**Gendered Geographies and Participatory Processes –
Mapping Natural Resource Use with Wapichan Women in Southern Guyana**

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Abstract

Indigenous women have rarely been directly involved in participatory mapping projects in Latin America, despite the fact that they carry out unique natural resource use activities and have distinct and detailed environmental knowledge. This thesis describes participatory mapping research focused on gendered natural resource use in southern Guyana. Fieldwork conducted over eight weeks in 2004 with five trained Wapichan women included sketch mapping, interviews, focus groups and GPS field mapping. Analysis reveals that, while some resource use activities are shared, the spatial patterns of women's activities are distinct from those of men. Women's resource use is concentrated around the community, although this varies by household and age. Women's fishing and other water-based activities in particular reflect their distinctive geographies and extensive knowledge of the local environment. The findings of this study show that women can make significant contributions to community mapping processes, resulting in maps that are more representative of local realities.

Key Words

Participatory Mapping; Indigenous Peoples; Gender; Natural Resource Use; Guyana

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List of Acronyms and Glossary of Wapichan Terms¹

ALC	Amerindian Lands Commission
APA	Amerindian Peoples Association
ARU	Amerindian Research Unit
CBNRM	Community-Based Natural Resource Management
CDO	Community Development Officer
DDO	District Development Officer
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
FPP	Forest Peoples Program
GAD	Gender and Development
GIS	Geographic Information System
GoG	Government of Guyana
GPS	Global Positioning System
IPC	Indigenous Peoples Commission
NGO	Non-Governmental Organization
PCC	Patamona Community of Chenapou
PM	Participatory Mapping
RDC	Regional Development Council
UMADC	Upper Mazaruni Amerindian District Council
UNDP	United Nations Development Programme
WCED	World Commission on Environment and Development
WID	Women in Development
WRM	World Rainforest Movement
WWA	Wapichan Wadauniinao Ati'o
<i>Aia</i>	Forest vine ('bush rope'); used to poison fish
<i>Aishara</i>	Forest vine ('bush rope'); used to poison fish
<i>Ariwasho</i>	Species of turtle; chest used to make cotton spindles
<i>Baoko</i>	Water pool
<i>Benab*</i>	Open-air structure with a thatched palm roof
<i>Bina*</i>	Plant/animal 'treatment;' prepared to augment certain skills
<i>Casareep</i>	Thick syrup made from poisonous juice of bitter cassava
<i>Cayambi</i>	'Sandpaper Tree;' dominant woody species in savannahs
<i>Daddo</i>	Hammock weave
<i>Damorudu</i>	Clay pot; used to cook pepperpot (traditional meat dish)
<i>Darokai</i>	Firewood; slow-burning
<i>Daru</i>	Father
<i>Dazao</i>	Species of turtle; chest used to make cotton spindles
<i>Dopaawai</i>	Woven backpack; used for carrying farm produce
<i>Dowada</i>	Clay pitcher; used for keeping water cool
<i>Dyariko</i>	Species of turtle; chest used to make cotton spindles

¹ All of the terms in the glossary are in Wapichan except for words indicated by * (Creolise) and ** (Arawak)

<i>Farina</i>	Parched granules of bitter cassava; local food staple
<i>Idina</i>	Firewood; slow-burning; used to make coals
<i>Iwa</i>	Bamboo
<i>Jamoon*</i>	Fruit; grows in peoples yards in the village
<i>Kamoto</i>	Clay pitcher; used to keep water cool
<i>Kaoramnai</i>	Wooden weaving frame; used for making hammocks
<i>Kara'idaao</i>	Clay pot
<i>Karashai aradu'u</i>	Hammock weave; 'fish ribs' design
<i>Kari</i>	Drink (alcoholic and sweet); made from fermented cassava
<i>Katabaro</i>	Forest vine ('bush rope'); used to poison fish
<i>Kokizai</i>	Forest vine ('bush rope'); used to poison fish
<i>Koko</i>	Grandmother; elder
<i>Komaroo</i>	Purple plant cultivated in farms; used to poison fish
<i>Komti'inaba</i>	Leaf; ashes used as a dye for cotton spindles
<i>Konani</i>	Shrub cultivated in farms; used to poison fish; very potent
<i>(Kuba)Chimaridako</i>	A certain rock; used to make cassava graters
<i>Makochi-okon</i>	Plant cultivated in farms/grows wild; used to poison fish
<i>Manorin</i>	Form of collective labour
<i>Maroowaiba</i>	Sap/resin from a tree; used as incense to chase away spirits
<i>Matada</i>	Species of turtle; chest used to make cotton spindles
<i>Matapi</i>	Tube woven from bush vines; used to squeeze poison out of grated bitter cassava
<i>Midoda-mizoo</i>	Hammock weave
<i>Min</i>	Latex/sap from a tree; boiled and used as a glue
<i>Minau</i>	Brazil nut tree; known locally as 'Guyana nut'
<i>Mokoro</i>	Bush vine; used for basketry/craft making
<i>Natu-aiba</i>	Sap/resin from a tree; used as incense to chase away spirits
<i>Oopauzo</i>	Clay potter
<i>Owawashi</i>	Fruit found around the community
<i>Patuwu</i>	Hammock weave
<i>Piaiman*</i>	Traditional healer
<i>Potaru</i>	Clay pan; used for baking cassava bread
<i>Powizi</i>	Pod with red seeds inside; used for dye; also called 'anatu'
<i>Tao</i>	Mountain
<i>Tibi</i>	Bush vine; used in basketry/craft making; also called 'nibi'
<i>Tibisiri</i>	Processed fibre from leaf of the etai tree; used for basketry
<i>Tii kon</i>	Tree cultivated in farms; used to poison fish
<i>Toon</i>	Bush island; usually in savannahs
<i>Toshao</i>	Chief; Village Captain
<i>Turu</i>	Fruit; used to make drinks and oils
<i>Wa'o</i>	River; creek
<i>Wazi</i>	Fruit; used to make oil and repellent; also called 'awarra'
<i>Widyoko</i>	Fruit; found around the community

Preface

My interest in carrying out research in Guyana – a small country in lowland South America that remains a relative mystery to many people – stems from an internship in which I participated from September 2002 to April 2003. This internship involved two main projects, both of which fed into my decision to return and carry out fieldwork a year and a half later.

First, I was charged with the responsibility of facilitating a community development project in the remote Pakaraima Mountains in Guyana's interior. During the two months I spent in the village of Yurong Paru, I became interested in many aspects of daily life in the community and was made aware of some of the issues currently affecting Amerindian peoples: I attended discussions about changes to the *Amerindian Act*; I witnessed firsthand the social, environmental and health impacts of illegal mining; and I walked the land with local people, visiting sacred sites and listening to stories about the landscape and history of the area. When I left the community, a friend gave me a gift: a hand-drawn map of the area, showing physical, cultural and spiritual aspects of the landscape. This map became one of the links between my first work experience in Guyana and the fieldwork I later carried out for my M.A. research, which is presented in this thesis.

The second project was also located in Guyana's interior, but further south in the Rupununi savannahs. This time, I spent two months traveling by bicycle to 23 Makushi and Wapichan communities, facilitating meetings with various women's groups about

their activities and the challenges they are facing. This type of work had not been done before, and the information gathered formed the basis for a series of women's networking conferences. During this fieldwork, I visited the village of Aishara Ton and spent a few days meeting with local leaders and visiting with the women's groups. It was at this time that I decided I wanted to return to the Deep South and work on land-related issues. This brief visit and my wider involvement with establishing the women's conferences later became key in my return to the area: when my research application was received by the Aishara Ton Village Council in June 2004, local leaders of the women's groups spoke out and supported my return, despite some skepticism about outside researchers coming into the area to conduct fieldwork.

Interestingly, when I was leaving Guyana this first time, several people commented that they would see me again soon, because they had observed me drinking creek water and eating local meat, and legend has it that, once this is done, the Rupununi lifestyle and its people become a part of who you are. Indeed, my life has become enmeshed with the people and places of the Rupununi, and although they have taught me more than I can hope to give back, my intention is that the research presented in this thesis will contribute to ongoing, locally driven development initiatives that aim to secure rights to ancestral lands and resources.

E.K.W.

Chapter 1 - Introduction

1.1 A Brief Background: Indigenous Peoples² and Mapping Initiatives

Over the last three decades, an increasing number of indigenous groups around the globe have undertaken locally driven initiatives to produce maps that represent the lands and resources that they have traditionally used and managed. The resulting maps – informal (i.e., sketch maps) and formal (i.e., digital maps) – are often counter to government maps that represent the same geographical areas. These acts of mapping are thus referred to as ‘counter-mapping,’ as well as by a variety of other terms including ‘community mapping,’ ‘ethn cartography’ and ‘land use and occupancy studies,’³ and they involve the assertion of indigenous perspectives of territoriality through “sites of cartographic resistance” (Turnbull 1996: 72). As mapping technologies become increasingly affordable and user-friendly, more indigenous groups are using them – often in conjunction with outside researchers, non-governmental organizations and, in some cases, government surveyors and cartographers – to document local knowledge within a more formalized and conventional framework.

² The term ‘indigenous peoples’ is highly politicized and in some instances is deemed problematic, since it collectivizes distinct populations whose historical experiences and daily realities are vastly different. However, it is important to recognize that this type of broad categorization can be used as a strategic means to link people at the local level to larger political movements, on national or global scales. For the purposes of this thesis, the term ‘indigenous peoples’ is broadly defined as the collectivization of a diverse range of peoples who have been subjected to both territorial and cultural colonization, and who maintain identities that differ from those as defined by dominant national discourses (Smith 1999). Indigenous populations in Guyana are commonly referred to as ‘Amerindians.’

³ See Chapin, Lamb and Threlkeld (2005) for a comprehensive overview of the various methodologies and terminologies relating to indigenous mapping.

Although there are some limitations in representing dynamic and process-oriented worldviews within a Cartesian framework – and there are potential risks in exposing local knowledge to outside parties – the production of standardized cartographies provides indigenous groups with texts that are more likely to be legitimated within dominant political and legal institutions. Indeed, many community maps are being used to support indigenous land claims and to develop resource management plans for ancestral lands; the act of mapping is thus political, but can also be linked to community empowerment through promoting dialogue and facilitating awareness about the importance and profundity of local knowledge. Community-based mapping initiatives are also being recognized by many development and conservationist theorists, practitioners and policy-makers as a viable means of involving local populations and their knowledge in community development and biodiversity conservation schemes.

In Latin America, a methodology has evolved and been refined through its implementation with several indigenous communities since the early 1990s and has been termed ‘participatory mapping’ (Herlihy & Leake 1997). Participatory mapping (PM) is an approach to community mapping that aims to gather spatial data and geographical information based on local (environmental) knowledge and involves local people as collaborators in the mapping and research process, who are hired and trained in various roles. PM is a type of “community-based cartography” (Herlihy & Knapp 2003: 303) that aims to translate cognitive conceptualizations of space and place – or ‘mental maps’ – into more conventional forms, using both qualitative and quantitative techniques. Although women have been part of many types of community mapping projects, their

participation has often been limited to the production of informal maps; they have rarely been directly involved in the technical mapping process as hired and trained investigators. This thesis therefore explores one under-represented aspect in the field of community mapping: the gendered dimensions of participatory mapping.

1.2 The Central Purpose of the Research: Engaging Women's Participation and Incorporating Their Knowledge into Participatory Mapping Initiatives

Drawing from various ideas relating to community-based natural resource management (CBNRM) approaches and put forward by feminist political ecologists, this research argues that there are gender differences in terms of people's daily experiences, resource-based activities and involvement in local decision-making processes. This in turn affects how people perceive and interact with the local environment, which can result in women and men having different levels of knowledge about, and varying priorities relating to, natural resource management. As such, landscapes are gendered, and there is a need to include women's geographical knowledge in cartographic representations of community lands, to ensure that maps are representative of diverse land uses and multiple resource users.

The central purpose of this thesis is therefore to complement and move beyond earlier studies by using PM methods and gender-sensitive research techniques with indigenous women, to document their environmental knowledges and the spatial patterns of their natural resource use. This is done in order to:

- (i) consider women's role in PM endeavours;
- (ii) better understand gendered resource use patterns and women's geographies;

- (iii) assess the effectiveness of including gendered spaces and places on community-scale maps.

This necessitates a consideration of what women's natural resource use activities are, how they differ from men's activities, and how women's resource use patterns are distributed over space. The analysis draws from fieldwork that was carried out in an Amerindian (Wapichan)⁴ community in the southern interior of Guyana, South America.

1.3 Contextualizing the Research: Community Mapping Initiatives Among Amerindian Communities in Southern Guyana

Over the past few years, community mapping projects have been undertaken in the southwest of Guyana, where Amerindian communities are being affected both by an increase in legal and illegal mining activities (Colchester, LaRose & James 2002) and by the proposed establishment of protected areas that could alter or limit their autonomy over ancestral lands (LaRose 2004). A series of technical, standardized maps has been produced using participatory methods, to represent Amerindian use and occupancy of ancestral lands. These maps are the most detailed representations of the area and are thus significant and valuable texts.

Recently, the objectives of these mapmaking activities have diversified from a singular focus on supporting land rights to developing local management plans (James 2004b; APA 2005). In the study area, a locally based and widely supported organization made up of local chiefs – the Deep South *Toshaos* Council – intends to use community maps in designing a region-wide resource management plan.

⁴ This Amerindian group is more commonly referred to as 'Wapishana' in government documents and other texts, but 'Wapichan' better reflects the local pronunciation of the term and is thus preferred.

Using a methodology similar to that of these earlier projects, my own research builds on a mapping process that was carried out in 2003 in the village of Aishara Ton.⁵ The analysis provided in this thesis uses these maps as a basis to explore how women's geographies and geographical knowledge may differ from those of men, and to assess how women can be successfully engaged as trained investigators in PM processes. The data collected can add some detail to the 2003 maps of Aishara Ton, and can thus contribute to local-level resource management planning. This research also fits into the long-term development plans of the Deep South *Toshaos* Council.

1.4 Outlining the Broader Objectives and Key Research Questions of the Study

As indicated above, the primary purpose of this research is to document and analyze the gendered patterns of natural resource use in Aishara Ton Village, with the collaboration of Wapichan women and using PM techniques. This thesis also briefly discusses how shifts in local social structures (i.e., gender roles/responsibilities, inter-generational differences) are affecting the natural resource use activities and geographies of local women. This allows an assessment of how women can add unique data to community maps, and when it is most important to engage their direct participation in the process. More broadly, the links between gender and natural resource management are explored, to see how a consideration of gender can effect more equitable and sustainable plans. The research objectives were pursued through a focus on the following key questions:

⁵ This village is more commonly referred to as 'Aishalton' in government documents and other texts, but the Wapichan pronunciation and meaning is more adequately reflected in the spelling 'Aishara Ton' and is thus preferred.

1. *How does gender affect natural resource use?*
 - a) Does natural resource use differ for women and men? Do women and men carry out exclusive or overlapping resource-based activities?
 - b) What are the natural resources used by women in Aishara Ton? What is a woman's resource use activity?
 - c) Does natural resource use differ among women? How?
2. *What are the geographies of women's natural resource use and (how) can their geographical knowledge be represented on community-scale maps?*
 - a) Does gender affect people's movements in and around Aishara Ton?
 - b) What are the spatial patterns of women's natural resource use? What accounts for these patterns?
 - c) How can women's geographies and geographical knowledge be represented on community-scale maps? When is it most important?

1.5 Putting Theory into Action: An Overview of Fieldwork Activities

Fieldwork was carried out over eight weeks from October to December 2004 in the village of Aishara Ton, a predominantly Wapichan community of approximately 1,200 people⁶ located in southwestern Guyana. This village was chosen as the site for fieldwork on the basis of the importance of natural resources in sustaining local livelihoods. In addition to the 2003 mapping project, many of the leaders and community members of Aishara Ton are active promoters of other locally driven conservation and development initiatives. This provided an opportunity to involve local leadership in the initial design of my fieldwork, and to dovetail my research objectives and methodological approach with those already underway in this Wapichan community.

