutch	Sur-Ned / Sranan	Wayana	Trio	Part of plant / use
FIBERS AND TWINING MATERIALS						
Gossypium barbadense (Malv.)	cotton tree	katoen	katun	mawu	maru entu	cotton from seeds
Bromelia alta (Brom.)			singrasi	kuraiwat	wirawaito	fibers of leaves
Agave sisalana	American Aloe	agave		mami	ajawari	fibers of leaves
Mauritia flexuosa (Palmae)			morisi	kuwai	koi	rope from leave slips
Carludovica sarmentosa (Cycl.)			mankamina	mami	nopojame	aerial roots
Stigmaphyllon convolvulifolium (Malp.)			konkoni-kasaba	?	matukru	liana
Cucurbitaceae spec.				?	kumikumi	liana
Bagassa guianensis (Morac.)			bagase	?	pakasa	bark (to carry babies)
Heteropsis jenmanii (Arac.)			kaminatetei	mami	ajaaware	aerial roots
Philodendron grandiflora (Arac.)			tayatetei	?	sintime	aerial roots
Philodendron spec. (Arac.)			makatetei	?	ukana	aerial roots
Araceae spec. (Arac.)			sparitaya	?	wukana	aerial roots

RESINS, RUBBER AND NON-COOKING OILS

Scientific name	English	Dutch	Sur-Ned / Sranan	Wayana	Trio	Part of plant / use
RESINS, RUBBER, NON-COOKING OILS						
Hymenaea courbaril (Caesalp.)			lokus, loksi	mepu	kauru	resin from bark, to lit fire
Protium spp. (Burser.)			ajawa-tingimoni, busikandra	awa	awa	resin from bark, for lightening
Symphonia globulifera (Clus.)			mataki	prakta	mani	resin from bark= tar for ropes
Hevea spec. (Euph.)	rubber tree	rubber-boom		?	awee	rubber from bark to remove mosquito-worms (botflies)
Manilkara bidentata (Sapot.)	bullet tree		boletri	ekupima	parahtara	balata (palata) also used as glue
Bagassa guianensis (Mor.)			kawudu	ekupima	pakasa	false balata to fill leaks in boats
Copaifera guianensis (Caesalp.)			hoepelhout	kupaiwa	kopaiwa	wood oil, also used as insecticide
Macoubea guianensis (Apoc.)			sokosokomapa	?	?	to catch birds
Apocynaceae spec. 1			tarabon	?	haipukwime	to catch birds
Apocynaceae spec. 2			taratetei	were		to catch birds

CONSTRUCTION WOOD FOR CANOES

Scientific name	English	Dutch	Sur-Ned / Sranan	Wayana	Trio	Part of plant / use
CANOES (TR: kanawa) & PEDDLES						
Bagassa guianensis (Morac.)			kawudu	ekupima	pakasa	wood for boat constuction
Brosimum spec. (Morac.)			dukali-species	?	pïï	wood for boat constuction
Vochysia tomentosa (Voch.)			wanakwari	?	etekërë	wood for boat constuction
Nectandra & Ocotea spp. (Laur.)			pisi	apisi	wai	wood for boat constuction
Sloanea spp. ((Eleocarp.)			rafrunyanyan	?	tephaima	wood for boat constuction
Swartzia spp. (Papil.)			bugubugu	?	kwikwiweti	wood for peddles
Aspidosperma spec. (Apoc.)			pari-udu, parelhout	eparai	?	wood for peddles
			kopi	?	pasisi	boot construction

HUNTING & FISHING UTENSILS AND WEAPONS

Scientific name	English	Dutch	Sur-Ned / Sranan	Wayana	Trio	Part of plant / use
BOW[37]						
Piratinera spp. (Morac.)		letter-hout		paida?	urapawewe	wood
Brosimum rubescens (Morac.)		satijn-hout	saten-udu	?	ulaba	wood
ARROW SHAFTS[38]						
Gynerium sagittatum (Gram.)			pijlriet, peri	purow/pilëui me	puleowime	culm of inflorecense
Bambusa sp. (Gram.)	bamboo	bamboe	bambusi	kurumuri	paara	culms: heads for larger mammals
Aulomyrcia hostmanniana (Myrt.)			rode bast bosgujave	?	sorosoro-idipa	wood: heads for larger birds
Mouriria spec. (Hum.)			spikri-udu	?	mirimiri	wood: heads for larger birds
Attalea maripa (Palmae)			maripa	maripa	maripa	leaf stalk: heads for smaller mammals
Rinorea spec. (Viol.)			leletiki	kamara	kurunje	wood: heads for smaller birds

Araceae spec. to train hunting dogs
Bark of Spondias mombin to lure aguti

[37] Bows and arrow-head containers may be decorated with bird feathers. See Annex VI.
[38] Hunting arrow (not for fishing) are provided with bird feathers. See Annex VI

Scientific name	English	Dutch	Sur-Ned / Sranan	Wayana	Trio	Part of plant / use
ARROW POISON						
Strychnos guyanensis (Logan.)	curare	curare		urari	urare	root bark
Strychnos medeola (Logan.)	curare	curare		?	urare	substitute for Strychnos guianensis
Piper bartlingianum (Piper.)				?	mamewiranu	poison ingredient
Piper poiteanum (Piper.)				arakupani	arakupane	poison ingredient
Piper aff. alatabaccum (Piper.)				?	ademeputupu	poison ingredient
Piper spec.				petpë		poison ingredient
Capsicum annuum. (Solan.)			rode peper	asi	kunebebe	poison ingredient
Rapatea paludosa (Rapat.)				?	towtow	poison ingredient
Endlicheria bracteolata (Laur.)				?	wi	poison ingredient
Ocotea guianensis (Laur.)				?	wi	poison ingredient
cf. Iriartea (Palmae)				?	pehurat	poison ingredient
Philodendron melinonii (Arac.)					wikaw	poison ingredient
FISH TRAP - PAKUSHI						
Iriartea exorrhiza (Palmae)			ingiprasara	pëpë	piura	stems
Heteropsis jenmanni (Arac.)			kaminatetei	mami	ajaaware	aerial roots
FISHING RODS and LINES						
Anaxagorea sp.? (Anon.)			manpikapika	?	mekrowewe	fishing rods are rarely used
Bromelia alta (Brom.)			singrasi	kuraiwat	wirawaito	fibers of leaves

Scientific name	English	Dutch	Sur-Ned / Sranan	Wayana	Trio	Part of plant / use
FISH BAIT[39]						
Mourera fluvialtilis (Podost.)			kumaru-nyanyan	?	pema	flowers
Eugenia patrisii (Myrt.)			sekrepatu kersi	?	pomoime	fruits
Montrichardia arborescens (Arac.)			mokomoko	?	kurukuni	young fruits
Phytolacca rivinoides (Phytol.)			gogomango	pararipan	panarepane	fruits
Cordia tetrandra (Borag.)			tafrabon	mojoi	kaaka	Fruits (for paku)
Clibadium surinamense (Comp.)			kunami	kunani	kunani	fruits
Genipa americana (Rub.)			tapuripa	kurupë	menu	fruits
Jacaranda rhombifolia (Bign.)			morokobita	?	paade	seeds
Eperua spp. (Caesalp.)			walaba	?	totopo	seeds
FISH POISON						
Lonchocarpus spp. (Papil.)			neku-udu	harihari	kunotoke	wood
Lonchocarpus spp. (Papil.)			neku (tetei)	?	ineku	roots

[39] Also raw meat and silver bait fishes are used as fish bait. See annex VI

Tephrosia toxicaria (Papil.)			bumbi	asikuna	asikuna	roots
Clibadium surinamense (Comp.)			kunami	kunani	kunani	leaves
Smilax schomburgkiana (Lil.)				pretauw		
Piratinera spp. (Morac.)			letterhout	?	arapawewe	wood to produce weapon club
Bambusa vulgaris (Gram.)	bamboo	bamboe	bambusi	kurumuri	paara	split stems to make suite of armour

FOOD[40]

Scientific name	English	Dutch	Sur-Ned / Sranan	Wayana	Trio	Part of plant / use
FRUITS						
Euterpe oleracea (Palmae)			pina	apu	wapu	palm heart
Attalea maripa (Palmae)			maripa	maripa	maripa	palm heart
Caryocar glabrum (Caryoc.)			ingi noto	?	cho	nuts
Lecythis davisii (Lecyth.)			kwatapatu	tura	turaran	seeds
Anacardium occidentalis (Anac.)		kasjoe	kasyu	oroi		nuts
Bactris spp. (Palmae)			keskesmaka	?	piritu	seeds
Gnetum nodiflorum (Gnet.)				?	towa	seeds (roasted)
Spondias mombin (Anac.)		mope	mope	?		fruits
Bertholletia excelsa (Lec.)			brazielnoot	**[41]		nuts
COOKING OIL AND FATS						
Bactris oligocarpa (Palmae)			grote awara	?	amana	fruits
Astrocaryum sciophilum (Palmae)			bugrumaka	mumu	muri	fruits
Attalea maripa (Palmae)			maripa	maripa	maripa	fruits
Oenocarpus bacaba (Palmae)			kumbu	airiki	kumu	fruits
DRINKS						
Theobroma cacao (Sterc.)	cacao	cacao	kakaw	arapuru	wereke	seeds (sqeezed)
Oenocarpus bacaba (Palmae)			kumbu	airiki	kumu	fruits
Oenocarpus bataua (Palmae)			patawakumbu	patawa	kumuime	fruits
Euterpe oleracca (Palmae)			pina, podosiri	apu	wapu	berries
Cecropia sciadophylla (Cecr.)			manbospapaya		ume	water within the roots
JUICY FRUIT						
Omphalea diandra (Euph.)			babunnoto	?	warike	pulp (seeds poisonous)

[40] for cultivars and more introduced fruit trees see Annex VIII .
[41] ** not present in Wayana-area

Platonia insignis (Clus.)			pakuli, geelhart	?	kunumima	fruits
Rheedia macrophylla (Clus.)			hoogland pakuli	?	anjumara-ede-toto	fruits
Scientific name	**English**	**Dutch**	**Sur-Ned / Sranan**	**Wayana**	**Trio**	**Part of plant / use**
Eugenia patrisii (Myrt.)			sekrepatukersi	?	pomoime	fruits
Mouriria spp. (Melast.)			spikri-udu	?	mirimiri	fruits
Byrsonima spp (Malp.)			sabanakwari	?	?	fruits
Humiria spec. 1 (Hum.)			langbladige blakaberi	?	makaraima	Fruits (not as sweet as makara)
Humiria spec. 2 (Hum.)			hoogbos blakaberi	?	kara	fruits
Tetragastris spp. (Burser.)			rode sali	?	adita	fruits
Anacardium occidentalis (Anac.)	cashew	kasjoe	rode & gele kasyu	oroi	oroi & oroi ararawa	juicy fruit stalks
Anacardium giganteum (Anac.)			boskasyu	orosimë	itu oroi	juicy fruit stalks
Spondias mombin (Anac.)			mope	maapa	maapa	fruits
Tapirira guianensis (Anac.)			weti-udu, duka, jamaica-siri	?		fruits
Manilkara bidentata (Sapot.)			boletri	?	parahtara	fruits
Pouteria spp. (Sapot.)			dyuboletri	?	tumori	fruits
Ecclinusa cuneifolia (Sapot.)			kwatabobi	tumuri	emori	fruits
Herrannia kanukuensis (Ster.)			busikakaw	?	akanapatoroto toro	fruits
Theobroma spec. (Sterc.)			busikakaw	?	adikanama	fruits
Pouteria guianensis (Sapot.)			Jan Snijder	?	?	fruits

Ambelania acida (Apoc.)			batbat	?	kamagi	fruits
Duroia spec. 1 (Rub.)			marmeldoos	wütuk	menoima	fruits
Duroia spec. 2 (Rub.)			marmeldoos	?	awasana	fruits
Attalea regia (Palmae)			maripa	maripa	maripa	fruits
Mauritia flexuosa (Palmae)			morisi	?	koi	fruits
Bactris gasipaes (Palmae)			paripu	krupoime	paripo	fruits
SWEETS						
Scientific name	**English**	**Dutch**	**Sur-Ned / Sranan**	**Wayana**	**Trio**	**Part of plant**
Inga spec. 1 (Mimos.)			switbonki	?	karutapa	pulp around seeds
Inga spec. 2 (Mimos.)			liba switbonki	?	kiurami	pulp around seeds
Inga spec. 3 (Mimos.)			Brazil switbonki	turi	arimi arokri	pulp around seeds
Theobroma coacao (Buett.)	cacao	cacao	kakaw	arapuru	wereke	pulp around seeds
Hymenaea courbaril (Caesalp.)			rode lokus, loksi	?	kaura, roka	pulp around seeds
SMOKERS' REQUISITES						
Couratari spp (Lecyth.)			ingipipa		pono	bark as sigaret paper
HALLOCYNOGENS						
Helicostylis tomentosa (Morac.)			takini	?	takini	liquid from bark
Brunfelsia guianensis (Solan.)			malasi-udu, man-bitawiwiri	?	kupedeja	bark

FIRE WOOD

Scientific name	**English**	**Dutch**	**Sur-Ned / Sranan**	**Wayana**	**Trio**	**Part of plant**
FIREWOOD						
Elisabetha aff.princeps (Caesalp.)			rode bast	?	kakaimë	wood

			tamarin			
Chrysobalanacaea fam.			kwepi	?		wood
Curatella americana (Dilleniac.)			sabana kasjoe			wood
Laetia procera (Flacourtiac.)			pinto kopi		malu wewe	wood

MEDICINES, POISONS AND REPELLANTS

MEDICINES
For an overview and descriptions of different species of medicinal plants (including trees, palms, lianas, shrubs, herbs incl. ferns, mosses and fungi) used by the TRIO people see: PLOTKIN (1986): *Ethnobotany And Conservation of the Tropical Forest with special reference to the Indians of Southern Suriname.* Thesis Tufts University.