⁶ This number is somewhat variable since there are limited population statistics for Amerindian communities in Guyana. The population of Aishara Ton also fluctuates according to the time of year (e.g., many families move out of the village to their farms during the school holidays in August, and many people return to Aishara Ton in December for Christmas celebrations).

Five women from Aishara Ton were hired and trained as local investigators, and were involved in the research process and data collection for the duration of fieldwork activities. These activities included a women's mapping workshop, individual interviews, a focus group and participant observation. Field mapping was also carried out with a handheld global positioning system (GPS) receiver, to document the locations of women's water-based resource use activities. This information was transferred onto base topographic maps of the area, which had been modified with the addition of numerous local toponyms. These field data were presented to community members during a final meeting, which garnered feedback and discussion about the research process and future mapping endeavours.

1.6 Broadening the Scope: Practical, Methodological and Theoretical Contributions of the Research

This thesis has practical benefits for residents of Aishara Ton, since it fits within an ongoing and locally driven initiative. Upon completion, all the maps and data will be returned to and shared with the community, and efforts will be made to ensure that information can be incorporated into existing map databases, or used for other purposes deemed relevant by members of the community. The documentation and analysis of women's resource use activities provide important baseline data, which can be used in part to monitor changes in the local environment as well as to archive traditional knowledge. Also, both the process of carrying out this research (i.e., training five local women) and the analytical outcomes (i.e., the documentation of additional geographical and cultural information) can contribute to the ongoing efforts of Amerindian peoples to (re)claim control of and management over local lands and natural resources.

In addition, the adoption of PM approaches by indigenous communities in Latin America is a relatively recent undertaking, and fine-tuning of the methodology continues. There are a limited number of documented case studies to date, none of which have focused on involving women in the more technical aspects of mapmaking (see Chapin & Threlkeld 2001). Therefore, this study is one of the first attempts within lowland South America to directly involve women in a PM project as trained local investigators. Analysis of the field data and fieldwork experience can thus help to indicate when it is most relevant and appropriate to involve women in PM processes.

Finally, there is little published material on Wapichan lifestyles and cultural ecology. Studies relating to the current situation of Amerindian communities in Guyana are also limited, and even more so regarding gender dynamics within them (Watkins 1998a). Although there is a substantial amount of literature linking theories of natural resource management and gender analysis, relatively few studies have been carried out within the context of Latin America.⁷ An article outlining Latin Americanist scholarship on women refers to only three studies that focus on rural Latin American women, and no studies related to indigenous women (Schroeder 2002). This thesis can therefore contribute to areas of literature that have thus far been relatively unexplored.

⁷ For example, an annotated bibliography that references 164 books, journal articles, book chapters, conference papers and electronic publications that relate to women and gender issues in natural resource management cites only 16 that are either directly or indirectly related to the Caribbean, Central and South America (KIT 2002).

1.7 Structure of the Thesis: Outlining the Remaining Chapters

The remainder of the thesis is divided into six chapters. Chapter two introduces the central bodies of literature that provide the thesis' theoretical foundations. Ideas relating to social theory and cartography, PM, CBNRM and feminist political ecology are drawn on and analyzed to inform and explain the methodological approach used in this study. Chapter three, which provides the contextual background for the research, includes a brief overview of Amerindian populations, state-indigenous relations regarding indigenous land and resource use rights, the emerging indigenous movement and counter-mapping initiatives among Amerindian communities, and the position of Amerindian women in Guyana. Chapter four presents an overview of the study area (Deep South, Rupununi) and the field site (Aishara Ton Village) and also outlines the methodological approach and fieldwork activities undertaken for this thesis. Process and data outcomes, analytical techniques and the limitations of the study are summarized and discussed.

Chapter five provides a detailed analysis of the gendered dimensions of home-centred and resource-based activities in Aishara Ton Village, and draws out three general patterns of gendered natural resource use. It includes discussion of the interactions between women and men, as well as variations among women, with regard to use of natural resources, exploring differences between households and across generations. Chapter six explores the geographies and geographical knowledge of women in Aishara Ton. Three broad environmental areas where women go to collect natural resources are identified, and their activities within each of these areas are discussed to assess whether this information can or should be incorporated into community-scale maps. Water-based

resource activities in particular are analyzed, because they exemplify how women have unique interactions with and detailed information about the local environment. Finally, chapter seven provides a summary of the research results and discusses the methodological and practical implications of this thesis, linking the fieldwork and analysis to broader aspects of PM and resource management planning and presenting possible future directions for this type of research.

Chapter 2 – Theoretical Underpinnings

Maps, Counter-Maps, Participatory Processes and Gendered Landscapes

This chapter presents the theoretical foundations for the research I undertook in Aishara Ton Village, Guyana. It includes a brief discussion of how social theory and post-modernist critiques have informed approaches to cartographic representation. From this perspective maps are understood as texts subsumed within particular historical, political and cultural contexts. Several indigenous communities around the globe are drawing on this notion and are (re)presenting their ancestral lands by creating counter-maps. In Latin America, participatory mapping (PM) has emerged as a methodology that combines participatory research techniques with the use of modern mapping technologies to record local knowledge. However, there is limited documentation regarding the role of women within these processes in terms of both the integration of their particular knowledge into formalized community maps and their involvement in the more technical aspects of mapping. I draw from community-based resource management and feminist theories to argue that women should have a more direct role in PM projects. This is especially relevant when the objective of mapmaking moves beyond the purpose of supporting land claims to using community maps as the basis for natural resource management planning. I discuss some of the differences in PM and gender resource mapping approaches, to explain how they were combined to develop the methodological approach used for this study.

2.1 Cartography and Social Theory: Rethinking Representational Texts

The map, as a textual representation of a particular space, is often presumed to be an objective representation of ‘reality’ since it remains neutral in depicting topography, roads and highways, or political boundaries. However, the rise of post-modernist and post-structural thought has prompted a deeper analysis of the normative symbols and structures of society to expose how power is inherently infused within them. This post-modern movement has included a deconstruction of the map-as-text, thus revealing the imperial assumptions, normative tendencies and power dynamics that underlie such representational texts (Harley 1988, 1989, 1990; Rundstrom 1991; Wood 1992; Edney 1993; Turnbull 1996).

It has been argued that dominant, conventional cartographies, which are founded upon scientific modes of understanding and methods for representing space, have acted to normalize particular historical narratives and structures of knowledge, to the detriment of alternative spatial expressions (Turnbull 1996; Sparke 1998; Shapiro 1999). This normalization can be traced back to the period of European Enlightenment, when a ‘mathematical cosmography’ emerged alongside the rise of scientific inquiry and analysis as the legitimate framework for understanding ‘true’ and ‘objective’ reality. It included the standardization of mapmaking techniques that were founded upon ideals of accuracy, measurement, geometric representation and the fragmentation of space into compartmentalized units (Edney 1993; Turnbull 1996). During this period, European governments and elitist groups controlled and financed cartographic enterprises, and maps were effectively used as a link between territory and the political and economic

rules that were applied to it. This type of systematic mapping allowed states to justify the appropriation, regulation and control of land and the people inhabiting it (Harley 1989; Edney 1993).

In his writings, Brian Harley (1988, 1989, 1990) presents the map as a highly subjective and powerful tool that has been normalized through the dominance of scientific analysis as an ‘objective’ and ‘truth-seeking’ means of representing knowledge. Harley’s work has been central in the theoretical deconstruction of conventional maps, and he argues that these texts must be put into context, claiming that their production and analysis should be rooted in social theory rather than in scientific positivism. This approach is based on the idea that maps are value-laden rather than value-free images (Harley 1989). Harley proposes that maps are inherently a type of language because they are encoded images used to mediate people’s perceptions of the world and understandings of reality. Building upon this observation, he discusses maps in terms of their symbolic nature – they have a literal ‘surface’ symbolism, but they also maintain a much deeper symbolic level; it is within this deeper level of symbolism that power is communicated and effectively reproduced. Power can be exerted both on cartography, in terms of how a map is drawn (i.e., how images are manipulated, how and where symbols are located), and with cartography, in terms of how space is represented (i.e., where boundaries are drawn, what is included/excluded). His third point relates to the idea that knowledge – as it is represented both upon and within maps – is a social product and therefore is inescapably bound to questions of power, and power itself is inevitably

implicated in the production of knowledge (Harley 1988).⁸ The deconstruction of imperial cartographies to reveal their subjective foundations, strategic implications and homogenizing tendencies thus exposes the fact that maps can, in fact, “wear many masks” (Wood 1992).

When viewing maps in this way – as subjective and social constructs – it is possible to move beyond scientific reasoning and Cartesian modes of representation and recognize alternative forms of ‘knowing’ and representing spatial relationships. In mapping projects involving indigenous communities there may be more of a focus on the process of mapmaking than on the creation of standardized texts. This necessitates recognition of how alternative realities are expressed and of maps as dynamic processes rather than as end products (Rundstrom 1991, 1995). Woodward and Lewis (1998) emphasize how the roles and meanings of maps are historically and culturally dependent; their volume on the cartographies of ‘traditional’ African, American, Arctic, Australian and Pacific cultures unveils the multitude of ways in which non-Western forms of spatial understanding have been depicted throughout history.⁹ Until recently, these alternative expressions – which often do not fit within the confines of the scientific method – had been given little recognition. However, “sites of resistance” (Turnbull 1996) within dominant cartographies have been exposed. Around the globe, indigenous groups are

⁸ This notion relates to Foucault’s discussion of the ‘twin concepts’ of power/knowledge in connection with how disciplines of knowledge are formed, used and developed in order to maintain the circular currents of power that flow among all levels of society. According to this view, one cannot be seen as separate from the other (Rabinow 1984). See Belyea (1992) for a critique of Harley’s interpretation of the writings of social theorists Foucault and Derrida.

⁹ It is important to note that, historically, the production of conventional maps has often been informed by indigenous and/or cultural maps of the same areas, and therefore it is difficult to draw a distinct line between ‘traditional’ and ‘European’ cartographies (see Woodward & Lewis 1998: 540).

(re)presenting their alternative cartographies and are at times appropriating modern mapmaking tools to reassert their cultural and territorial identities.

2.2 Cartographies of Resistance: Indigenous Peoples, Counter-Mapping and Participatory Mapping in Latin America

Historically, maps have been viewed as “tools of the powerful” (Harley 1988), their production controlled and defined by government agencies and elitist groups with access to the technological means to create them. However, within recent decades state mapping technologies have been appropriated by indigenous groups and organizations around the world, and in many cases the outcome has been maps that counter dominant (state) cartographies (Orlove 1993; Denniston 1994; Nietschmann 1995; Peluso 1995; Sparke 1998; Hodgson & Schroeder 2002). Counter-mapping activities among indigenous groups range from the creation of informal maps – such as ephemeral pictures drawn in the sand – to the production of conventional, standardized maps through more technical means. The creation of informal maps is often associated with mobilizing and empowering local communities, raising community awareness, facilitating conflict resolution and promoting cultural diversity (Hodgson & Schroeder 2002). In contrast, standardized maps are created mainly to support land claims, to demarcate traditional territories, and to manage natural resources (Poole 1995a). However, these varying approaches are not mutually exclusive: data collection methods and representational techniques will differ depending on the overall objectives and on the context within which a project is carried out, and may involve the creation of both informal and more formalized community maps.

Despite concerns that integrating the local knowledge of indigenous peoples into Western-style forms of cartographic representation could misrepresent their spatial understandings (see Rundstrom 1995), several indigenous groups have chosen to (re)present their lands and worldviews in this way (Poole 1995a, 1995b; Chapin, Lamb & Threlkeld 2005). In Latin America, an increasing number of indigenous groups have linked up with academic researchers, non-governmental organizations and, at times, government agencies to produce standardized maps representing their lands and resources. Participatory research techniques¹⁰ have frequently been used to allow the transformation of cognitive and intangible knowledge into more conventional cartographic forms (Herlihy & Leake 1997; Chapin & Threlkeld 2001; Herlihy 2001, 2003; Herlihy & Knapp 2003; Smith 2003; Stocks 2003; Colchester 2005; Poole 2005).

Participatory mapping (PM) provides a framework for expressing local spatial and territorial perceptions and for documenting the geographical knowledge of local peoples. PM employs both qualitative and quantitative methods, and one of its most fundamental aspects is the direct involvement of local peoples as trained investigators in mapping, surveying and research activities. This is founded on the notion that a local population maintains the most detailed knowledge of its surrounding environment, and that its members can be trained in the necessary skills to collect and interpret accurate

¹⁰ Participatory research ideally aims to recognize and validate local knowledge and priorities, and to acknowledge local people as collaborators in the mapping process rather than as the subjects of the research being undertaken (Chambers 1996). In reality, participatory research exists on a type of continuum: on the one end, a token involvement of local participants means that control over the process, outcomes and analysis of data remains with the researcher; on the other end, the full involvement of local participants means that they maintain ownership of the research process and are involved at all stages of it, from the definition and prioritization of objectives and research questions to the collection and analysis of data (Morris 2002).

geographical data. PM processes often involve transcribing information from informal maps (e.g., sketch maps) onto topographic base maps using various cartographic techniques and technologies, to produce conventional, standardized community maps. These maps can improve our understanding of local geographies, since the places documented and the patterns of human–environmental interactions represented are often presented in more detail than on existing maps of the same area (Brody 1988; Nietschmann 1995; Chapin & Threlkeld 2001).

Although some PM studies have involved women, there is limited documentation of how they have been included in these processes, whether their particular knowledge has been integrated into the final maps produced, or whether their needs and priorities have been adequately reflected in the objectives of the mapping projects (King 2002). There is minimal indication that women have been hired and trained as local investigators in PM projects, or that they have been actively involved in data collection and analysis. For example, a monograph discussing the successes and shortcomings of five PM projects carried out in Latin America over the last decade reveals that none of the local investigators involved were women (Chapin & Threlkeld 2001). This lack of direct participation by women is attributed to factors such as male-dominated political structures, safety concerns (i.e., traveling between communities is considered too dangerous for women) and perceptions that men have more extensive knowledge of environments beyond the immediate confines of their villages. However, the authors acknowledge that women have knowledge of and perspectives on local landscapes that

differ from men's based on their diverging roles and activities relating to natural resource use:

Women in many cultures are in charge of key subsistence activities and will consequently be the most appropriate choice for gathering data about those activities. If the area being mapped is close to the village, women may have better knowledge of it than men (Chapin & Threlkeld 2001: 127).

The gender dimensions of natural resource use and management have been emphasized by feminist scholars for over three decades, and more recently they have also been recognized by proponents of co-management approaches to natural resource management as important factors in the conduct of equitable processes and the achievement of sustainable outcomes.

2.3 Exploring Theories of Community-Based Natural Resource Management and Feminist Political Ecology

In the late 1980s a shift in mainstream approaches to development led to the promotion of decentralized government programs, increased participation of local stakeholders and the validation of local knowledge as more sustainable alternatives to previous top-down approaches (WCED 1987; Berkes 1995; Leach, Mearns & Scoones 1999; Agrawal & Gibson 2001). Co-management has since emerged as a model for promoting more community-level involvement in environmental management initiatives. It involves a sharing of responsibilities among various levels of government, community-based organizations and other local stakeholders (Berkes 1995; Leach, Mearns & Scoones 1999). Community-based natural resource management (CBNRM) is one approach to co-management that supports the highest level of participation by local

peoples in decision-making relating to the use and management of natural resources, since they are seen to be “the ones with the greatest stakes in [the] sustainability of resources and institutions” (Agrawal 2002: 41). Despite the promotion of CBNRM strategies by government agencies and international funding agencies, especially in developing countries, the implementation of policies and projects on the ground has continued to fall short of expectations (Leach, Mearns & Scoones 1999). This can be partially attributed to difficulties in linking state- and local-level management programs (Berkes, George & Preston 1991; Wiens 2003), but it has also necessitated a deconstruction and reconceptualization of the notion of ‘community.’