Scientific name	**English**	**Dutch**	**Sur-Ned / Sranan**	**Wayana**	**Trio**	**Part of plant / use**
PESTICIDES AND REPELLANTS						
Lonchocarpus spp. (Papil.)			neku	harihari	ineku	roots as insecticide
Pachyptera alliacea (Bign.)	garlic vine		knofrokotetei	?	akapota	stems to chase away bats
Bombax aquaticum (Bomb.)			watrakakaw	?	mekumpe entu	fruits used to kill sand-fleas
Carapa 2 spp. (Meliac.)			krapa	karapa	karapa	oil from seeds as repellent against ticks
Euphorbia spec. (Euph.)			mirkasaba	?	kunapalu	leafs when eaten kill leaf-cutting ants in gardens

Bixa orellana (Bixac.)	annoto	annoto	kuswe	onot	whise	seed-arillus as insect repellant

BODY CARE, CLOTHING, ADORNMENTS, MUSIC INSTRUMENTS

Scientific name	English	Dutch	Sur-Ned / Sranan	Wayana	Trio	Part of plant
SOAP / SHAMPOO						
Bignoniaceae spec.			liana	?	?	bark with saponine
Furcraea foetida (Amaryll.)			ingisopo	amra	wiwiri	juice of succulent leaves stimulates hair growth
Cedrelinga cateniformis (Mimos.)			donsedre	?	pinjeje	extract of bark as hair shampoo against itch
Attalea speciosa (Palmae)			granmaripa	kuxi	kui	oil from fruit used as hair oil
BODY PAINT[42]						
Bixa orellana (Bixac.)	annoto	annoto	kuswe	onot	whise	fatty arillus as red bodypaint
Genipa americana (Rub.)			tapuripa	kurupë	menu	fruits to produce blue-black body paint
TRIO HAIR COMB[43]						
Bambusa vulgaris (Gram.)	bamboo	bamboe	bambusi	kurumuri	paara	split culm to produce comb teeth
Attalea maripa (Palmae)			maripa	maripa	maripa	split leaf stalk to produce comb teeth
Oenocarpus bacaba (Palmae)			kumbu	airiki	kumu	split leaf stalk to produce comb teeth
Gossypium barbadense (Malv.)	cotton tree	katoen	katun	mawu	maru entu	cotton from seeds
EYE CARE						

[42] Hair and (painted) body often decorated with down feathers of the Harpy Eagle. See Annex VI
[43] Combs include a Spider Monkey bone and is decorated with bird feathers. See Annex VI

Imperata contracta (Gram.)			mosoyo-grasi	?		glumae to depilate eyebrows and beard hairs
Scientific name	**English**	**Dutch**	**Sur-Ned / Sranan**	**Wayana**	**Trio**	**Part of plant / use**
CLOTHING, HEADDRESSES, HAIR TUBES, NECKLACES, ARMLETS[44]						
Didimopanax morototoni (Sterc.)			morototo	?	maramara	(brown) seeds for necklaces and to decorate hair tubes
Guadua spec. (Gram.)	bamboo	bamboe	fluitbamboe	?	sari	culms used as hair tubes
?				?	apurukwi	bark to produce black paint for maramara seeds
?				?	?	idem, for orange paint
Talisia sp. (Sapind.)					taari	extraction of leaves, for deep purple color
?				?	?	for blue paint
Flacoutiaceae spec.				?	?	bark for maroon paint
?			eetbare mispel	?	jakadi	redish purple
Bignoniaceae spec.				?	?	green paint
?				?	?	yellow paint
Mucuna sloani (Papil.)			kawai	?	?	seeds for necklaces
Coix lacrima-jobi (Gram.)			kanefro	sampere	ampere	seeds for necklaces
Tetragastris spp. (Burser.)			sali	?	sawawaima	seeds for necklaces
Phenakospermum guianensis (Musac.)			bigi palulu	?	paru	seeds for necklaces

[44] Headdresses and armlets mainly consist of animal products: feathers of macaws, parrots and tucans, sometimes also of the Harpy Eagle. Necklaces are often decorated with teeth of jaguars, peccaries and/or monkeys. See table Annex VI

Ormosia spp. (Papil.)			kokriki	onokowe	wotow	seeds for necklaces
Cana indica (Can.)	Indian shot	Cana/ indisch bloemriet	sakasiri	?	palakalu	seeds for necklaces

Scientific name	English	Dutch	Sur-Ned / Sranan	Wayana	Trio	Part of plant / use
MUSIC INSTRUMENTS[45]						
Cedrela odorata (Meliac.)			sedre	?	?	wood for drums
Nectandra & Ocotea spp. (Laur.)			pisi	apisi	wai	wood for drums
Guadua sp. (Gram.)		bamboe	bambusi	?	sari	culms for panflutes
Lagenaria siceraria (Cucurb.)	gourd	fles-kalebas	krabasi	tutpë	atoreïme	pericarp for maraka
Canna coccinea (Cannac.)			sakasiri	?	?	seeds are used in the maraka
Thevetia peruviana (Apoc.)			Jorojoro, karwasi	kawai	?	fruits with ripe seeds are used as marakas
Didymopanax morototoni (Sterc.)			morototo	?	maramara	seeds as adornments for maraka: for paints see: necklaces

[45] Drumheads are made from animal skins. See Annex VI

ANNEX VI: WILD ANIMALS FOR NON-COMMERCIAL USE BY THE TRIO

Source: Teunissen and Noordam, 2003

Legend of colors:

Column 1:
blue: game species: hunting allowed, also catching and keeping in cages.
purple: cage species: catching and keeping in cages allowed.
red: harmful species. shooting and catching allowed all year around.
green: protected species, but limited trade allowed.
black: protected species, trade prohibited
brown: not protected reptiles and amphibians.

TABLE a: FOOD

Scientific name	**English**	***Dutch***	**Sur-Ned (SN) / Sranan Tongo (ST)**	**Wayana**	**Trio**
MAMALIA - MAMMALS - ZOOGDIEREN - METI					
ALL PRIMATES (8)					
Chiropotes satanus	black saki	baardsaki	kwataswagri, bisa	isoimë	isoimë
Pithecia pithecia	pale-headed saki	witkopaap	wanaku	kushiri	ariki
Alouatta seniculus	howler monkey	brulaap	babun	arawata/ alawata	arawata
Cebus apella	brown capuchin	bruine capucijner	keskesi, meku	meku	taripi
Cebus olivaceus	tufted capuchin	grijze capucijner	bergikeskesi	wakew	akeu
Saimiri sciureus	squirrel monkey	doodskopaap	monkimonki	kwanan	akarima
Ateles paniscus	spider monkey	zwarte spin-aap, slingeraap	kwata	arimi alimi	arimi
Saguinus midas	red-handed tamarin	roodhand-	saguwenke	makui	makui

		zijdeaapje			
Scientific name	**English**	***Dutch***	**SN / ST**	**Wayana**	**Trio**
MOST EDENTATES (9)					
Myrmecophaga tridactyla	giant anteater	reuze miereneter	tamanwa	walisimë	masiwe
Tamandua longicaudata	lesser anteater	middelste miereneter	mirafroiti	walisimë	marime
Bradypus tridactylus	three-toed sloth	drieteen luiaard	sonloiri	ili	arekore
Choloepus didactylus	two-toed sloth	tweeteen luiaard	skapuloiri	ili	wirinai
Priodontes giganteus	giant armadillo	reuzengordeldier	granman kapasi	moraime	moraime
Euphractus sexcinctus	six-banded armadillo	zesbandig gordeldier	(kapasi)	moaimeime	?
Cabassous unicinctus	broad-banded armadillo	naaktstaart gordeldier	pikin kapasi	kapasi	?
Dasypus kappleri	Kappler's armadillo	Kappler's gordeldier	makakapasi	kapasi	kapaime(n)
Dasypus novemcinctus	nine-banded armadillo	negenbandig gordeldier	lontutere kapasi	kapasi	potepote
CERTAIN CARNIVORES (5)					
Panthera onca	jaguar	jaguar	peni tigri	kakui	timenuren
Nasua nasua	coati	neusbeer	kwaskwasi	seu/sijeu	seu
Potos flavus	kinkajou	rolstaartbeer	netikeskesi	kuikui	kuikui
Gallictis vittata	grison	grison	weti-aira	?	?
Eira barbara	grey-headed weasel	zwartbruine veelvraat	aira	kerepuke	ekerepuke

Scientific name	**English**	***Dutch***	**SN / ST**	**Wayana**	**Trio**

ALL UNGULATES (6)					
Tapirus terrestris	South-American tapir	Z-Am. tapir	bofru	maipuri	pai
Dicotyles pecari	white-lipped peccary	witlip-pekarie	pingo	peneke pëinekë	pëinjekë
Tayassu tajacu	collared peccary	halsband-pekarie	pakira	pakira	pakira
Odocoileus virginianus	white tailed deer	savannehert, strandhert, zeehert	sabanadia	kapaw	wikapau
Mazama americana	large red brocket	groot boshert	prasara-dia, pranasi-dia	kariak kalejak	kajake
Mazama gouazoubira	grey brocket	klein boshert	busikrabita, kuriaku	kariak	kajake
CERTAIN RODENTS (12)					
Sciurus aestuans	Guiana tree-squirrel	Surinaamse eekhoorn	bonboni	meri	meri
Sciurus pusillus	South American pygmee squirrel	kleine Surinaamse eekhoorn	boniboni	meri	sikarakara
Proechymus guyanensis	spiny rat	stekelrat	maka-alata	alu	Munupe-ime
Proechymus spec.	spiny rat	stekelrat	maka-alata	alu	sawa
Mesomys spec.	spiny rat	stekelrat	maka-alata	alu	sawa
Echymis chrysurus	white-crested spiny rat	Surinaamse goudrat		arawime	awarime
Hydrochaeris hydrochaeris	capybara	capibara	kapuwa, waterhaas	kapiwala	iwuri
Dasypocta leporina	orange-rumped aguti	Surinaams konijn, agoeti	konikoni	akuri	akuri
Dasyprocta cristata	?			?	
Myoprocta exilis	reddish acuchi	staart-agoeti	mambula	pasi	pasinure
Agouti paca	paca	Surinaamse haas,paca	haas, he	kurimau kulima	kurimau

Coendoe prehensilis	South-American tree porcupine	boomstekelvarken	gindyamaka	alu *(not eaten by Wayanas)*	mudi

Scientific name	**English**	***Dutch***	**SN / ST**	**Wayana**	**Trio**
ALL TINAMOUS (5)					
Tinamus major	great tinamou	grote tinamoe	mamafowru-anamu	ololo	potuhna
Crypturellus cinereus	cinereous tinamou	grauwe tinamoe	anamu	mawi	mawi
Crypturellus soui	little tinamou	kleine tinamoe	pikin anamu, ston-anamu	suwi	suwi
Crypturellus erythropus	red-legged tinamou	roodpoot tinamoe	redifutu-anamu	?	makawa
Crypturellus variegatus	variegated tinamou	bonte tinamoe	tigri-anamu, redi anamu	maipo	sorosoroi
ANININGAS (1)					
Anhinga anginga	anhinga, darter	slangenhalsvogel	duikelaar, fisman	kiakokoima	kujakopoima
CERTAIN HERONS (5)					
Ardea cocoi	white-necked heron	sokoi-reiger, zwartkruinreiger	kumawari	?	wara
Pitherodius pileatus	capped heron	kapreiger	(sabaku)	akaraima/ wakaraimë	?
Egretta thula	snowy egret	kleine zilverreiger	(sabaku)	wakaraimë	?
Agamia agami	chestnut-bellied heron	agami-reiger	-	wakaraimë	kujawiwi
Tigrisoma lineatum	rufescent tiger-heron	rosse tijgerroerdomp	tigrifowru	onori	onore
ALL STORKS (3)					
Mycteria americana	American wood stork	houtooievaar	nengrekopu	*not eaten by Wayanas*	?