To ensure that policy interventions for environmental management are appropriate to local contexts and effective in their implementation, communities must be recognized as highly politicized social networks influenced by local institutional arrangements.¹¹ In this sense, communities should be understood as heterogeneous, loosely bounded entities that are comprised of groups and individuals with varying priorities and differential access to political, social, economic and environmental resources (Gujit & Shaw 1998; Agrawal & Gibson 1999; Leach, Mearns & Scoones 1999).¹² As an extension of this, it is important to acknowledge that the power dynamics

¹¹ Local institutional arrangements can be broadly defined as “sets of formal and informal rules that shape interactions of humans with others and with nature,” and they “mediate, soften, attenuate, structure, mould, accentuate, and facilitate particular outcomes and actions” (Agrawal & Gibson 1999: 637). Leach, Mearns & Scoones (1999: 226) define institutions relating to natural resource management as “regularized patterns of behaviour between individuals and groups in society as a whole” that include formal and informal structures.

¹² Just as communities are not homogenous or bounded social groups, so it cannot be assumed that households function as a single, apolitical entity (Meinzen-Dick & Zwarteveen 2001). Consequently there is a need to shift focus from analysis of gendered relations within more formal organizations and public forms of participation to assessment of intra-household dynamics and gendered interactions within informal institutions (Cleaver 2000; Wiens 2003).

at play within any community may afford certain groups or peoples a louder voice in decision-making, and perspectives that may differ from the (perceived) dominant viewpoints may not be considered or assigned as much value. Often it is the voices of women that are silenced in this way, which is problematic when it is considered that gender roles may define relationships between people and their environments (Rocheleau 1995a; Joekes, Green & Leach 1996; Rocheleau, Thomas-Slayter & Wangari 1996; Cleaver 2000; KIT 2000).

The particular resource-based activities of women, their perceptions of local landscapes and their knowledge of environmental management issues have been highlighted as important considerations in development and conservation planning since the 1970s, when Women in Development (WID) theories emerged alongside feminist scholarship (Warren 1992; Rodda 1993; Vavrus & Richey 2003). Ideas put forward by WID advocates have more recently taken on a gender-focused perspective known as Gender and Development (GAD). GAD theorists argue that development programs and policies should recognize the complexity and dynamism of gender relations and need to take into consideration how gender roles and responsibilities are negotiated by and between both women and men (Joekes, Green & Leach 1996; Cleaver 2000; Sass 2002).¹³

¹³ In this sense, there has been a theoretical shift away from a focus on 'women' as a biological category to an emphasis on how an understanding of gendered institutions and social relations can be more effective in advancing women's empowerment (Vavrus & Richey 2003).

The work of feminist political ecologists has emerged from GAD scholarship and highlights the political and power dimensions that underlie local institutional arrangements, specifically in how they relate to gender and human–environmental interactions. Scholars within this field call for an improved understanding of how local struggles over natural resources are enacted. Their work illuminates how several axes of power operate simultaneously to control people’s access to and control over natural resources, with particular emphasis on gender as a primary factor in these struggles (Rocheleau 1995a, 1995b; Thomas-Slayter, et al. 1995; Rocheleau, Thomas-Slayter & Wangari. 1996). Feminist political ecologists argue that policy-makers, researchers and development practitioners promoting the goals of sustainable and equitable development must take into consideration the multiple uses and users of local resources. Additionally, projects must be designed across multiple scales (i.e., intra-household, inter-household, community, regional, etc.) in order to successfully address the complexities of local land use and management practices (Rocheleau 1995a). These scholars also emphasize how gender will define different perceptions, knowledges and uses of local landscapes for women and men. When discussing the idea of gendered knowledge, Rocheleau states:

In practical terms, gender division of knowledge may be based on particular places whether by ecozone or by land use type. Men’s and women’s knowledge may also be divided by plant and animal species, products, particular uses or particular activities (1995a: 12).

Drawing on this notion, it can be argued that the spatial patterns of natural resource use may also be gendered, and therefore a “gender-based analysis of how spaces and places are used, valued, and struggled over” (Rocheleau, Thomas-Slayter & Edmunds 1995: 62) is an important consideration when carrying out community mapping

projects. Authors of an article on gendered resource mapping call for the creation of counter-maps specifically with women – maps that represent the views of women, whose knowledge is often omitted from scientific discourse and who are often excluded from processes of political decision-making or negotiation relating to land use and management (Rocheleau, Thomas-Slayter & Edmunds 1995). More broadly, gender-sensitive research methods can be used in combination with participatory research techniques in working with women and men, either together or separately, to record the ways in which landscapes are gendered. These qualitative techniques can also be integrated with quantitative methods in order to value and verify subjective experiences:

The work of interpretive scholars and the “turn towards discourse” (Peet and Watts 1993) have opened a new epistemological space for the combination of traditional positivist methods – such as resource mapping from remotely sensed data and questionnaire surveys about resource use and management – with personal life histories, oral histories, text analysis, landscape interpretation, and participatory mapping techniques (Rocheleau 1995b: 459).

The combination of methods means that those people and places that are often under-represented on “maps-as-usual” (Rocheleau 1995b) can be made visible, and diverse perspectives on landscapes and natural resource use can be documented (see also Rocheleau 2005). In this way, numerous realities are validated and various interpretations of local environments are recognized.

2.4 Revealing Gendered Landscapes: Combining Participatory Mapping Methodologies and Gender-Sensitive Research Techniques

PM initiatives and gendered resource mapping approaches both draw on the theoretical framework and practical methods of participatory research. However, it is

important to note that they tend to differ in three significant ways: in their overall objectives and methods, in the juncture at which power is situated, and in the scale at which they are focused.

The objectives of many PM projects are often focused on the acquisition of land rights and gaining/maintaining control over local resources. Therefore, the production of conventional, standardized maps tends to be prioritized, as these documents may be used in negotiations with external parties and geographic information system (GIS) programs may be employed to develop comprehensive resource management plans. Additionally, PM methodologies emphasize the role of local investigators in the implementation of diverse research methods, such as facilitating community meetings, administering questionnaires, gathering census information, recording toponyms, drawing sketch maps and plotting information onto base cartographic sheets (usually topographic maps of an area) (Herlihy & Leake 1997; Herlihy 2001; Smith 2003). In contrast, gendered resource mapping initiatives have tended to highlight the different access rights and uses of natural resources for women and men within particular communities or households. Thus far, informal sketch maps produced by local participants, which document the differentiated and gendered knowledges of local landscapes, have been used to generate discussion and build awareness of the gendered dimensions of natural resource use at a more localized level (Rocheleau, Thomas-Slayter & Edmunds 1995; Thomas-Slayter et al. 1995; Willmer & Ketzi 1998). As such, the training of local women (and men) in the more technical aspects of mapmaking and data collection has not been prioritized.

This divergence in project objectives is linked to the second difference between PM and gendered resource mapping approaches: how power is situated. PM projects tend to promote intra- and inter-community cooperation, consensus, and the attainment of communal ownership and control over resources. In this context, the focus is on addressing the differential power dynamics and inequalities that often put the needs and interests of local communities in opposition to those of external agencies (e.g., government or private interest groups), and conflict over land and resources tends to be analyzed at this broader scale. In contrast, gender analyses tend to deconstruct the notion of 'community' in order to assess how power is differentiated within it. Gendered resource mapping initiatives aim to document the diversity in resource use, access rights and environmental knowledge held by women and men within local contexts.

Thus, the scale at which these two approaches are implemented also differs. Whereas most PM projects have been carried out at a regional scale and have involved many communities, much gendered mapping research is focused at the household level, since this is often the scale at which women operate and the arena within which gender relations are negotiated.

My own research approach combines elements of both frameworks. During the fieldwork session, I hired and trained Wapichan women from Aishara Ton as local investigators in an attempt to move beyond earlier PM initiatives – which have tended to privilege men as local researchers – and existing approaches to gendered resource mapping – which have tended to limit women's participation to the creation of informal

maps. This was done in a manner that aimed to avoid creating or exacerbating divisions between women and men in the community. The sole use of a feminist-based approach would necessitate the exposure of unequal power dimensions between women and men in relation to access and use rights to natural resources, and may have been more disruptive than productive in terms of contributing more generally to existing community-based initiatives. Valuing broader community-level cohesion was considered a high priority; therefore I developed a modified PM methodology that draws from ideas put forth by feminist political ecologists, to carry out mapping with women based on the notion that they may have unique knowledges and perceptions of resource-based activities and access locations. I carried out mapping activities with women at the community scale to allow for a more general overview of the spatial patterns of women's natural resource use, and at the household scale to assess micro-level variations in these broader patterns (e.g., according to age, household structure). Thus, the new information gathered alongside local female investigators can add to community-scale maps and contribute to this broader-level project, while simultaneously recognizing gendered differences in natural resource use patterns within and amongst households, to make clear the importance of including women's geographies and geographical knowledge in PM processes.

2.5 Concluding Statements

Across Latin America, PM initiatives are being undertaken by indigenous peoples, who are creating counter-maps that represent the lands that they use and occupy, and that are being produced for a variety of purposes. Although these maps continue to

be used mainly for negotiating and validating indigenous land claims, many are also being used to develop resource management plans founded on local priorities and perceptions of the landscape. Based on the ideas put forth by advocates of community-based natural resource management and feminist political ecologists, development and conservation initiatives – whether driven by local, national or international groups – must take into consideration the power dimensions and politics of difference within communities. To achieve the most equitable and sustainable outcomes over the long term, the multiplicity of perceptions, uses and priorities relating to the management of local lands and resources must be acknowledged and validated. In the production and use of community maps to support locally driven resource management initiatives, PM approaches can be implemented with a particular focus on using gender-sensitive techniques. This allows for women to be involved in the technical aspects of mapmaking and for their knowledges to be represented in the resulting texts, thus highlighting how landscapes are gendered, and contributing unique information about the uses of certain natural resources and various places of acquisition.

Chapter 3 – Contextual Background

State–Indigenous Relations, Counter-Mapping and Amerindian Women in Guyana

This chapter provides the contextual background for my research project and focuses on the following three overarching topics: the diverging development priorities of government agencies and indigenous peoples in Guyana, which have intensified the debate over Amerindian land and resource rights in recent years; the emergence of a pan-national indigenous movement that is closely linked to recent counter-mapping initiatives being undertaken by Amerindian communities across the country; and the increased recognition being given to women's empowerment and participation in local development initiatives. More specifically, the discussion of counter-mapping initiatives among indigenous communities in Guyana provides a foundation from which my own research stems and on which it builds. In addition, a dearth of literature and research relating to gender issues among Amerindian communities highlights the importance of the fieldwork process and the analysis presented in this thesis. This work is one of the first attempts at documenting the particular knowledge, experiences and perspectives of Amerindian women in relation to their local environment. It can therefore help to inform more equitable and sustainable development programs and policies in the future, while contributing to locally driven initiatives aimed at securing control over Amerindian lands and natural resources.

3.1 Amerindian Peoples in Guyana: Population Statistics and Demographics of the Study Area (Deep South, Region 9)

Guyana is the only English-speaking country in South America, and hosts a diverse range of landscapes and peoples. The country is divided into ten administrative regions, with Amerindian peoples currently making up the bulk of the population in the more remote areas of Regions 1, 2, 7, 8 and 9 (Figure 1.1). Nine Amerindian groups currently account for an estimated 60,000–80,000 persons, or approximately 8-10% of Guyana's total population (UNDP 1996; LaRose & MacKay 1999; Bishop 2005). About 21,000 Amerindian people inhabit Region 9 – also popularly known as the Rupununi – which is the study area for this research project. Three tribes reside in this region: the Makushi inhabit the mountainous areas in the north and the north-central savannahs, while the Wapichan populate the south savannahs and a single Wai Wai community is located near the Brazilian border in the south. Despite the Rupununi's relative isolation from the more populated and culturally distinct coastal areas, there has been a visible increase in the number of non-indigenous people moving into the region in recent years. This shifting demographic has occurred alongside the expansion of agricultural, extractive and development activities in Guyana's hinterland regions and has contributed to an intensified debate over Amerindian land and resource rights (Colchester 1997, 2005; Bishop 2005).

3.2 State-Indigenous Relations in Guyana: National Development Priorities, Conservationist Policies and Amerindian Land and Resource Rights

Since the mid-1980s, when economic reforms led to the privatization of previously nationalized industries (Hogg 1993), the Guyanese government has

Figure 1.1 Guyana: Regional Context, Administrative Regions and Study Area

increasingly focused on ‘development’ of the interior regions as a means of attracting foreign investment. In particular, the exploitation of Guyana’s natural resources – mostly through mining and logging operations – has become one of the main development priorities for the country, and revenue from these extractive activities has become integral to sustaining the national economy (GoG 2000). However, in many cases the land and resource rights of inhabitants of these resource-rich areas – who are mainly Amerindian peoples – are not given adequate consideration (Colchester 1997). Although numerous Amerindians are employed within these sectors, an increase in extractive activities is having a significant impact on the livelihoods of entire communities. These adverse effects span political (e.g., denial of land rights), economic (e.g., shifts in subsistence activities), social (e.g., increasing absence of male household members, shifting social values) and environmental (e.g., water pollution, depleted fish stocks, destruction of habitat) sectors (Forte 1996; Colchester, LaRose & James 2002). A lack of government response and capacity to control repeated incursions onto titled or claimed Amerindian lands has intensified the land rights debate in recent years (LaRose & MacKay 1999; Bishop 2005).¹⁴

Ironically, conflicts over land ownership and resource rights have been further exacerbated by efforts of the Guyanese government to mitigate the environmental impacts of mining and logging activities. In conjunction with international conservation

¹⁴ Based on a study carried out by the Amerindian Lands Commission (ALC 1969), 79 indigenous communities have been given some form of title since Guyana’s independence from British rule (1966), which represents only a fraction of the land area originally claimed by Amerindian tribes (Bishop 2005; UMADC, APA & FPP 2000). This leaves 40 Amerindian communities without any legal rights of ownership of or guarantees of tenure on their lands, and several of the villages and districts that do have some form of title are requesting extensions to ensure that enough land is available to support the livelihoods of future generations (LaRose & MacKay 1999).

organizations, the government identified several biodiversity 'hot spots' in the mid-1990s and put forth a proposal for the establishment of a national system of protected areas (Hoosein & Evans 1996). All of these proposed areas overlap to some degree with titled or claimed indigenous lands, and at a stakeholder meeting held in 1996 Amerindian leaders asserted that land rights must be addressed prior to implementation of the project (PCC, APA & MacKay 2000). Despite some modifications to the original proposal (GoG 2003), and although many of the country's indigenous peoples do not disagree in principle with the Western notion of conserving biodiversity, much conflict and contestation remain over the protected areas project because some feel it still fails to fully recognize and guarantee the rights of Amerindian peoples (LaRose & MacKay 1999; PCC, APA & MacKay 2000; LaRose 2004). This issue is further compounded by the fact that legislation relating to Amerindian land and resource rights within protected areas (i.e., the Environmental Protection Act of 1996) has not yet been approved, and thus protectionist regulations cannot be enforced (Bishop 2005).

While the government has made an attempt to move forward on indigenous land and resource issues in recent years, it has had limited success. For example, a national three-phase program relating to the demarcation, extension and negotiation of land claims was announced in 1997. Though this marked an important step by the government to begin dialogue on these issues, many Amerindians have remained skeptical of the phased approach and almost half of the titled areas have rejected it (Bishop 2005). Instead, 61 Amerindian communities in six of the country's ten regions have worked to produce detailed maps that represent their traditional occupation, as well as current land and

resource use within these areas. It is hoped that these maps will provide the basis for negotiations over land rights, although to date the Ministry of Amerindian Affairs has refused to recognize their legitimacy since they were not produced by, or in conjunction with, government agencies (Bishop 2005).