Euxemnura maguari	Maguari stork	magoeari	redifutu	*not eaten*	?
Jabiru mycteria	jabiru	jabiroe	blaasman	*not eaten*	?
IBISSES (1)					
Mesembrenicus cayennensis	green ibis	groene ibis	korokoro	toko	kuruku
CARACARAS (1)					
Daptrius americanus	red-throated cararara	roodpoot cararara	busikaka	?	kaakow

Scientific name	**English**	***Dutch***	**SN / ST**	**Wayana**	**Trio**
DUCKS (1)					
Cairina moschata	muscovy duck	muskuseend	bosdoks	urumaima	urumaima
CURASSOWS, GUANS & CHACHALACAS (5)					
Crax alector	black curassow	zwarte hokko	powisi	owok	oko
Penelope marail	marail guan	marail	marail	akawak	marasi
Penelope jacquacua	Spix's guan	Spix' sjakohoen	busikrakun	akawak	marasi
Ortalis motmot	little chachalaca	kleine chachalaca	wakago	aratkwa	araha
Aburria cumanensis	white-headed piping guan	blauwkeel guan	wet-ede marai	kuiwi	kuiwi
QUAILS & PARTIDGES (2)					
Colinus cristatus	crested-bobwhite	bobwhite, kuifkwartel	sabana-anamu	?	oi tokoro
Odontophorus gujanensis	marbled-woodquail	gemarmerde tandkwartel	tokoro	?	tokoro
TRUMPETERS (1)					
Psophia crepitans	grey-winged	trompetvogel	kamikami	makamari	mami

	trumpeter				
RAILS & GALLINULES (5)					
Aramides axillaris	rufous-necked wood-rail	roodnek-bosral	(anamu)	?	?
Aramides cajanea	grey-necked wood-rail	Cayenne bosral	kriko	?	?
Porzana albicollis	ash-throated crake	witkeel-porseleinhoen	(anamu)	?	?
Laterallus viridus	russet-crowned crake	roodkruinral	(anamu)	?	?
Porphyrula martinica	purple gallinule	purperhoen	blawkipanki	?	?

Scientific name	**English**	***Dutch***	**SN / ST**	**Wayana**	**Trio**
FINFOOTS & SUNBITTERNS (2)					
Heliornis fulica	sungrebe	kleine fuutkoet		?	?
Eurypyga helia	sunbittern	zonneral	sonfowru	ororaima	?
PLOVERS (8)					
Charadrius collaris	collared plover	kraagplevier	(snepi)	?	?
Bartramia longicauda	upland plover	Bartram's ruiter	(snepi)	?	?
Tringa solitaria	solitary sandpiper	bosruiter	(snepi)	?	?
Actitis macularia	spotted sandpiper	oeverloper	(snepi)	?	?
Gallinago galinago	common snipe	watersnip	(snepi)	waipipi	?
Gallinago undulata	giant snipe	reuzesnip	(snepi)	waipipi	?
Calidris pusilla	semipalmated sandpiper	grijze strandloper	(snepi)	?	?
Calidris minutilla	least sandpiper	kleinste strandloper	(snepi)	?	?
SKIMMERS (1)					

Rhynchops nigra	black skimmer	schaarbek	fisman	muramura	?
ALL PIGEONS & DOVES (13) incl.:					
Columba speciosa	scaled pigeon	geschubde duif	peni-ati busidoifi	uhtuku	uhtuku
Columba cayennensis	pale-vented pigeon	rosse duif	mangrodoifi , grun-ede doifi	uhtuku	uhtuku
Columbina passerina	scaly-bregsted ground-dove	musduif	grijze stondoifi	uruwë	oreh
Columbina minuta	plain-breasted ground-dove	dwergduif	grijze stondoifi	uruwë	oreh
Columbina talpacoti	ruddy ground-dove	steenduif	stondifi	uruwë	oreh
Leptotila verreauxi	white-tipped dove	Verreaux duif	pakadoifi, pasidoifi	warami	arami
Leptotila rufaxilla	grey-fronted dove	grijskruinduif	pakadoifi, pasidoifi	warami	arami

Scientific name	**English**	***Dutch***	**SN / ST**	**Wayana**	**Trio**
ALL MACAWS, PARROTS AND PARAKEETS (24) incl.:					
Ara ararauna	blue-and-yellow macaw	blauwgele ara	tjambaraaf	ararawa	arawawa
Ara macao	scarlet macaw	geelvleugel ara	bokraaf	kunoro	kinoro
Ara chloroptera	red-and-green macaw	groenvleugel ara	warauraaf	kujari	kujari
Ara severa	chestnut-fronted macaw	dwergara	rafruprakiki	?	karaakara
Ara manilata	red-bellied macaw	roodbuikara	morisi-rafruprakiki	sakai	sakai

Ara nobilis	red-shouldered macaw	roodschouderara	ston-rafuprakiki	?	?
Aratinga leucophthalmus	white-eyed parakeet	witoog-aratinga	(praskiki)	?	marakaana
Aratinga pertinax	brown-throated parakeet	maisparkiet	karuprakiki	werekere	?
Aratinga aurea	peach-fronted parakeet	goudvoorhoofd parkiet	sipaliwini-prakiki	?	*only at the Sipaliwini savanna*
Pyrrhura picta	painted parakeet	bonte parkiet	kapuweri prakiki	?	kurepephe
Forpus passerinus	green-rumped parakeet	groene muspapegaai	okro-prakiki	merew	merew-merew
Brotogeris chrysopterus	golden-winged parakeet	oranjevleugel-parkiet	kankantri prakiki	?	?
Pionites melanocephala	black-headed parrot	zwartkopcaique	wetbereprakiki	mapuje	pijepijeh
Pionus menstruus	blue-headed parrot	zwartoorpapegaai	margrietje	kurikuri	kudikanai
Pionus fuscus	dusky parrot	bruin margrietje	basra fransmadam	papakija	?
Amazona dufresniana	blue-cheeked parrot	blauwwang-amazone	(mason)	kijokjio	kijokjio
Scientific name	**English**	***Dutch***	**SN / ST**	**Wayana**	**Trio**
Amazona ochrocephala	yellow-headed parrot	geelvoorhoofd-amazone	(mason)	parawa	parawa
Amazona amazonica	orange-winged parrot	amazonepapegaai, oranjevleugel amazone	kulekule	kuraikurai	jarijari
Amazona farinisa	mealy amazon	grote amazone, Muellers amazone papegaai	mason	?	sorosoro
Deroptyus accipitrinus	red fan parrot	kraagpapegaai	fransmadam, waaier	?	kinakina