However, several communities are using these maps for their own purposes: to document local knowledge, to monitor changes in local environments and to develop resource management plans based on local customs, needs and development priorities (APA 2005). The undertaking of these mapping projects reflects an emerging indigenous movement that is becoming increasingly vociferous within the national political sphere. The principal objective of the indigenous movement is to “redefine prevailing political, legal, economic and cultural relations with the state and thereby to transcend four centuries of colonial domination and institutionalized racism that remain firmly entrenched in Guyanese law, policy and practice” (LaRose & MacKay 1999: 1).

3.3 The Indigenous Movement in Guyana: Shifting the Political Framework and (Re)Presenting Amerindian Territories

Throughout colonial and post-colonial history, indigenous peoples in Guyana have maintained distinct identities and have developed important political liaisons – with each other and with external organizations – in order to promote their rights (ALC 1969; Colchester 1997, 2005). Yet, until very recently Amerindian leadership has been excluded from state- and corporate-centred decision-making concerning national development schemes (Colchester 1997; LaRose & MacKay 1999; Colchester, LaRose & James 2002; Bishop 2005). After several years of lobbying by both national and

international organizations representing Amerindian interests, legislation pertaining to state-indigenous relations is in the process of being modified. This includes the negotiation of a revised draft of Guyana's Constitution, with new guarantees in place that aim to promote Amerindian rights and to create an Indigenous Peoples Commission (IPC) in order to implement them (Bishop 2005). The Amerindian Act of 1951 (amended in 1961 and 1976) – which is the main law defining state-indigenous relations in Guyana – has been strongly criticized for its colonial assumptions and for failing to uphold indigenous rights within constitutional and international laws (APA 1998; Hill 1999), and is in the process of being amended again (*Stabroek News* 2005).

The Amerindian Peoples Association (APA) is a national lobbying group that has played an integral part in these processes of political and legislative reform, and has had an active role in the formation and facilitation of the indigenous rights movement in Guyana. The APA was formed in 1991 to advocate for “the social, economic, political and cultural development of the Amerindian communities in solidarity with each other and to promote and defend their rights” (APA 2005).¹⁵ Much of the APA's work is carried out within the framework of constitutional and international laws and emphasizes how Amerindian peoples' rights are enshrined within agreements relating to human rights

¹⁵ The institutional structure and membership of the APA are based upon direct representation from rural Amerindian communities. A general assembly meets every two years and elects the executive committee, which includes at least one representative from each region. Members of the APA assembly represent units (i.e., of at least ten individuals and sometimes entire villages) from 70 communities nationwide, thus facilitating co-operation and consensus among the nine indigenous groups of Guyana (Colchester, LaRose & James 2002; Colchester 2005).

and sustainable development.¹⁶ Other initiatives are centred on the documentation of Amerindian occupation of traditional lands and indigenous knowledge relating to the natural environment, in an attempt to legitimize claims to land and resources and to show how Amerindian communities have been managing their resources sustainably for generations (APA 2005).¹⁷ In this regard the APA has facilitated several of the community mapping projects mentioned previously. A significant number of natural resource use locations, sites of cultural importance and land use trends have been mapped in detail, providing information about Amerindian areas that has never previously been recorded (James 2004a, 2004b; Colchester 2005).

This counter-mapping movement in Guyana began in 1996, when the APA worked alongside the UK-based Forest Peoples Program (FPP)¹⁸ and independent researchers to carry out a land use and occupancy study¹⁹ of the Upper Mazaruni area in the country's northwest (Colchester 2005; Poole 2005). This project was initiated in response to increased mining activity and incursion into indigenous lands and was based on the fact that official government maps of the area are flawed in their accuracy and

¹⁶ For example, one research project emphasizes how Amerindians' rights to free, prior and informed consent with regard to any proposed development on their territories are contained within international human rights instruments that have been ratified by the Guyanese government (see Colchester & MacKay 2004).

¹⁷ Another recent research project aims to highlight how traditional resource use practices of Amerindian groups relate to clauses in the Convention on Biological Diversity, which link traditional knowledge of biological resources with sustainable conservation management (Dempsey & Winter 2005; Griffiths 2003).

¹⁸ The FPP is an organization that focuses on promoting the rights of forest peoples to control their own land and resources (FPP 2005).

¹⁹ The framework for carrying out land use and occupancy studies originated among First Nations communities in Northern Canada in the mid-1970s and has since been modified and implemented worldwide by numerous indigenous groups (Chapin, Lamb & Threlkeld 2005; Kemp & Brooke 1995; Rundstrom 1991).

inconsistent in their content (Copeland & Forcese 1994).²⁰ When erroneous maps are used for mineral or timber surveys, or if mistakes are replicated in the delineation or demarcation process of land titling, Amerindian interests can be compromised (Copeland & Forcese 1994; Bishop 2005). The maps resulting from the Upper Mazaruni project are currently being used in the first land claims lawsuit in Guyanese history, and the outcome will likely have important implications for the status of aboriginal title in national law (Bishop 2005).

This original project sparked the interest of several Amerindian communities in mapping out indigenous territories from their own perspectives. Local residents are trained as technicians by external experts (e.g., representatives from the APA and/or the FPP) and then work independently as a team to collect data and carry out fieldwork. External assistance is then utilized to help in entering field data into computers and to generate digital maps (Colchester 2005; Poole 2005).²¹ As with other participatory mapping (PM) projects that have been carried out in Latin America, few women have been involved in these projects beyond community-wide consultations and the production of informal sketch maps (James 2004a). However, women's participation – and the utilization of their unique knowledges, experiences and priorities – are increasingly being

²⁰ A report on the errors and oversights on official government maps of Amerindian lands points out that incorrect maps are problematic when concessions are granted to national and international corporations, as boundaries of titled areas are unclear or differ among government ministries (Copeland & Forcese 1994).

²¹ Similar mapping projects have also been undertaken by communities in Region 9 through the North Rupununi District Development Board (a representative body for Amerindian communities in the north Rupununi) and Iwokrama (a protected area and research centre adjacent to these communities, with a central mission to promote the conservation and sustainable use of forest products in order to support long-term ecological, economic and social development in the area) (Approo 2001; Social Science Unit 2002).

sought by government agencies, development organizations and Amerindian groups in Guyana.

3.4 Recognizing the Role of Amerindian Women in Local Development Initiatives: Engaging Their Participation, Valuing Their Knowledge, Mapping Their Spaces

The economic, social and political structures of Amerindian villages in the Rupununi have shifted significantly within recent years (Watkins 1998b; Bishop 2005) and these shifts can be linked to the impacts of mining and logging activities (Colchester 1997, 2005), as well as to the increased presence of government agencies and non-governmental organizations (NGOs) in the interior (Forte 1996; Forte 2000). Despite these changes, resource use remains an important facet of the Amerindian economy and lifestyle, and agricultural practices continue to be a definitive aspect of indigenous identity (Forte 1996). Amerindian women have been particularly affected by altered economic and social arrangements, since their agricultural and domestic responsibilities have intensified as men increasingly leave their villages to seek waged labour opportunities (ARU 1993a, 1993b; Forte & Pierre 1994; Bishop 2005).

As indicated in a report relating to gender issues in Guyana's interior, Amerindian women are at a disadvantage because they are both indigenous and women and thus face a 'dual reality.' This same report describes the position of Amerindian women as "the poorest, most vulnerable and marginalized of all groups in Guyana" (Watkins 1998b: 12). In response to this, more programs and policies are being geared towards empowering women, engaging Amerindian women's participation in decision-making structures and supporting the formation of women's groups (Forte 2000; GoG 2000; APA

2002; Mosley & Wilson 2003). Nevertheless, although some individuals have become more vocal in expressing their needs and concerns through village councils and newly formed women's groups, in general Amerindian women play a minimal role within political decision-making structures at local, regional and national levels (ARU 1993a; Watkins 1998a).

Despite this increased emphasis on the role of Amerindian women in community development initiatives, very little research on gender issues has been carried out and gender-disaggregated data for indigenous communities in Guyana remain limited (see only ARU 1993a; Forte & MRU 1996; Watkins 1998a, 1998b; APA 2002; Dilly 2003). This is problematic, since it is evident that development programs – whether driven by local, national or international institutions – have differing impacts on women and men:

In the Guyana Amazon there is a paucity of information available about gender differences. There is therefore a very urgent need to gather data that is gender segregated and that is designed to examine initially the roles of women in Guyana Amazon communities. Analyses of gender need to be designed so as to make monitoring of the changes in women's roles possible. Because of women's important roles in education, the home and the community, development programmes need to look at gender as a core for consideration (Watkins 1998a: 6).

With particular reference to the study area of my research project, one paper outlining the material culture of the Wapichan does briefly describe the different roles of women and men in certain community- and resource-based activities, but it does not provide a detailed or discrete gendered analysis (ARU 1989). A more recent study that

focuses on the documentation and analysis of Wapichan ethnoecology²² makes little distinction between women's and men's perceptions or knowledge of the local environment, but the author does recognize this as an important goal for future research:

Evidence of areas of ethnoecological knowledge in which women were more proficient than men did emerge during the course of the study...Both within the field of interest of this particular study, and especially more generally, the documentation of female-dominated areas of knowledge remains an important goal in the recording of Wapichan ethnoecology (Henfrey 2002: 153).

Few studies to date have focused on documenting the gendered knowledges and uses of local landscapes among Amerindian communities. Only one study – carried out in the mid-1990s in the northern part of Region 9 – highlights Amerindian women's ethnobiological knowledge, and represents one of the first participatory research approaches, involving local Makushi women as primary researchers (Forte & MRU 1996). The participatory resource mapping project that I carried out alongside women in Aishara Ton and the analysis that I present in this thesis thus are among the first attempts at understanding and documenting 'female-dominated areas of knowledge.' This information can contribute new insights to PM approaches, and to gender and resource management studies, as well as to locally based initiatives aimed at validating control over and management of land and resources.

²² Ethnoecology is a subset of 'indigenous knowledge' and can be defined as "indigenous perceptions of 'natural' divisions in the biological world and plant-animal-human relationships within each division" (Posey et al. 1984 in Henfrey 2002).

3.5 Concluding Statements

Diverging development and conservation priorities of the Guyanese government and representatives of Amerindian communities have intensified the debate over land and resource use rights in recent years. Although the government has made an attempt to move forward on these issues, their success has been limited and their policies have been criticized for failing to uphold the rights of Amerindian peoples. In response, members and supporters of the indigenous movement in Guyana have been working to document Amerindian land use and occupancy through community mapping processes. In all the mapping projects carried out thus far, trained teams of local men have worked mainly with male community members to document community boundaries, as well as historical and contemporary land and resource use patterns. While this information is extremely valuable and can be used to support land claims negotiations with external actors, additional perspectives on the local landscape need to be considered when focus shifts to using community maps for developing locally driven resource management plans. In particular, the direct participation of Amerindian women should be engaged and their environmental knowledge and resource use activities recorded, since they maintain unique relationships with, and perceptions of, local environments.

Chapter 4 – Study Area, Field Site and Research Methodology

This chapter presents an overview of the study area (Deep South, Rupununi) and field site (Aishara Ton Village), as well as the methodological approach and fieldwork activities undertaken for this project. An overview of the geographical setting around Aishara Ton Village is provided, and a description of economic, political, social and cultural institutions offers some contextualization for local lifestyles and livelihoods.²³ Fieldwork was carried out in Aishara Ton over the course of eight weeks from October to December 2004. In line with earlier participatory mapping (PM) approaches, it involved the training of five local Wapichan women in a variety of methods over the course of two and a half weeks. These women were involved in the implementation of research techniques for the duration of the field study. More specifically, research methods included a women's mapping workshop; field mapping with a global positioning system (GPS) unit; in-depth interviews; the collection of local toponyms; cross-checking and preliminary analysis of the data; and presentation of the research data at a final community meeting. As such, both qualitative and quantitative methods were employed, with a particular focus on gender analysis. These field activities and outcomes are summarized, and an overview of various techniques used for data analysis is provided. Finally, the limitations of the methodological framework are addressed. Overall, this chapter indicates that women can be involved directly in PM initiatives and can collect important detailed and reliable data about natural resource use patterns among local residents.

²³ For an overview of Wapichan material culture, see ARU (1989); for a detailed description of Wapichan cultural ecology, see Henfrey (2002).

4.1 The Field Site and Study Area: Aishara Ton Village, Deep South, Rupununi

Aishara Ton Village is located in the southern part of Region 9, which is formally known as the Upper Takutu-Upper Essequibo and more popularly referred to as the Rupununi, based on the fact that most of the region is covered by the Rupununi savannahs. The Rupununi is composed of 33 nucleated settlements, many with smaller satellite communities (i.e., hamlets) attached to/associated with them. The area is divided into five administrative sub-regions: the Deep South, South-Central, Central, North and South Pakaraimas (Forte 1996).²⁴ The Rupununi is roughly separated into north and south by the forested Kanuku Mountains, with the northern savannahs populated mostly by the Makushi, and the southern areas inhabited almost exclusively by the Wapichan (Figure 4.1).

Historical documents place the arrival of the Wapichan in the area around the late eighteenth century. The Amerindian Lands Commission (ALC) report of 1969 states that the Wapichan settled in their present location around 1810, after migrating northwards from Brazil as part of a larger Arawak-speaking group (ALC 1969). By 1835 the Wapichan had driven earlier inhabitants of the southern savannahs further to the north (i.e., the Makushi) and to the south. By 1918, it was reported that the Wapichan had taken full possession of the southern savannahs and had integrated the remaining members of other tribes into their own group through intermarriage (Edwards & Gibson 1978). Current estimates put the total population of Wapichan peoples in Guyana at

²⁴ The Rupununi savannahs in Guyana are geologically associated with the Guiana Shield and cover an area of approximately 13,000 km², making up part of the larger Roraima-Rupununi savannahs, which extend into the northern state of Roraima in Brazil (Forte & Pierre 1994).

Figure 4.1 Major Rivers, Mountain Ranges and Wapichan Settlements in Region 9
(the Rupununi)

approximately 9,800 (Bishop 2005: 15), although this number varies because of the constant movement of individuals to/from their villages.

4.1.1 Biophysical Landscape in the Aishara Ton Area

In terms of the biophysical setting, Aishara Ton is located in the middle of the Rupununi savannahs, which stretch far to the north and west, whereas dense forested areas are located within 8-12 km south and east of the village. Continuous grass cover characterizes the savannahs, with some riparian forests growing along the banks of the numerous rivers, creeks and tributaries that traverse the landscape. Several bush islands and palm trees also grow around natural springs and swamps in the savannahs, segmenting it into pocketed areas – many of which have local Wapichan names. A few forested hills and mountains are also located throughout the area, some of which are used for agricultural purposes since the savannah soils are low in natural fertility and have a limited capacity to retain water (Forte & Pierre 1994).

The vegetation around the Aishara Ton area is dominated by a few herbaceous and woody species, which apart from the grass that covers much of the savannah (*Trachypogon plumosus*) commonly includes the *cayambi* or ‘sandpaper tree’ (*Curatella americana*), the cashew tree (*Anacardium microcarpum*), the etai palm (*Mauritia flexuosa*) and the cokerite palm (*Maximilliana regia*) (Eden 1970; Forte & Pierre 1994). Many of these wild grasses, plants and trees must be able to accommodate harsh conditions since lower areas of the savannahs are flooded for four months of the year during the rainy season (May-August), followed by a water deficit during the longer dry

season (October-April) when many grass fires occur.²⁵ Indeed, 75% of the annual rainfall – which is highly variable, averaging between 1,000 and 1,300 mm – occurs during the rainy season, with intermittent showers in December and January ('Christmas Rains') (ARU 1989).

Aishara Ton Village is nestled in the savannahs between three large rivers and their tributaries (Figure 4.2). The *Kabaun Wa'o* flows northwest into the Rupununi River (also called the *Roponan Wa'o* in Wapichan) and forms the northern 'border' of Aishara Ton. The *Maokaa Wa'o* flows north into the *Kabaun Wa'o* and passes through the western part of the village, whereas the *Bakapara Wa'o* - which also flows north into the *Kabaun Wa'o* - passes through the eastern part of the village. Churikidnao, a satellite community, is located north of the *Kabaun Wa'o* and between the *Chiida Wa'o* and the *Churikid Wa'o*, which lie north and south of the hamlet, respectively. Three mountains are located just south of the village – *Maridi Wa'o Tao* (Aishara Ton Mountain), *Marudu Kuo Tao* and *Katambaro* – and *Maokaa Tao* is located west of Aishara Ton.

Beyond the physical elements and practical uses of the surrounding environment, many Wapichan residents of Aishara Ton Village continue to attribute spiritual value to certain local landmarks (e.g., rocks, creeks, trees), and many stories are told about spirits that inhabit the area. Although many of the younger people know the stories and have

²⁵ In recent years, fluctuations in these seasonal variations have had a severe impact on the lives and livelihoods of local residents, who continue to rely heavily on the use of natural resources from the savannah and forest environments as a form of subsistence. An extended drought in 1997, for example, affected the production of cassava (the staple food) and caused widespread starvation throughout the area. More recently, in the fall of 2004 when I was carrying out fieldwork, an extended rainy season (i.e., an additional two months of rainfall) affected farming patterns, crop yields and transportation into the interior.

Figure 4.2 Major Rivers and Mountains in and around Aishara Ton Village

learned the appropriate rules of interaction with certain cultural features of the landscape, they do not seem to follow or respect them as strictly as older generations. Some of the elders in the village claim that these changing attitudes show a disrespect for the power of the spirits inhabiting the area, and draw on this to explain the resource shortages and shifts in the local environment that have become more noticeable in recent years.

4.1.2 Accessibility

The main road from Lethem (the regional headquarters), which is essentially an unpaved trail, runs straight through the centre of Aishara Ton. Access is difficult during the rainy season, when flooding frequently washes out the road and bridges at major river crossings. At this time, larger vehicles coming into the area damage the roads further, and at times only boats can be used to cross the flooded savannahs. The recent expansion of mining activities in the Marudi Mountains south of Aishara Ton has sparked discussions on improving the road in order to facilitate the transport of equipment and supplies into the area. During my fieldwork session in Aishara Ton, many comments were made about the increase in vehicular traffic through the area, ranging from large Bedford trucks (i.e., old British army vehicles) to smaller all-terrain vehicles.

4.1.3 Population Demographics of Aishara Ton Village

Aishara Ton is the largest village in the Deep South sub-region, and is located approximately 160 km south of Lethem. Churikidnao is located 10 km to the northeast of Aishara Ton's village centre and maintains links with Aishara Ton through participation in the Village Council. Aishara Ton (including Churikidnao) has an estimated population

of 1,200 mostly Wapichan people,²⁶ although, based on population estimates from a recent report on Amerindian communities in Guyana (Bishop 2005), the current population of Aishara Ton could be closer to 1,600. In a study carried out in 1993, the population of Aishara Ton (1,142 at the time) was broken down along ethnic lines as follows: 1,098 Wapichan, 4 Negroes, 15 Makushi, 5 Arawak, 18 Mixed and 2 East Indian (ARU 1993b). The village is divided into several districts, each with its own name, and several dirt trails connect the various homesteads and sectors of the community. According to a survey carried out by a community health worker in 2004, there are 239 households in Aishara Ton and Churikidnao combined. These households are somewhat spread out into the surrounding savannahs, although the majority of homesteads are close to the village centre, where most government buildings, schools, shops and the hospital are located. Some of the older members of the community live permanently in relatively isolated farm camps, coming to the village only to buy supplies or attend Christian church services.

4.1.4 Local Infrastructure, Political Structure and Cultural Institutions

As the sub-regional headquarters for the Deep South, Aishara Ton has a relatively well-developed infrastructure and is the centre for much political, cultural and economic activity. Local infrastructure includes the hospital, three schools, a police station,

²⁶ This number is approximate because there have been no official surveys carried out in Aishara Ton since a Social Conditions Study was conducted by the Amerindian Research Unit (ARU) in March 1993, which stated that Aishara Ton had a population of 1,142. During my fieldwork, both the *Toshao* and the community health worker stated that the current population of Aishara Ton is 1,200. However, this number is highly variable, due to the frequent movement of individuals to/from the village, based on seasonal work patterns and other factors, such as annual holidays.

government buildings, several churches and a vestry,²⁷ a community centre and storage building, a sports field, a library, a women's centre, an airstrip and six stores that sell various household goods, clothes and foodstuffs. As in other Amerindian communities, village affairs are facilitated by the Village Council, which is headed by the *Toshao* and is made up of 15 elected community members, of whom several were women at the time of the fieldwork. The Council members are elected every two years and meet once a month; meetings are held with all interested village members every three months. These village meetings are essentially a forum for public discussion and consensus-based decision-making. The Village Council also facilitates a longstanding tradition of community work every Monday, and villagers are provided with a hot meal and drinks in exchange for their day's labour. Representatives of the state-run Regional Development Council (RDC) live in the community, including a District Development Officer (DDO) and a Community Development Officer (CDO). Other organizations that function at the village level include a parent-teacher association, a sports club, women's groups and a Wapichan literacy group.

Both Wapichan and English are spoken in Aishara Ton, as well as some Portuguese. The official language of instruction in the schools is English, although a curriculum that focuses on revitalizing Wapichan language and cultural identity has been integrated into local school programs in recent years. The headmaster of the secondary

²⁷ There are seven churches in Aishara Ton, although the Catholic Church has been established in the area for the longest period (since 1945) and maintains the largest congregation.

school is currently facilitating a Wapichan literacy project,²⁸ and some trained language experts from the village are also working to standardize the spelling of Wapichan words. One of these local experts was involved with my research project and reviewed the orthography of the Wapichan names, describing various natural resources, resource acquisition sites and features of the landscape, that were collected with local women. In their homes, most people communicate in Wapichan, and the majority of the elderly people who did not attend school do not speak any English. This therefore necessitated the use of translators (i.e., local investigators) during most of the interviews carried out during the fieldwork session.

4.1.5 Local Economic Activities and Women's Groups

As with most Amerindian communities in the Rupununi, the majority of people in Aishara Ton carry out shifting (i.e., rotational) agriculture for subsistence purposes. Many households cultivate farms in clearings that are cut in primary and secondary forests, close to the forest edge (i.e., 'bush mouth'), and these places are accessed by a network of rough trails or 'farm roads.'²⁹ Some families also maintain house gardens that are located closer to their homesteads. However, most of the farming areas are located between 8 and 12 km south (southeast and southwest) of the community, although residents of Churikidnao farm in areas to the north and northeast. People travel to their farming areas by various modes of transportation, and therefore the time spent traveling

²⁸ The Wapichan Wadauniinao Ati'o (WWA) is a regional literacy project being carried out in the Deep South. Representatives from each of the six Wapichan villages meet regularly in San Jose, near Lethem, to work on a dictionary of Wapichan that will follow up an earlier publication of Wapichan terminology. However, the recent murder of the Canadian missionaries who were facilitating this project and the destruction of their homestead will likely impact the future outcome of this project.

²⁹ Extended families tend to farm in the same general areas (i.e., along the same farm roads).

to farms ranges from one to five hours (walking), or from 15 minutes to an hour and a half (riding a bicycle). On average, new farms are cleared and burned annually during the dry season (October-April) and fields are planted throughout the rainy season (May-August). The standard size of farms is one acre, although some families alternate the size of their farms each year so that they can maintain and harvest provisions from both fallow and newly cut areas. Most families build temporary homesteads ('farm camps') near to their farming places, where they store provisions and process cassava,³⁰ many families stay in these camps on weekends and during the August school holidays. Apart from numerous varieties of bitter cassava – the staple food crop for all families in Aishara Ton – other tubers like sweet potatoes and eddoes are grown on most farms, as well as plants such as corn, pumpkin, papaya, bananas, sugarcane, watermelon, rice and peanuts.³¹

Aishara Ton's economy is 'mixed' in that farm products are being increasingly supplemented by imported foodstuffs, although subsistence agriculture remains a central aspect of the local economy. Some of the income-based activities that take place in Aishara Ton include peanut farming, small-scale mining in the nearby Marudi Mountains, and casual wage labour (e.g., construction and road building for government contracts). Several women in Aishara Ton also make snacks to sell to school children,

³⁰ There are various stages in processing raw cassava ('bitter' and 'sweet' varieties) into edible products: once cassava is harvested and transported from the farm, it must be scraped, grated and strained of its poisonous juices (i.e., bitter cassava contains lethal levels of cyanide) before being parched into *farina*, sifted and baked into cassava bread, or further processed into other products such as tapioca, *casareep* and *kari*.

³¹ See ARU (1989) and Forte (1996) for a more detailed description of Amerindian/Wapichan farming practices.

run catering businesses for visitors and sew clothes and school uniforms. Some of these activities are carried out independently by individuals, and some of them are facilitated through local women's groups.

There are currently two active women's groups in Aishara Ton – the Wadapapan Women's Group and the Aishara Ton Development Group³² – which carry out similar activities (e.g., sewing, catering), although they rarely coordinate or cooperate with one another. Both leaders of these women's groups sit on the Village Council and are active and vocal members within community decision-making and local development projects. My research project was discussed and endorsed by these female leaders, and they responded positively to the opportunity for local women to be employed and trained as local investigators.

4.1.6 Land Title, Land Claims and Local Resource Development

Aishara Ton has legal title over 430 km² of land, although there is currently a push for the expansion of this area on the basis of an original joint claim put forth by all six Wapichan communities of the Deep South in 1969, during the Amerindian Lands Commission survey (ALC 1969).³³ All land in Aishara Ton is held communally by the

³² During the fieldwork session, the *Toshao's* wife was in the process of forming a third women's group in an attempt to unify women in the village. She wants to start working with women in the community to educate them about the potential impacts of mining and to try and get them mobilized as a cohesive group.

³³ This is being facilitated by the Deep South *Toshaos* Council and would see existing title for the six Wapichan communities of the area extended in order to join all indigenous-owned lands into one contiguous area. Current land titles essentially create small islands of Amerindian lands that are surrounded by state-controlled areas, which can easily lead to encroachment into indigenous areas when mining and timber concessions are granted close to titled or claimed lands (ARU 1993b).

village and is administered through the Village Council. Land cannot be sold to or exchanged with outsiders (although houses can be sold between villagers), and people must apply through the Village Council if they want to construct a new home. Any individual or group wanting to carry out work or move into the village must also get permission through the Council.

Two current initiatives in the Deep South in particular have sparked discussion about local land and resource rights. A Canadian-based mining company – Vanessa Ventures Limited³⁴ – recently received permission from Guyana’s Environmental Protection Agency (EPA) to start operations in the Marudi Mountain Gold Mine, located south of Aishara Ton. Despite claims made in the company’s environmental impact assessment (EIA) that the mining and processing activities will not involve harmful or chemical substances (*Stabroek News* 2004), the area where operations will take place overlaps with traditional resource use sites, and there is some concern about the impact that larger-scale mining activities could have on local fish populations and water quality. This has caused some tension among villagers due to varying levels of support and opposition for this endeavour.³⁵ A second initiative is focused on the establishment of a ‘Wai Wai Protected Area,’ also south of Aishara Ton. The process of consultation for this project, which is being facilitated by an international conservation agency, has caused significant conflict both within and between Wai Wai and Wapichan communities

³⁴ Operations in Guyana are coordinated through Romanex Guyana International, which is a subsidiary of Vanessa Ventures Ltd.

³⁵ Despite support from the majority of village members for the increase in mining activities in the area, some village leaders and local community members are concerned that many people remain uninformed about the short- and long-term impacts of these operations, and also oppose the expansion of mining into the area until land and resource rights have been adequately addressed by the government.

in the Deep South (Siegel 2003). Although the protected area does not overlap with current land title held by Aishara Ton residents, the proposed joint land claim being put forth by Wapichan leaders does include this area. Some community members are thus concerned that the establishment of a conservation zone in an area where land claims remain unresolved could affect their resource use and ownership rights.

It is becoming increasingly evident that local resource use patterns and microenvironments are changing: resource stocks are being depleted in some areas, and landscapes are being altered. Residents of the area are therefore not averse to the concept of formalized resource management schemes, yet they wonder why conservation zones would be established on lands that have been managed by local indigenous populations for generations without involving them as (co-)owners or (co-)managers of proposed protected areas. For many of these reasons, the Deep South *Toshaos* Council has decided to develop a district-wide resource management plan. The information gathered through community mapping projects in the area will contribute to this planning process, which aims to demonstrate historical occupancy and the ability of local peoples to manage their own lands.

4.1.7 Community Mapping Projects in the Deep South

Individuals from the Deep South were trained by members of the Amerindian Peoples Association (APA) to form a mapping team, which spent three weeks in each of the six Wapichan communities to document how local people use and occupy the area. Individuals with specific knowledge about particular geographical areas, resource-based

activities or other features of the landscape were selected by each community to accompany the mapping team to document locations with a GPS unit. All of the individuals involved in this project were men, which was partly due to the fact that the objective of making these maps was to document indigenous occupancy in the area (i.e., the extent and boundaries of resource use), and it is men who tend to travel further from the villages. In Aishara Ton in 2003, the locations and areas in which certain resource-based activities are carried out were documented, as well as landscape features that included old homesteads, bush camps, burial grounds, rock carvings and other sites of cultural or spiritual significance (James 2004b). The information gathered was then taken to the APA office in Georgetown and transferred into a geographic information system (GIS) for the data to be analyzed and conventional, standardized maps produced.³⁶ The fieldwork for this thesis – whose methods are described below – therefore uses these 2003 maps as a basis for exploring the gendered dimensions of natural resource use in Aishara Ton, and also builds on these earlier initiatives by adding detail to existing maps that represents the particular knowledge and resource use patterns of several Wapichan women.

4.2 Research Methodology and Data Collection: Implementing Participatory Mapping Methods and Gender-Sensitive Techniques in Aishara Ton

The methodological approach used for this study builds on a local mapping project that had already been locally initiated and on other PM projects undertaken

³⁶ Topographic maps (1:50 000) were purchased from the Ministry of Lands and Surveys and scanned into the computer. A member of the APA mapping team then used these base maps to digitize all of the rivers and water systems for each map, in order to create simplified base maps on which resource use locations could be represented (James 2004b).

elsewhere. A variety of PM case studies were analyzed – ranging from mapping indigenous land use patterns for the purpose of legalizing rights to land (Herlihy & Leake 1997), to using PM techniques to come up with community-approved land use zoning systems (Herlihy 2001), to documenting hunting activities and the impacts of indigenous resource use on local wildlife populations (Smith 2003) – to provide more information about these earlier approaches. In all these projects, local investigators worked in conjunction with participatory researchers and technical teams, and were involved in a variety of research activities. Other commonalities exist among the PM projects that were assessed: they have all involved numerous communities (i.e., regional in scope), were often facilitated and carried out by research teams and technical advisors (e.g., cartographers, surveyors), and have involved the collection of census data and mapping fieldwork over the course of several months or years (Herlihy & Leake 1997; Chapin & Threlkeld 2001; Herlihy 2001, 2003; Herlihy & Knapp 2003; Smith 2003; Stocks 2003).

Due to time and budgetary constraints and the task of coordinating fieldwork as an individual, the scope of my own project was more modest. One community (Aishara Ton) was chosen as the field site; under my direction, the research team was made up primarily of local female investigators who had no previous experience in mapping or carrying out research; and the fieldwork season was limited to eight weeks. My methodological approach also differs slightly from those of earlier PM projects because it emphasizes the use of qualitative methods – such as semi-structured interviews and focus groups - to document women's geographies and geographical knowledge of the local area. Sketch mapping was carried out at two scales: several women worked together

initially to create community maps representing their natural resource use; this was followed by mapping sessions with individual women to gain insight into how gendered resource use and spatial patterns of resource use differ within/among households. Some of this information was then mapped out using GPS units and topographic base maps. In this way, qualitative and quantitative methods were combined, with a particular focus on gender analysis.