ALL HUMMINGBIRDS (19)				tukwi, tuka	tukwi, tukai
ALL TROGONS (5) incl.:					
Trogon viridus	white-tailed trogon	witstaart trogon	pingofowru	owori	oori
Trogon melanurus	black-tailed trogon	zwartstaart trogon	udulosofowru	owori	oori
Trogon violaceus	violaceous trogon	violette trogon	don fowru	owori	oori
ALL PUFFBIRDS (8)					
ALL BARBETS & TOUCANS (8) incl.:					
Capito niger	black-spotted barbet	zwarte baardvogel	papayafowru	?	kaikwisen
Pteroglossus viridus	green araçari	groene arassari	-	parawana	amantakana
Pteroglossus aracari	black-necked araçari	warned-arassari	-	kisi	keswimpeh
Selenidera culik	Guianan toucanet	Guyana-pepervreter	-	parawana	pumpuri
Tucanus vitellinus	channel-billed toucan	groefsnavel toekan, geelbeftoekan	blakanoso-kuyake	kuruw	kuruw
Ramphastos tucanus	white-throated toucan	roodsnaveltoekan	bigi kuyake	kiapok	kijapoko

Scientific name	**English**	***Dutch***	**SN / ST**	**Wayana**	**Trio**
ALL WOODPECKERS AND PICULETS (17)				wetu	wetu
ALL WOODCREEPERS (14)				makahoho	wakoko
ALL SPINETAILS (14)					
ALL ANTBIRDS (46)					

ALL TYRANT FLYCATCHERS (65) incl.:					
Pitangus sulphuratus	great kiskadee	grote kiskadie	grikibi	?	wiwi, wetephe
Tirannus melancholicus	tropical kingbird	tropische koningstiran	grikibi	?	wiripihi
MANAKINS (12), incl.:					
Pipra erythrocephala	golden-headed manakin	geelkop manakin	-	?	?
COTINGAS (21) & COCK OF THE ROCK (1)					
Phoenicircus carniflex	Guianan red cotinga	rode cotinga	-	?	maahtu
Cotinga cotinga	purple-breasted cotinga	purperborst-cotinga	-	?	weeki
Cotinga cayana	spangled cotinga	halsbandcotinga	blauwe cotinga	wanat	wanatu
Xipholena punicea	pompadour cotinga	pompadour-cotinga	bruine cotinga	pokoro	pokoro
Lipaugus vociferans	screaming piha	schreeuw-piha	busiskowtu, groenhartvogel	wajo	paipaje
Tityra cayana	black-tailed tityra	zwartstaarttityra	-	?	wakakakai
Querula purpurata	purple-throated fruitcrow	purperkeel-vruchtenkraai	-	siri	kajre-tehweh, wïki

Scientific name	**English**	***Dutch***	**SN / ST**	**Wayana**	**Trio**
Perissocephalus tricolor	capuchin bird	geelkruin cotinga	busikaw	?	ruwa
Haematoderus militaris	crimson fruitcrow	karmozijn vruchtenkraai	-	wapotojek	?

Gymnoderus foetidus	bare-necked fruitcrow	kaalnek-vruchtenkraai	blaw doifi	?	manima
Rupicola rupicola	Guiana cock-of-the-rock	rotshaan	rotshaan	meu	meu
ALL MOCKINGBIRDS (3) & THRUSHES (5) including:					
Mimus gilvus	tropical mockingbird	tropische spotlijster	dagukafowru	?	?
Turdus leucomelas	pale-breasted thrush	vaalborstlijster	boontjedief	wape	pajama
Turdus nudigenis	bare-eyed thrush	naaktooglijster	ger'ai boontjedief	kuraiwe	kuraiwe
ALL VIREOS & GREENLETS (5)					
ALL HONEY CREEPERS (8)					
ALL TANAGERS (30) including:					
Schistoclamys melanopis	black-faced tanager	sluiertangare	zwartkop, grijze savannevink, zwartmasker	?	?
Hemithraupis guira	guira tanager	guira-tangare	zwartkeel, mangrokanari	?	?
Hemithraupis flavicollis	yellow-backed tanager	geelstuittangare	geelstuit	?	?
Tachyphonus cristatus	flame-crested tanager	vuurkuiftangare	vlamkuif, oranjekuif	?	?
Tachyphonus surinamus	fulvous-crested tanager	goudkuiftangare	goudkruin	?	?
Tachyphonus rufus	white-lined tanager	zwart tangare	zwarte kin, tokokin	?	?

Scientific name	**English**	***Dutch***	**SN / ST**	**Wayana**	**Trio**
Tachyphonus phoenicius	red-shouldered tanager	roodschouder-tangare	roodschouder	?	wulami
Ramphocelus carbo	silver-beaked tanager	fluweeltangare	rode kin	kwitaki	kwitaki
Thraupis episcopus	blue-grey tanager	bisschoptangare	blauwforki	sikwi	sikwi
Thraupis palmarum	palm tanager	palmtangare	kronto blauwforki	sikwi	sikwi
Euphonia plumbea	plumbeous euphonia	grijze organist	savanneblauwdas-kanarie	?	ulramii. kanari
Euphonia finschi	Finch's euphonia	Finsch organist	blauwdaskanarie	kuramijik	ulramii. kanari
Euphonia violacea	violaceous euphonia	violette organist	geeldaskanarie	?	ulramii., kanari
Euphonia minuta	white-vented euphonia	witbuikorganist	wititerekanari	?	ulramii, kanari
Euphonia cayennensis	golden-sided euphonia	Cayenne-organist	grangrandier	?	ulramii. kanari
Tangara mexicana	turquoise tanager	turkooistangare	blauwvink, anijsvink, paleisvink, portretvink, epauletvink	?	?
Tangara chilensis	paradise tanager	paradijstangare	paradijsvink, zevenkleur, kuli-color	?	wisawisa
Tangara punctata	spotted tanager	druppeltangare	stippelvink, druppel	?	?
Tangara gyrola	bay-headed tanager	okerkaptangare	bruinkop	?	?
Tangara cayana	rufous-crowned tanager	sabeltangare	goudvink	?	?

Tangara velia	opal-rumped tanager	opaalstuittangare	bruinbuik	?	?
Dacnis lineata	black-faced dacnis	zwartmaskerpitpit	kraaloog, witbuik pitpit, pusi-ai	siwsiw	suri
Scientific name	**English**	***Dutch***	**SN / ST**	**Wayana**	**Trio**
Dacnis cayana	blue dacnis	blauwe pitpit	blauwe pitpit (male), groene pitpit (female)	siwsiw	knotoi
Chlorophanes spiza	green honeycreeper	groene suikervogel	zwartkop pitpit (male), groene pitpit (female)	siwsiw	knotoi
Cyanerpes caeruleus	purple honeycreeper	purperen suikervogel	geelpoot honingzuiger, purper honingzuiger	siwsiw	tukuje
Cyanerpes cyaneus	red-legged honeycreeper	blauwe suikervogel	roodpoot honingzuiger, blauwe honingzuiger	siwsiw	tukuje
Tersina viridus	swallow-tanager	zwaluwtangare	?	?	?
ALL FINCHES AND GROSBEAKS (21) such as:					
Volatina jacarina	blue-black grassquit	jacarina-gors	srio, dansmeestertje	?	pirinsu
Sporophila schistacea	slate-colored seedeater	leigrijs dikbekje	gelebek	?	kiripek
Sporophila plumbea	plumbeous seedeater	loodgrijs dikbekje	sabana mustas	?	mustas
Sporophila americana	variable seedeater	bont dikbekje	dyak, jack	?	?