Before outlining the various stages of fieldwork activities, it is important to address the fact that this study is presented as ‘gendered analysis,’ yet only women were directly involved in the research process. Based on the fact that men had been employed and trained during earlier mapping projects, I decided to hire female investigators and to work specifically with women in documenting their particular knowledge and resource use patterns as a way of supplementing previous mapping work in Aishara Ton.

4.2.1 Fieldwork Preparation, Ethical Considerations and Community Consultation

In the months leading up to the fieldwork session (May-August 2004), many organizational activities were undertaken in Canada, including the review and approval of my research plan by the Carleton University Ethics Board. Another important element of pre-fieldwork preparation was to make contact with the community that had been chosen as a potential research site to explain my objectives and methods, and to seek permission from the Village Council. Aishara Ton was chosen as a potential research site through consultation with representatives of the APA, whom I met with at a conference on

indigenous mapping in Vancouver, Canada in March 2004. The research was approved by community consensus through Aishara Ton's Village Council in August.

Upon arrival in Guyana at the beginning of September, I immediately had a meeting with members of the APA to discuss the research proposal, and to find out whether permission was needed to travel and work in the interior.³⁷ At this time, I discovered that permits would be required through both the EPA and the Ministry of Amerindian Affairs, and that both processes could take several months. I submitted a proposal to the EPA and completed the appropriate documentation at the Ministry to get permission to travel into an Amerindian area. During the three weeks that this took, I undertook archival research in various library collections in Georgetown, including the National Library, the ARU library at the University of Guyana, the National Archives, the Walter Roth Museum of Anthropology, the APA resource centre and the Iwokrama resource library. At this time, I also purchased 1:50 000 topographic maps of the study area from the Ministry of Lands and Surveys and held informal interviews with representatives from the APA's mapping unit in order to get a more detailed description of the earlier mapping projects.

After four days of traveling by bus, truck, boat and tractor, I arrived in Aishara Ton Village on October 9, 2004 and was offered accommodation in the *Toshao's* compound. I presented my research to community members at a regularly scheduled quarterly meeting two days later, where I introduced myself and explained the objectives,

³⁷ Prior to my departure for Guyana, I also inquired about research permits through the Guyanese Consulate in Ottawa and through the EPA in Georgetown, and was informed that no permits were required.

research questions and rationale for carrying out the work. I also explained that the research plan had been developed in conjunction with representatives of the Village Council and that they fully supported the plan and approach. I emphasized the importance of the research for the entire community, in that the information gathered with women would add to the maps already produced by men, and the documentation of local environmental knowledge could be used for various purposes in the future. We agreed that we would co-own all of the data collected. I also announced that two local women would be hired and trained as local investigators and that interviews would take place over the next two days. Finally, I established the date, time and location for the first women's mapping session. The *Toshao* translated this presentation into Wapichan, and most comments/feedback and discussion with the community were also conducted in this language.

4.2.2 Selection Process and Training Workshops with Local Investigators

Interviews for local investigators began immediately after the first community meeting and continued for two days. I interviewed five individuals about their abilities and experiences, such as: level of education, reading and writing skills, Wapichan literacy, previous workshop experience, public speaking experience, involvement with the wider community, interest in environmental issues, knowledge of the surrounding area and availability.

After completing all the interviews, I decided that it would be most advantageous to hire all the interested women, as they were of different ages (ranging from 17 to 35),

farmed in different areas around the village, were involved in different aspects of community life and had particular skills that could benefit the research process. This proposal was approved by the five women and later by the Village Council, and candidates signed contract agreements outlining expectations and responsibilities. The only concern expressed by the Council at this time related to the ages of the local investigators: it was thought that elders involved with the research might not be comfortable since all the women were young and relatively inexperienced in bush life. It was decided, however, that this was a good opportunity for youth to gain important skills and training without having to leave the village, and that it was only younger people who had time to devote to the project. The age difference ended up being an advantage in that some of the younger women came to realize the breadth and depth of knowledge held by elderly women in the village, and became interested in carrying on the documentation of elderly women's skills and experiences beyond the time frame of this research project.

I began official training sessions for the local investigators soon after the interviews were completed, and these were carried out in four days over the course of two and a half weeks, although the women's skills and understanding of the methods used for gathering data continued to develop over time.³⁸ Six training sessions ranged from an overview of the basics of maps, mapmaking and community mapping to the more practical skills of using a GPS, reading topographic maps, facilitating workshops and translating interviews. We also discussed local gender roles and resource use in and

³⁸ Many aspects of the training were drawn from a publication called the Community Mapping Handbook: Mapping Our Land – A Guide to Making Maps of Our Own Communities & Traditional Lands (Flavelle 2002).

around the community (Appendix A). These sessions were designed to be participatory and the local investigators provided some feedback on the process and insight into the design of the women's mapping workshop, but at times it was difficult to get them to engage in discussion, to voice their opinions and to participate actively in decision-making. All the local investigators had other parenting or community responsibilities or commitments that had to be incorporated into the training schedule and work plan. Also, some of the women were more interested in certain aspects of the research, or were reluctant or unable to travel very far from the village centre to work on the GPS mapping aspect of the research. For this reason, during the first training session we agreed upon a weekly work schedule and decided that fieldwork would be carried out as a group on Monday and Thursday afternoons, and all day on Wednesdays and Fridays.

After the first month of training and fieldwork activities, the *Toshao* and two representatives from the Village Council facilitated a feedback session, where some misconceptions about the research and some interpersonal conflict among the local investigators were addressed. We all spoke about our experiences and perceptions and commented on the research process thus far. This meeting helped in clarifying the objectives of the research and the outcome was generally positive, as each woman recounted how much she had learned from the process thus far, and we discussed several potential options for ways of using the skills gained and information gathered in the future. Additionally, the Village Council requested that each local investigator write a report for the village records, explaining her involvement with the project.

4.2.3 *Women's Mapping Workshop and GPS Fieldwork*

A) Women's Mapping Workshop: Documenting Women's Resource Use Sites

A widely promoted one-day women's mapping workshop was held on October 22 and both women and men were invited to participate.³⁹ Several conflicting events on the day of the workshop may have affected the overall turnout,⁴⁰ although 23 women and one man arrived to participate. The ages of the participants ranged from 18 to over 55 years, with the majority of the women being middle-aged (30-55 years). All participants were from Aishara Ton Village and none were from the satellite community of Churikidnao. The morning consisted of a series of short presentations in English and, at times, in Wapichan by each of the local investigators on topics such as what a map is, what PM entails, and the importance of involving women in community mapping projects. The presentations were generally well received and generated some interesting discussion centred on the exploration of gender roles and the classification of responsibilities and resource-based activities into gendered categories.

The afternoon session focused on the creation of sketch maps representing women's resource use locations in and around the community. Participants were divided into three groups, each of which focused on a particular resource use category –

³⁹ Each of the local investigators took responsibility for sending announcements to the local churches a week prior to the meeting; several posters were drawn and put up in prominent areas around the village; messages were sent to the various women's groups and church groups; and information was spread to neighbours and friends by word of mouth.

⁴⁰ Among other events, a sports day for secondary school students was planned for the same day as the women's mapping workshop, which may have meant that parents attended the sports events rather than the workshop. This also necessitated a change in venue from the community centre, which is located beside the sports field, to a *benab* (i.e., open-air structure) in the *Toshao's* compound to minimize distractions.

agricultural resources, water-based resources and bush-/craft-related resources. The local investigators developed these categories during a training session on the basis of their own discussion of women's responsibilities and activities. They began by soliciting place names where various resource-based activities take place, and then helped in drawing these places onto sketch maps, on blank paper using coloured pencils and markers.⁴¹ Each of the groups worked in a slightly different manner. The women working on the water-based resources map, for example, participated relatively equally in drawing the rivers and place names on their map. They also decided to change the symbols that their facilitator had suggested. The group working on the bush-/craft-related resources map preferred to instruct the facilitators in where to draw rivers and locate resource use areas. A great deal of time was taken up in trying to figure out the spelling of place names, since few women could read or write Wapichan. This mapping exercise lasted for over three hours, and participants were extremely engaged in the overall process.

At the end of the day, representatives from each group presented their sketch map to the rest of the participants, explaining the places that they had documented and the process that they had used to achieve this. Participants were very proud of their maps and explained them in great detail. Many of the women, however, mentioned that some areas had yet to be documented, and that they would have liked more time to work on their maps and move between mapping stations, as originally planned. Finally, everyone was asked to give some feedback before leaving. Many participants indicated their

⁴¹ At this time, one local investigator was asked to focus on group facilitation, while the other was asked to take detailed notes of the mapmaking process.

interest in attending another workshop, and commented on the fact that this was the first time that women had been invited to share and document their particular knowledge of the area. Later, a quick debriefing session was held with the local investigators, who felt that the workshop had been successful and who had enjoyed the experience of practicing their public speaking and group facilitation skills.

B) GPS Fieldwork: Mapping Data in the Field

After the first women's mapping workshop had been carried out and the training sessions for the local investigators completed, the process of collecting GPS data began. As women tend to travel mostly between their homes and their farms, they have limited knowledge of other areas around the village. Each of the local investigators farms in a different area, which allowed them to take turns acting as field guides and showing myself and the other women different parts of the surrounding area.

GPS mapping focused on water-based resource use activities, since they clearly represented a distinctive use of resources in the areas surrounding the community. A GPS unit was used to obtain the geographical coordinates of the washing, bathing, fishing and water collection spots that were listed by participants during the workshop, as well as some additional spots. This collection of field data was carried out twice a week on average, over the course of three weeks. The local investigators and I spent long days out in the savannahs, traveling on bicycles to different parts of the surrounding landscape to collect the GPS information. During these outings, I acted as an overseer, while the local investigators practiced using the GPS and writing out field notes. With the use of a coded

system, waypoints were documented for each location, and the feature name, coordinates and a description of the particular area were recorded (see Appendix B). In total, 35 washing/bathing/fishing spots and seven natural springs ('blue pools') used for water collection were documented. This information was then transferred onto base topographic maps, which were also used for recording local toponyms (see section 4.2.4, below). During these mapping excursions, many stories were told about sacred and spiritual elements of the land (e.g., rocks, mountains, trees and creeks that are home to powerful spirits). In many ways, these more informal interactions were the most informative part of the process: the discussions helped to explain some of the more subtle perceptions of land and resources that are held by many people in the village.

Initially, there was confusion among the local investigators about what types of places we were trying to map, and it was difficult for me to understand how to differentiate between water-based activities and explain this clearly to them. However, it eventually became clear that many of the activities overlap in terms of where they are carried out, and separating them into distinct categories was confusing for the local investigators.⁴² For example, although a certain spot along a river may be used mostly for washing and bathing during the rainy season, it may double as a fishing spot during the dry season. The water springs, however, were considered a separate category because they are filled with clear, cool water year-round. There was also much discussion and debate over the extent and detail of our mapping. It became clear to me, for example,

⁴² This confusion was compounded by the fact that the specificity of resource use locations indicated by women on their sketch maps during the women's mapping workshop varied: some women named entire rivers as fishing areas, while others named specific spots along these rivers (usually deeper pools that do not dry out during the dry season).

through various conversations that a few additional places (e.g., blue pools) were located further away from the community or in hard-to-reach places. The local investigators, however, were reluctant to stray too far from the areas that they knew, or to go too deep into the bush, and it is likely that the existence of some water springs was deliberately not discussed with me for these very reasons. This does not have serious implications for the analysis of the field data, since this analysis is focused on women's activities in areas closer to the community.

4.2.4 Individual Interviews and Recording Local Toponyms

A) Individual Interviews with Local Women

Once field mapping was underway, individual interviews were carried out with 19 women to document their environmental knowledge and resource use. The main objective for carrying out these interviews was to discover intra-household and age-based differences in natural resource use. This was done by documenting – from various women's perspectives – how natural resource use is gendered, whether gender roles in the community are changing and how this may affect resource use, and how the availability of certain natural resources and frequency of use may have changed over time.

I developed an interview outline (Appendix C) and tested it with each local investigator, which allowed me to explain how the interviews would be carried out, as well as to gather information from these women as part of my field data. In addition, I was able to answer any questions and get feedback from the local investigators, so that

the interview questions and techniques could be refined and modified. Potential respondents were identified with the help of the local investigators, the *Toshao* and some members of the Village Council, and certain women were selected because of their perceived knowledge of, and experience in, the surrounding environment. We were able to identify women in three age categories: youth (17-29), middle-aged (30-59) and elderly (60+). However, there were notably more elderly women identified as potential participants, presumably because they are the ones who have had the most experience traveling into the deeper bush and have been the most dependent on natural resources to support their livelihoods.

Most of the interviews were facilitated by myself and two of the local investigators who had the best understanding of the goals and objectives of the research and who were able to communicate these clearly to other women. They were also the most reliable translators, and understood the importance of consistency, clarity and neutrality when carrying out the interviews. In general, interviews lasted between three and four hours, depending on the respondent's knowledge, frequency of use/access of natural resources and interest in the research project, and were usually carried out in the participant's home. We began each interview by explaining the research, discussing informed consent and answering any questions. We then moved on to a discussion of 18 different resource use activities, sorting them into gender categories (i.e., 'women's,' 'shared' and 'men's' activities) for that particular household, and documented which of these activities the interviewee carried out, as well as more detailed information about how resources are processed and used after being collected. Resource use locations were

recorded and guided a sketch mapping exercise to represent the respondent's resource use patterns (i.e., all the areas used over the woman's lifetime, or 'map biography'). The local investigators facilitated much of this process, including translation, and were particularly involved with helping women create their sketch maps. Some women asked the local investigator to draw the maps under their direction, whereas others wanted help in drawing the maps themselves. Later, this long process was facilitated by the use of pre-prepared base maps with the village and main rivers and mountains drawn in, although some of the women preferred to start with blank paper (Figures 4.3 and 4.4).

Because the interviews were so long, elderly respondents often became tired, and we had to return two or more times to complete these interviews. It became clear during the interview process that local investigators who are somewhat familiar with the surrounding areas are best able to help respondents map out their resource use in detail, and then accurately transfer that information onto topographic maps. This was one disadvantage of having hired younger women as the local investigators: many of them did not know areas other than those places where they farmed, which made it more difficult for them to facilitate the sketch mapping exercise with older women. However, their knowledge of the surrounding areas did increase considerably over the course of the research.

Figure 4.3 Sketch Map Representing Natural Resource Use of a 78 year-old Woman
(Using a Pre-Prepared Base Map; Drawn by Local Investigator)

Figure 4.4 Sketch Map Representing Natural Resource Use of a 34 year-old Woman
(Using Blank Paper; Drawn by Respondent)

B) Collecting Local Place Names: Adding Toponyms to Existing Topographic Maps

Once we had begun carrying out some of the individual interviews in the community, we quickly realized that we did not know the location of many of the places that were being named by respondents, which limited our ability to help with the creation of sketch maps. We therefore decided to work with women and men in the community who have extensive knowledge of particular areas around the village to document local Wapichan toponyms, for places such as rivers, creeks, mountains and old village sites. We began to bring the topographic maps to our interviews to add place names to the maps directly, or to double-check the toponyms that had been added earlier. After developing GPS mapping skills and working with maps, some of the local investigators became quite skilled in reading and explaining topographic maps to others and did most of the talking and translating during these sessions. The toponyms were written directly onto copies of the government topographic maps, which have very little detail about the local area and also contain some errors in the names of the few mountains and creeks that appear on them. Some of these toponyms were cross-checked with a GPS, and many of the places in proximity to the community and farming areas were also visited and toponyms confirmed.

If time had permitted and we had been able to travel greater distances, it may have made sense to start the entire mapping process by walking the land with local people (women and men) to add local place names to the topographic maps, and then to use these detailed base maps during subsequent fieldwork activities and interviews. However,

we were able to document several place names that had never previously been recorded, especially landmarks closer to the village centre. In the evenings, I would often go over my notes from individual interviews and fieldwork from the day and make lists of Wapichan terms for rivers, mountains and natural resources (e.g., particular species of fish, types of firewood, certain bush medicines, etc.) that had been discussed. During my last two weeks of fieldwork, I met four times with a local language expert in order to go through these lists and correctly spell more than 500 Wapichan words (Appendix D).

4.2.5 Second Community Workshop and Final Presentation

A) Community Workshop on Environmental Issues and Local Resource Management

A second four-hour workshop was held on November 24, a week before my departure, and focused on various resource-based activities. In particular discussion centered on perceived changes in the availability and frequency in collection of natural resources within recent years. My attempts to plan out this workshop in conjunction with the local investigators was not very successful due in part to differing levels of motivation and misconceptions about the objectives of the session. Despite the use of the same advertising techniques as those employed for the women's mapping workshop, only five individuals showed up to participate (three women and two men). Nevertheless, we had a productive discussion and carried out a preliminary analysis of our findings to date. The workshop ended up being more of a focus group, during which one of the local investigators would present a sketch map representing a particular natural resource category (i.e., each of the three maps created during the women's mapping workshop) and would then lead a discussion based on a related resource activity (e.g., fishing,

gathering firewood, collecting clay). We discussed eight resource-based activities in total, which participants felt were most relevant to the workshop. For each activity, we discussed whether gendered interactions with the requisite resources have shifted over time; whether there have been changes in resource availability and accessibility; whether younger people in the community continue to carry out the activity and how far they go to collect resources; and concerns about any changes and potential solutions to them.

B) Creating Draft Maps and the Final Presentation

A final community-wide presentation was held at the end of the fieldwork, in early December. In preparation for this, a full-day meeting was held with the local investigators to draft maps and to practice individual presentations. This included a manual transfer of the local toponyms onto the original topographic maps and a cross-checking of Wapichan spellings. A draft map representing the places traveled to during the three weeks of mapping fieldwork was created, with an associated list of the places. Finally, one of the sketch maps that had been drawn during an individual interview was enlarged and redrawn onto a poster-sized piece of paper, to give community members an example of what types of resources an individual woman may use during her lifetime, and where she travels to collect them. Some of these maps were left with the community and others were photocopied in Georgetown and returned to Aishara Ton through the APA, or photocopied in Canada and mailed back to each of the individual women involved with the research (e.g., the sketch maps produced by each woman interviewed).

Approximately 50 people attended the final presentation, including the Regional Chairman (i.e., the regional government representative), the *Toshao*, members of the Village Council and several of the women interviewed. There was a fairly equal female-male ratio. Each of the local investigators spoke for ten minutes about a particular aspect of the research that she had been involved with, some of the maps that had been produced during the fieldwork were presented, and I concluded by discussing some of the preliminary results and how this type of information could be used by the community. At this time, I also reiterated my intent to send back copies of the maps produced and the final report from Canada upon completion. The discussion was then opened up for feedback, and almost an hour was spent listening to the comments of individuals who had participated in the research to varying degrees. Much of this commentary was focused on the pride felt in the local investigators, who had given up their time to learn skills and document information that would benefit the entire community in the long term. Many comments revealed that this project was seen as the beginning of a process that could be taken forward in a variety of directions. This final meeting concluded with the presentation of certificates to each of the five local investigators and was followed by a community-wide celebration.

4.3 Process Outcomes, Data Sources and Analytical Techniques

Beyond the analysis that took place in the field – assessing the research process after each stage and going over field notes and interview transcripts in the evenings – I undertook a methodical analysis of the field data upon my return to Canada. It is important to note that each of the research activities carried out in Aishara Ton had

different purposes, including process outcomes, such as building trust and capacity among local investigators and participants, and data sources, such as sketch maps and interview transcripts (Table 4.1).

Table 4.1 A Summary of Field Research Activities, Process Outcomes and Data Sources

TIME PERIOD (2004)	FIELD RESEARCH ACTIVITIES	PROCESS OUTCOMES & DATA SOURCES
May–December	Community Consultation <ul style="list-style-type: none"> • Letter of intent • Two community meetings 	<ul style="list-style-type: none"> • Aligning priorities • Sharing information • Building trust • Establishing networks • Getting feedback
October 15– November 2	Training of Local Investigators <ul style="list-style-type: none"> • Training workshops • Feedback sessions • Ongoing supervision 	<ul style="list-style-type: none"> • Capacity-building • Facilitation skills • Mapping experience • Empowerment through participation
October 22 (One day)	Women's Mapping Workshop <ul style="list-style-type: none"> • Discussion of gender roles and natural resource use • Sketch mapping 	<ul style="list-style-type: none"> • Lists of gender roles/responsibilities and women's resource-based activities • Sketch maps (3) • Empowerment through participation
November (Ongoing)	Collecting Local Place Names <ul style="list-style-type: none"> • Interviews 	<ul style="list-style-type: none"> • 500+ Wapichan toponyms • Modified base maps
November 2 – 22 (15 days)	Individual Interviews <ul style="list-style-type: none"> • In-depth discussion of women's natural resource use • Sketch mapping 	<ul style="list-style-type: none"> • Interview transcripts (19) • Sketch maps (18)
November 3 – 23 (6 days)	GPS Fieldwork <ul style="list-style-type: none"> • Field mapping • Transfer of field data onto topographic maps • Informal discussion 	<ul style="list-style-type: none"> • GPS data • Field notes
November 24 (Half-day)	Community Workshop on Environmental Issues <ul style="list-style-type: none"> • Preliminary analysis of field data 	<ul style="list-style-type: none"> • Workshop notes
December 2 (Half-day)	Final Presentation <ul style="list-style-type: none"> • Draft maps • Individual presentations • Concluding ceremony 	<ul style="list-style-type: none"> • Draft map of GPS locations • Draft maps of local toponyms • Community feedback
Ongoing	Participant Observation	<ul style="list-style-type: none"> • Field notes

Although some of the process outcomes are touched upon throughout this chapter as a means of reflecting on the overall field research experience, most of the analysis presented in this thesis draws on the data sources, as outlined above (Table 4.1). Since my return from the field, this analysis has included integrating training notes, workshop lists and personal observations relating to gender roles and responsibilities, to produce a comprehensive overview of the gendered division of labour and gendered resource use patterns in Aishara Ton. I also produced a series of tables using interview transcripts, to provide an overview of the frequency and locations of resource acquisition, as well as details of processing techniques and various uses for each of the 18 natural resources discussed. These tables were differentiated by age and compared as such, to note any evident changes in resource use over women's lifetimes and to confirm observations made about this issue during informal discussions with local residents.

By combining the information from these tables with workshop notes, personal observations and published research relating to Amerindian lifestyles, material culture and natural resource use in the Rupununi, I was able to generate written summaries for each resource-based activity. From these, I drew general conclusions about how natural resource use patterns are gendered within the community, and how these gendered interactions relate to women's geographies in the area. I also noted commonalities and differences among respondents in their use of each natural resource (e.g., places of acquisition, frequency of collection, observed changes in the natural environment). Additionally, I used the sketch maps and interview transcripts as a basis for creating maps in a GIS (ArcGIS) showing general areas of women's resource use around farming

places, savannahs and forest areas near the community. I then compared these maps to the 2003 community maps to assess how women's geographies can add detail to these earlier documents. I also entered the GPS field data into a GIS to create standardized maps representing the spatial patterns of women's water-based resource activities. This was done to provide a visual representation of women's geographies in and around Aishara Ton Village. Finally, I compiled lists of Wapichan terminology and toponyms, which were returned to the community and cross-checked for accuracy.

4.4 Concluding Statements: Limitations of the Methodological Framework

There were several challenges in attempting to carry out intensive fieldwork within a limited time frame, using a participatory approach and within a cross-cultural setting. Some of them related more broadly to working in an isolated, rural and internally politicized community with minimal infrastructure. In addition, there was limited means of communicating with and garnering support from external advisors or researchers familiar with the area. Other challenges can be linked more directly to the methodological approach and were related to the fact that, in implementing participatory strategies, sufficient time is needed to build trust among the wider community as well as with local investigators to ensure optimal participation and support. In relation to this, it is also necessary to build in adequate time within the research framework to fully train and educate local investigators about the research objectives, methods and approach.

Many of the issues that arose with and among the local investigators in Aishara Ton can be linked to the fact that none of the women had previous experience in facilitating group discussions, conducting interviews or translating; only one woman had

ever learned the basics of reading and drawing maps; and all the women were under the age of 35, meaning that they had limited experience of the places that some older women talked about. My own inability to communicate in Wapichan heightened these challenges and meant that I was dependent on translators, especially for the in-depth interviews. This could have had implications for the validity and reliability of the data collected. However, by collaborating with two local investigators for the majority of the interviews, I was able to carry out these discussions with relative consistency. In addition, much of the information on gender roles, natural resource use patterns and place names was cross-checked with the local investigators and other community members; and additional GPS data were documented during field mapping to ensure the accuracy of certain toponyms. Finally, extensive field notes based on personal observations were taken, and more general information about the area was supported by the use of the few published articles on modern Wapichan material cultural (ARU 1989) and ethnoecological knowledge (Henfrey 2002). Despite certain limitations, the methodology described above demonstrates that it is possible to involve women directly in PM initiatives.

Chapter 5 – Analysis of Field Data

The Gendered Dimensions of Natural Resource Use in Aishara Ton Village

The analysis in this chapter is focused not only on the differences in the use of natural resources by women and men in Aishara Ton Village, but also on how men and women interact with resources in more subtle and complex ways. Both home-centred and resource-based activities are discussed and broken down into particular tasks to highlight three general patterns of gendered resource use. This allows for a more comprehensive understanding of how gendered patterns of use relate to gendered patterns of movement, especially in cases where women and men carry out the same resource-based activities but travel to different places. Additionally, there is diversity among women in terms of the types of natural resources they use and the places they travel to collect them, which can be broadly differentiated by household and generation. This analysis helps to illustrate the importance of including women directly in participatory mapping (PM) projects when particular natural resource use activities are being documented, on the basis that women's knowledge about, interactions with and perceptions of certain resources may differ from those of men. For the purposes of this thesis, the term 'natural resource use' encompasses the collection, preparation and consumption of a natural resource. The term 'natural resource use activity' indicates the act of carrying out particular tasks as they relate to specific natural resources, such as water, fish, fruits or medicinal plants.

5.1 An Overview of Gender Roles in Aishara Ton Village: Assessing the Gendered Dimensions of Home-Centred Responsibilities and Resource-Based Activities

During the training sessions for local investigators and the women's mapping workshop, participants were asked to consider how daily responsibilities and activities are divided along gender lines. Participants were thus asked to inventory and classify various responsibilities or activities as either women's, shared or men's activities, based on what they had experienced in their own lives and observed among other community members (Table 5.1).⁴³

Many of the home-centred activities – such as cooking, childcare, cassava processing, preparing drinks, tidying the house/yard, sewing, oil production and cotton work – were listed primarily as women's responsibilities. However, there was disagreement among participants as to whether some of these responsibilities would be more accurately placed in the shared category on the basis that some men – especially among the younger generation – now participate in home-centred activities more frequently. Thus, activities such as cooking, childcare and cassava processing were placed in both the 'women' and 'shared' columns. Conversely, a few of the elderly women (*kokos*) argued that activities such as water collection (e.g., for cooking, drinking, washing and soaking cassava) and gathering firewood should be placed in the 'women' rather than the 'shared' category, as they had always carried out these activities within their own households. Indeed, the categorization process and the ensuing debate among

⁴³ Table 5.1 is a composite of three tables created during two separate training sessions for local investigators and the women's mapping workshop. The responsibilities/activities presented in Table 5.1 do not necessarily appear in the same order as local women listed them, but rather are arranged in a format that allows for a clearer presentation of how they are gendered.

Table 5.1 Categorization of Responsibilities and Activities Carried Out by Women and Men in Aishara Ton Village

	Women	Shared	Men
Home-Centred Responsibilities			
Cooking	X	o	
Childcare	X	o	
Cassava Processing (i.e., scraping, grating, baking)	X	o	
Water Collection – Wells	o	X	
Preparing Drinks	X		
Tidying the House/Yard	X		
Sewing	X		
Oil Production	X		
Cotton Work	X		
Homestead Gardening		X	
Caring for Domestic Animals		X	
Agricultural Activities			
Farming – Cutting, Plowing			X
Farming – Burning, Clearing		X	
Farming – Planting, Cleaning, Weeding	X	o	
Farming – Harvesting	X	o	
Farming – Transporting Farm Produce	X	o	
Forest- and Savannah-Based Activities			
Gathering Firewood	o	X	
Jewellery Production	o	X	
Basketry/Craft Making		o	X
Gathering Forest Fruits		o	X
Medicinal Plant Use		o	X
Hunting			X
Making Bow & Arrows			X
Collecting Fish Poisons			X
Cutting Leaves (i.e., with bamboo poles)			X
Collecting Building Materials			X
Transporting Building Materials		X	
Making Weaving Frames (i.e., collecting wood)			X
Bleeding Balata			X
Water-Based Activities			
Water Collection – Rivers, Creeks, Springs	o	X	
Washing (i.e., clothes, wares)	X	o	
Fishing	X		X
Fishing Parties (i.e., poisoning ponds)		X	
Other			
Leadership Roles		o	X
Catering (e.g., selling snacks)	X		
Carpentry (i.e., furniture-making)			X
Vaqueros (i.e., tending cattle)			X
Transportation (e.g., vehicles, tractors, horses)			X
Mining			X

Note: 'X' indicates how a responsibility/activity was categorized overall and 'o' denotes duties that were contested in terms of their classification.

participants sparked discussion about how the gendered division of labour in Aishara Ton may differ between both households and generations.

These observations of shifting gender roles were supported by the comments of many women during their individual interviews, and in general it does seem that men are becoming more involved with activities that in the past were carried out almost exclusively by women and children. For example, one elderly woman explained that, when she was younger, her husband never helped her with chores like washing, collecting water or 'fetching load' (i.e., transporting produce) from the farm, but that now he helps her with these tasks. She has also noticed that some younger men in the community help their wives with this type of work more often. A similar observation was made during another interview: when people used to travel to and from their farming areas, men would carry only their bow and arrows, whereas women would carry their babies and the heavy loads in their *dopaawais*; today, however, it is more common to see men helping their wives to fetch various materials and farm produce, and for husband and wife to share more in these responsibilities. Other women pointed out that some husbands help their wives and children to gather firewood,⁴⁴ and a few men even help with cooking, cleaning, washing, and processing cassava (e.g., grating/scraping). One respondent commented on how these shifts in the gendered division of labour within the household can be related to the introduction of new technologies: her mother, for

⁴⁴ A few households in Aishara Ton use gas stoves for cooking, but most people still use firewood or coals.

example, used to scrape cassava by hand, but now that spinning (i.e., bicycle-powered) graters are available, more men are willing to help out with this aspect of cassava processing.

The gender boundaries for certain forest-, savannah- and water-based activities are similarly ambiguous. Apart from gathering firewood and washing, the classification of activities such as jewellery production, basketry (craft making), gathering forest fruits (to make into drinks), medicinal plant use and fulfilling leadership roles was debated. Some participants wanted these activities placed in the 'shared' column, arguing that certain women accompany their husbands into the deeper forest to help collect craft materials, as well as gather forest fruits and nuts. Also, it was pointed out that, while men tend to gather bush medicines from more distant forest areas, many women collect other medicinal plants from around the community and maintain a breadth of knowledge about their various uses. Finally, there is at least one female shopkeeper and several women on the Village Council in Aishara Ton, indicating that leadership roles are in fact shared somewhat between women and men. These disagreements and discrepancies are important to consider as they indicate that there may be more nuanced interactions between women and men when it comes to carrying out certain activities, rather than a distinct division of labour along gender lines.