Sporophila bouvronides	Lesson's seedeater	lessons dikbekje	plenmustas	mustas	mustas
Sporophila lineola	lined seedeater	witster-dikbekje	kroonmustas	?	mustas
Sporophila minuta	ruddy-breasted seedeater	dwergdikbekje	rowti, oransyka	?	roti
Sporophila castenaeiventris	chestnut-bellied seedeater	roodbuikdikbekje	blawbaka rowti	roti	roti
Oryzoborus crassirostris	large-billed seed-finch	dikbekzaadkraker	twatwa	twatwa	twatwa
Scientific name	**English**	***Dutch***	**SN / ST**	**Wayana**	**Trio**
Oryzoborus angolensis	lesser seed-finch	zwartkopzaad-kraker	picolet	pikolet	pikolet
Caryothraustis canadensis	yellow-green grosbeak	geelbuikkardinaal	gele vinktangara, sabana-twatwa	?	
Pitylis grossus	slate-colored grosbeak	witkeelkardinaal	roodsnavel, redimofo	piku	piku
Passerina =Cyanocompsa) cyanoides	blue-black grosbeak	blauwrugbisschop	bergitwatwa?	?	maripa-tetatakakai
ALL ORIOLES AND BLACKBIRDS (14) such as:					
Psaracolius decumanus	crested oropendola	kuiforopendola	ponpon	kulima	knoto
Psaracolius viridis	green oropendola	groene oropendola	busiponpon	tahe	tapui
Cacicus cela	yellow-rumped cacique	geelstuit-buidelspreeuw	geelrug banabeki	pajakwa	pasakua
Cacicus haemorrhous	red-rumped cacique	roodstuit-buidelspreeuw	roodrug banabeki	halau	sowha, saramin
Icterus chrysocephalus	moriche oriole	Moriche troepiaal	kaduri	?	
Agelaius icterocephalus	yellow-hooded	geelkoptroepiaal	gelekop,	?	?

	blackbird		ger'ede karufowru		
Molothrus bonariensis	shiny cowbird	glanskoevogel	putter	?	?
Scaphidura oryzivora	giant cowbird	grote koevogel	bigi karufowru	?	posisi

Scientific name	**English**	***Dutch***	**SN / ST**	**Wayana**	**Trio**
ALL TORTOISES & TURTLES (8) :					
Geochelone (Testudo) denticulata	yellow-foot tortoise	bosschildpad	Busisekrepatu	kuriaputpë/ kuliputpë	kurija-wëri (male) kurija-kïrï (female)
Geochelone (Testudo) carbonaria	red-foot tortoise	savanneschildpad	sabanasekrepatu	kuria	oi-kurija
Kinosternon scorpioides	scorpion mud turtle	modderschildpad		pejo	pejo piropahka
Rhinoclemys (Geomyda) punctularia		moerasschildpad	arakaka	kurarawa	warakaka
Podocnemis unifilis		geelkop-waterschildpad	kronneki, peni-ede arakaka	?	sawaru; pejo pinpahka
Phrynops gibbus (Mesoclemmys gibba)		bochelschildpad	kronneki, skoifineki	?	
Batrachemys nasuta (Phrynops nasutus)		gewone kikkerkop-schildpad	kronneki, skoifineki	kurarawa	pejo pujiji
Platemys platycephala	south-american snake-necked turtle	roodkop-deukschildpad	kronneki, skoifineki	kurarawa	pejo pinpahka
ALL CAIMANS (3)[46]					

[46] according to the Game Law, the spectacled caiman is a "game species", while both other caiman species are fully protected .

Caiman crocodylus	spectacled caiman	brilkaaiman	benedenlandse kaiman	ariwe/aliwe	ariwe
Paleosuchus palpebrosus	smooth-fronted kaiman	wigkopkaaiman	bovenlandse kaai-man, blakakaiman	ariwe	ariwe
Paleosuchus trigonatus	Schneider's caiman	dwergkopkaaiman	bovenlandse kaai-man, blakakaiman	ariwe	ariwe

Scientific name	**English**	***Dutch***	**SN / ST**	**Wayana**	**Trio**
SOME LIZARDS (4)					
Anolis punctatus	anolus	gras-anolus		suisui	
Iguana iguana	iguana	Groene leguaan	legwana	orori/ololi	iwana
Plica plica			agama	wakak	wasarapipa
Tupinambus nigropunctatus	tegu	reuze teju-hagedis	sapakara	hapakala	
SOME FROGS (2)					
Leptodactylus pentadactylus		reuze fluitkikker		umu	muru
Hyla boans		boomkikker		kutoh	koto

ICHTHYES - FISHES - VISSEN - FISI - KANA
MOST OF THE 193 RECORDED SPECIES LISTED IN ANNEX X

Scientific name	**English**	***Dutch***	**SN / ST**	**Wayana**	**Trio**	**Remarks**
INVERTEBRATA - INVERTEBRATES - ONGEWERVELDE DIEREN						
Atta sexdens / A. cephalotes	leaf-cutting ants	bladsnijdermieren , draagmieren	prasoromira	mikake	mikake	seri: roasted females (around New Year)
Rhynchophorus palmarum	palm weavel	palm-snuitkever (larve)	langamofo sege (woron)	iripe		tukuma: roasted larvae (found in heart of palm

						species)
Meliponidae spp.	stingless bees	angelloze bijen	blaka & redi oni	alama		Honey
Vespidae spp.	wasp larvae	wespen-larven	waswasi (woron)	kaphew	mulawale	fresh/roasted
		zoetwater-garnalen	switwatra sararara		piuru	
Potamocarcinus latifrons	river crab	rivierkrab	libakrabu	krabu	mokoko	
Macrobrachyum carinus	giant river shrimp	riviergarnaal	stonsarasra	isu	piuru	
Castalia & Diplodon spp.	fresh water mussels	zoetwater-mossels	(skropu)	?	pete	use not confirmed; *not eaten by Wayanas*
Doryssa spp.	freshwater snails	zoetwater-slakken	(pakro)	kuweme	mari	
Pomacea spp.	freshwater snail	zoetwater-slakken	(pakro)	konoto	kuwe	

TABLE b: TOOLS

Scientific name	**English**	**Dutch**	**Sur-Ned / Sranan**	**Wayana**	**Trio**	**Parts and use**
Dicotyles pecari	white-lipped peccary	witlip-pekari	pingo	peneke	pëinjekë	jaws with tusks used as plane
Tayassu tajacu	collared peccary	halsband-peccarie	pakira	pakira	pakira	jaws with tusks used as plane
Agouti paca	paca	Surinaamse haas, paca	haas, he	kurimau	kurimau	yaws with incisors used as chisel

TABLE c: HUNTING AND FISHING UTENSILS

Scientific name	English	Dutch	Sur-Ned / Sranan	Wayana	Trio	Parts and use
Bradypus tridactylus	three-toed sloth	drieteenluiaard	sonloiri	?	arekore	skin as lid of bamboo containers for poisonous arrow heads
Harpia harpya	South-American harpy eagle	harpij-arend	gonini	pija	iju	feathers as arrow shafts for more accurate shooting
Morphnus guianensis	crested eagle	wurg arend	pakani-aka	pija	?	feathers as arrow shafts
Sarcoramphus papa	king vulture	koningsgier	granman tingifowru	kuru	?	feathers as arrow shafts
Cathartes spp.	yellow-headed vulture	geelkopgier	blaka-tingifowru	awira	?	feathers as arrow shafts
Crax alector	black curassow	zwarte hoko	powisi	okoo	okoo	feathers as arrow shafts
Psittacidae & Ramphastidae	parrots & toucans	papegaaien & toucans	popokai & kuyake	?	?	feathers as adornments of bows and hunting arrows, and of bamboo containers of poisonous arrow heads
Dendrobatidae spp.	poison frogs	pijlgifkikkers		okopipi	okopipi	frog skin poison for arrow heads and/or for more accurate shooting (D. azureus is protected)
Characidae spp.	silver bait	karperzalmpjes	sriba	opi	opi	silver bait as bate for fishing

TABLE d: MEDICINES

Scientific name	English	Dutch	Sur-Ned / Sranan	Wayana	Trio	Parts and use
Alouatta seniculus	red howler monkey	brulaap	babun	arawata	arawata	gorogoro = larynx against stuttering
Cervidae spp.	deer	herten	dia	kariak	?	dia-tutu = antlers against convulsion
Ramphastidae spp.	toucans	toekans	kuyake	kiapok	?	soup of whole bird or dried beak against stuttering

TABLE e: INITIATION RITUALS

Scientific name	English	Dutch	S-N	Wayana	Trio	Parts and use
Vespidae sp.	stinging wasp	angelwesp-soort	waswasi	okomojot	?	wasp for kunana
Vespidae sp.	stinging wasp	angelwesp-soort	waswasi	kaphew	?	wasp for kunana
Vespidae sp.	stinging wasp	angelwesp-soort	kapasi-waswasi	kuruku	?	wesp for kunana
Vespidae sp.	stinging wasp	angelwesp-soort	waswasi	tuigkai	?	wasp for the kunana
Vespidae sp.	stinging wasp	angelwesp-soort	waswasi	toktoro	?	wasp for the kunana
Vespidae sp.	stinging wasp	angelwesp-soort	waswasi	apara	?	wasp for the kunana
Vespidae sp.	stinging wasp	angelwesp-soort	waswasi	muglowari	?	wasp for the kunana
Vespidae sp.	stinging wasp	angelwesp-soort	waswasi	orokot	?	wasp for the kunana
Formicidae sp.	stinging ant	angelmier-soort	ayuka-mira	yuk	?	ant for the kunana
Formicidae sp.	stinging ant	angelmier-soort	mira	irak	?	ant for the kunana
Formicidae sp.	stinging ant	angelmier-soort	mira	?	?	poison to fill skin incisions
Dendrobatidae sp.	certain poison frog(s)	bepaalde gifkikker (s)	mira	?	?	poison to fill skin incisions
Crotallidae sp.	poison snakes	gifslangen	mira	?	?	poison to fill skin incisions

TABLE f: ADORNMENTS AND MUSIC INSTRUMENTS[47]

Scientific name	English	Dutch	SN / ST	Wayana	Trio	Parts and use
ADORNMENTS						
Ateles paniscus	spider monkey	slingeraap	kwata	arimi	arimi	bones for combs
Primates spp.	monkeys	apen	yapyapi	?	?	teeth for necklaces
Dicotyles pecari	white-lipped pecari	witlip peccarie	pingo	peneke	pëinjekë	teeth for necklaces
Tayassu tajacu	collared peccari	halsband peccarie	pakira	pakira	pakira	teeth for necklaces
Panthera onca	jaguar	jaguar	peni-tigri	kakui	timenuren	teeth for necklaces
Harpia harpya	harpy eagle	harpij-arend	gonini	?	iju	feathers for headdresses; down feathers glued as adornment on skin and hair
Psittacidae & Ramphastidae	parrots & toucans	papegaaien & toucans	popokai & kuyake	?	?	feathers as adornments for combs, headdresses, hair tubes, necklaces and armlets.
Potamotrygon histrix	river stingray	rivier stekelrog	libaspari	sipari	sipari	stingray backbones as beads
MUSIC INSTRUMENTS						
Ateles paniscus	spider monkey	slingeraap	kwata	arimi	arimi	bones as fluits
Bradypus tridactylus	three-toed sloth	drieteen-luiaard	sonloiri	?	arekore	skins for drums
Mazama gouazoubira	grey brocket	klein boshert	busikrabita, kuriaku	kaliak	kajake	bones for flute

[47] for vegetal parts of body adornments and music instruments see Annex V

Podocnenis unifilis		geelkop-waterschildpad	peni-ede arakaka	?	sawaru	tortoise shell with cooked wax from stingless bee nests used as music instrument (Trio)
Psittacidae & Ramphastidae	parrots & toucans	papegaaien & toucans	popokai & kuyake	?	?	feathers as adornments for flutes and marakas

Annex VII: Trio hunting calendar

According to Mamia Pakoro Project Document (MEU 2001).

English name	Trio name	open hunting season
Brown capuchin monkey	taripi	May 1- July 31
White-lipped peccary Collared peccary	pëinjekë pakira	June 15 - December 31
Tapir	pai	March 1- August 15
White-tailed deer	wikapau	May 1 - January15
Giant anteater	masiwa	August 1 - January 15
Black Curassow	oko	August 1 - December 31
Black Caimans	ariwe	November 15 - January 31
Cock-of-the-rock	meu	Closed year around
Jaguar	timenuren	August 1 - September 15
Blue poison frog	okopipi	Closed year around