In an attempt to further analyze how these gendered responsibilities/activities relate specifically to natural resource use among women and men in Aishara Ton, local

investigators were asked to identify the various resources associated with women's or shared activities (Table 5.2).⁴⁵

Table 5.2 Linking Women's and Shared Responsibilities/Activities with Natural Resource Use

WOMEN'S AND SHARED RESPONSIBILITIES/ACTIVITIES	ASSOCIATED NATURAL RESOURCE(S)
Cooking	Water, Firewood, Crops, Wild Foods
Cassava Processing	Cassava, Firewood, Wooden Graters
Water Collection	Water from Wells, Water from Rivers, Creeks, Springs
Preparing Drinks	Cassava, Fruits, Wild Fruits, Potatoes
Oil Production	Fruits, Nuts
Cotton Work	Cotton, Bone Spindles, Wooden Frames
Homestead Gardening	Soil, Seeds, Water
Farming	Soil, Seeds, Stems, Suckers, Vines
Gathering Firewood	Wood
Jewellery Production	Seeds, Feathers, Fish Bones, Cow Horn
Gathering Forest Fruits	Fruits
Medicinal Plant Use	Medicinal Plants
Basketry/Craft Making	<i>Mokoro, Tibi, Tibisiri</i> , Dyes
Washing	Water, Sandpaper (<i>cayambi</i>) Leaves, Sand
Fishing	Fish, Wooden Bows, Arrows Made of Plant Materials, Nets Made of Natural Fibres, Plant Poisons

Although the information provided in Table 5.2 broadly encompasses women's activities and the associated natural resources, it became clear during this session that not all of the raw materials are collected or processed by women. For example, oil production – which involves the extraction and processing of oils from various nuts gathered from around the community and from deeper in the forest – necessitates the labour, skills and knowledge of both women and men.⁴⁶ In this case, men often travel into the bush and climb trees to collect various nuts, and this activity is complemented by

⁴⁵ Activities that do not directly depend on the use of natural resources were not considered in this analysis.

⁴⁶ The most common oil currently being produced by women in Aishara Ton is made from coconuts, which can be collected from people's yards or around the community close to their homes.

the skills and knowledge of women, who process the nuts into oils (Appendix E).

Knowledge of oil processing techniques seems to be passed down from grandmother and mother to daughters through observation, and it is generally women who use these products as hair, skin or cooking oils.

Jewellery production is an activity that was shuffled back and forth between the ‘women’ and ‘shared’ categories during the workshop. This ambivalence can be related to the fact that it is often women who make jewellery (e.g., chains (necklaces), bands (bracelets) and laps (traditional skirts)) and decorate it. However, men sometimes cut down or climb certain trees to access seed pods, bore holes into the seeds, and bring back feathers and bones when they are out in the bush hunting and fishing. Sometimes children will also help to collect beads from farming areas and along riverbanks (Appendix F).

Farming provides another interesting example of the nuanced and gendered dimensions of resource-based activities. In general, it is considered a shared activity since both women and men are engaged in agriculture: they often work together to clear farms after they are burned, or they may share in the task of transplanting crop varieties from old farms. However, other duties within the broader activity of ‘farming’ are performed along more distinct gender lines: men tend to be more involved with the establishment of a new farm (e.g., cutting forest, burning, plowing) and women with the long-term maintenance of the farm (e.g., planting, weeding) and harvesting. It is important to note that women are to some extent dependent on male labour, since it is

men who do the heavier work involved with cutting and preparing agricultural areas for use. Therefore, the agricultural tasks carried out by women and men are simultaneously discrete, complementary, overlapping and, in some instances, inter-reliant. In this way, different labour inputs and expertise are required of both women and men to establish and maintain a farm.⁴⁷ One participant commented that, once a farm is established, women tend to spend more time there, and therefore she felt that they have a more extensive knowledge of the crops and techniques relating to agricultural activities. This confirms that knowledge of the local environment and the use of certain natural resources in/around Aishara Ton are gendered.

In the attempt to classify responsibilities/activities into discrete gendered categories, important interactions, complementary activities and overlapping practices can be overlooked. To counter this, a more in-depth look at how women and men interact with particular resources, in particular ways and places, is needed. Individual interviews were carried out in Aishara Ton to gather detailed information about the complexities of gendered interactions with certain natural resources. The information gathered from these interviews provides a foundation for examining how spatial patterns of natural resource use may also be influenced by gender, since women and men have unique perceptions of, interactions with and knowledge of their surrounding environment.

⁴⁷ This has been changing in recent years, as men increasingly travel from the village to mining areas and urban centres in Guyana and Brazil for long periods to seek out economic opportunities. This has had an impact on agricultural activities at the local level, as women are left without their husbands to cut and prepare new farms. One of the women interviewed has dealt with this problem by hiring a man in the community who owns a chainsaw to cut her a new farm while her husband is away in the mines; another woman gets her granddaughter's husband to cut her a farm, because her husband is too old and frail, but she still needs to plant the farm in order to sustain them both. Some women will also hold a *manorin* if they need heavy labour done on their farms.

5.2 Exploring the Complexities of Gendered Interactions with Natural Resources in Aishara Ton Village: From Collection to Consumption

During the individual interviews, each of the 19 respondents was asked to categorize 18 activities that relate to the use of natural resources, based on the division of labour within their own households and on their observations of other households. In addition to activities listed in Table 5.1, respondents also discussed pottery work, the utilization of water turtles and *tibisiri* basketry, which were included on the 2003 community maps.⁴⁸ Over the course of the interviews it again became clear that gendered differences exist in terms of who collects resources and who processes them, but in addition there are differences in who uses or consumes them. When these stages of use (i.e., collection, preparation, consumption) were discussed in detail, three general patterns of gendered resource use became apparent:

- (i) Either women or men are involved in all stages of use relating to a particular natural resource (i.e., discrete activities);
- (ii) Women and men are involved in different stages of use relating to the same natural resource (i.e., shared activities); and
- (iii) Both women and men are involved in all stages of use relating to the same natural resource, but at different times or in different places (i.e., common activities with discrete gendered temporal/spatial dimensions).

5.2.1 Discrete Natural Resource Use Activities

The first general pattern of gendered resource use implies that a particular activity may be considered a ‘women’s resource use activity’ or a ‘men’s resource use activity.’

For example, cotton is a natural resource that is collected, processed and used almost

⁴⁸ The 18 resource-based activities discussed during the interviews thus corresponded to the same natural resources mapped previously by men. This allowed a comparative analysis of spatial patterns and facilitated inclusion of these new data into existing databases.

solely by women.⁴⁹ Women plant cotton at their farms or in their gardens, pick and carry the cotton home, spin it into string and then use this to weave various items, such as hammocks or baby slings.⁵⁰ However, this work can be indirectly linked to the labour of men: many women use spindles made from the shells of river turtles, which are usually captured by men.

Another example of a women's resource use activity is pottery work. Clay is a natural resource that is used almost exclusively by women in Aishara Ton, and the associated knowledge and skills are passed on from older women (i.e., *oopaizo*, or clay potters) to younger women. It is mostly women who collect clay, make it into pots and other items, and then use these for processing food, cooking and storing water. One woman talked about how men are not supposed to help in collecting clay or they risk getting sick, and the pots made with this clay may crack when they are being baked. As such, there are certain rules governing the collection of clay, which are linked to the belief in a spiritual force (the clay *daru*, or father) that protects and owns the clay in all the creeks. In addition, although it was never clearly described by local investigators or respondents, there seems to be a rule of access associated with female menstruation,

⁴⁹ The four women who categorized this as a shared activity explained that they did so because men will sometimes help women to collect cotton from the trees at their farms or to remove the seeds from the raw cotton.

⁵⁰ There are four different hammock weaves that can be used – *daddo*, *karashai aradu'u*, *midoda-mizoo* and *patuwu* – which are essentially single/double-striped patterns and a 'fish rib' design. Women learn this skill from their mothers or grandmothers, and pass it on to their daughters and granddaughters. However, some women buy cotton from other people in Aishara Ton, or get coloured cotton from Brazil.

in that women who are menstruating cannot collect or handle clay.⁵¹

Several of the older women in particular discussed the powerful spiritual force associated with clay and clay collection spots, although descriptions of the appropriate prayers, offerings and rituals performed to avoid sickness varied. One woman described how her mother and her grandmother painted their backs and foreheads with *powizi* (anatu) – a seed pod containing red dye, which can be used as a type of body paint – and said a prayer known only to the grandmother before digging the ‘mud,’ to make sure that they would not get sick. Another respondent said that women must use a *bina* (i.e., a plant or animal product used to enhance desired skills), mashing it and rubbing it onto their hands before collecting the clay; then, when they use the clay, they must have a bowl of water with this same *bina* in it and make sure that their hands are always covered with it; otherwise, the clay will not form properly. A third woman mentioned that she only made her clay pots during the rainy season – after the farm was burned and planted – because she believed that, if she went to the farm at the same time as she was making pots, all her plants would wilt and die due to the power of the clay.⁵²

The examples above indicate that women are the most knowledgeable about where cotton and clay resources can be found and how they can be processed and used.

⁵¹ This is commented on in a study on Wapichan material culture carried out by the Amerindian Research Unit (ARU) in 1989. The study also includes a detailed description of how women collect and process the clay into various products (ARU 1989: 60-62).

⁵² Even though these are considered to be beliefs of the ‘old people’ – many of which are no longer shared by younger generations – local investigators were uncomfortable discussing this topic, and were unwilling to travel to any of the places where the *kokos* used to collect clay, because of a fear of getting sick or angering the spirits.

Conversely, some natural resource activities are carried out almost exclusively by men.⁵³

One example is cutting leaves using bamboo (*iwa*). Tall bamboo poles are needed for cutting leaves from etai palm trees, which are then dried out and used by men for roof thatch. Although this is a distinctly men's resource use activity, other activities perceived as men's activities, such as hunting, woodworking and basketry (craft making), in fact involve women at various stages of their use and are therefore classified as shared activities.

5.2.2 *Shared Natural Resource Use Activities*

Hunting was categorized as a men's activity by 17 of the 19 women interviewed, and most of the respondents had never been hunting for wild game or had gone with their husbands only occasionally.⁵⁴ It is women, however, who most often process and prepare the meat for the family. Similarly, with few exceptions it is men who collect wood and make weaving frames (*kaoramnai*) and cassava graters,⁵⁵ but it is women who use them to make hammocks and process cassava into bread, *farina*, *kari* and other local staples. Finally, men travel into the deep bush to collect *mokoro* and *tibi* vines and then fashion them into long strips to make baskets, sifters, *dopaawais*, *matapis* and other products. However, it is mostly women who use these products for different stages of cassava processing, for storing food, or for fetching produce and firewood from their farms. In all

⁵³ Natural resources that were listed as used mainly by men were discussed in less detail during the individual interviews due to time constraints and the fact that some women felt their husbands should comment on the use of these natural resources rather than them.

⁵⁴ This varies somewhat with age: a few of the older respondents who lived in the bush with their husbands during the balata trade in the 1960s and 1970s do have some experience hunting, and a few presently continue to hunt with their husbands.

⁵⁵ Many people currently buy their cassava graters from the Wai Wai because there is a certain rock is needed to make them (*kubachimaridako*) and can only be found far in the south.

three examples above, men often have the most detailed knowledge of where these natural resources can be collected, but women's skills are needed to fully utilize them.

Other shared activities that fall within the second general pattern of gendered resource use include oil and jewellery production (see Section 5.1), the utilization of river turtles,⁵⁶ *tibisiri* basketry, home building and the use of forest fruits. It is mostly men, for example, who travel to hunt river turtles, at times accompanied by female family members.⁵⁷ Following the turtles' capture, both women and men work to carve and design spindles⁵⁸ and, once they are made, women use them for spinning cotton. In the case of *tibisiri* basketry – *tibisiri* being a natural fibre extracted from the new shoots of etai palm trees – men climb the trees to collect etai shoots and women or men then strip the thin, clear covering from the outside of the leaves. These plastic-like strips are soaked in water, boiled in salt and lime juice, and dried out in the sun before being woven – often by women – into items such as *dopaawai* headstraps, hats, bags, baskets, mats, ropes and lassos. For home building, materials (e.g., wood for rafters/posts/beams, etai leaves for roof thatch) are collected and transported by women and men together, and are subsequently used by men, at times with help from women, to construct buildings.

⁵⁶ Interestingly, during the initial training sessions the utilization of river turtles appeared to be considered a distinctly female activity and was even included as one of six 'bush resources' on a sketch map made by participants during the women's mapping workshop. It was only during the individual interviews that women described the use of river turtles as a shared activity.

⁵⁷ None of the female respondents had hunted river turtles on their own, most likely because it involves traveling far from the community and women rarely travel extensively without the accompaniment of their husbands or fathers.

⁵⁸ To do this they burst open the shell and take out the flesh of the turtle while it is still fresh. They then scrape off the shell to get it clean, let it dry in the sun and, once it is dry, pare it down with scissors or a file to make it thinner. After this, designs can be carved into the shell, and dyes can be used to colour it (e.g., a certain type of leaf found in the bush – *komti'inaba* – is burned and the ash made into a paste that can be rubbed into the carved grooves on the spindle).

These three shared activities thus often involve women and men traveling together to collect the various resources, and gendered differences become apparent in later stages of use.

The use of forest fruits is also a shared activity, but differs slightly from the activities described above. Both women and men collect various fruits and then women process them into drinks and wines for the family (Appendix G). However, in contrast to the previous examples, the gathering of the fruits can be broadly differentiated along gender lines. For instance, women and children usually gather fruits such as gooseberry, *jamoona*, plum, mango and pine from trees planted in their yards, from farming areas or from bush islands in the savannahs. The presence of these and other fruits trees can, in fact, indicate earlier human settlement in an area, and many of the old village sites can be distinguished by the bush islands and fruit trees that are still growing in the middle of the savannahs.⁵⁹ In contrast, men most often collect wild fruits that grow in more distant forested areas when they are out hunting and fishing, although some of the *kokos* interviewed used to accompany their husbands on these trips. Men climb trees to collect wild fruits such as *туру*, to bring back to their wives for processing. Therefore, deeper analysis reveals that the overall use of forest fruits is both a women's resource-based activity – in terms of the use of fruits found close to homesteads and farms – and a shared resource use activity – when the focus shifts to wild fruits that are found in the more distant forested areas. This is linked to the third general pattern of gendered resource use:

⁵⁹ In *Kidikupuz Danaa*, for example – an old village site where several of the families who initially settled Aishara Ton used to live at their farm camps – cashew and whitey trees were planted and are still growing in the savannahs where old homesteads used to be located.

activities that are carried out by both women and men, but at different times or in different places. This type of pattern is of particular interest because it implies that gendered interactions with certain natural resources can be linked to differential spatial patterns of natural resource use for women and men.

5.2.3 *Common Natural Resource Use Activities*

Activities that fall within this third general pattern of gendered resource use include gathering firewood, fishing and the related use of fish poisons, and medicinal plant use. For instance, both women and men collect firewood, but they use different methods of collection and often travel separately and to different areas. Men tend to collect larger pieces of firewood from riverbanks or forested areas and cut up these logs with chainsaws, sometimes using them to make coals for their wives. Women may help men to fetch these larger pieces of wood in their *dopaawais*, but most often they gather kindling and other firewood from around their homesteads, farming areas and nearby savannahs.

Fish are one of the most important sources of protein in the Wapichan diet. Despite the fact that fishing is generally considered a male activity, it became clear during the interviews that many of the women who categorized it as such also go fishing, but they do so less frequently, go for shorter periods of time and tend to fish closer to the community. Some women accompany their husbands on longer fishing trips, and a few of the women interviewed fish alone or with their children, especially if their husbands work away from the village or are unwell. Thus, at times fishing activities are carried out

independently by women and men, who may travel to different places to access certain fishing spots.

Fishing patterns and techniques are seasonally dependent. In the rainy season, rivers around the community are full, and people use hooks and traps to fish in these faster-flowing waters. During the dry season, people may have to travel further to access fishing spots, since many rivers and creeks around Aishara Ton dry out. At this time, people tend to use nets (e.g., cast nets or seine nets) to catch fish from ponds or pools that are located in deeper parts of riverbeds. Poisonous plants, vines and fruits are also used as a means of catching fish during the dry season at fishing parties (Appendix H). One elderly respondent described a fairly standard fishing party to poison a pond: men collected certain bush ropes (e.g., vines such as *katabaro*) and brought them back to a fishing pond where families had gathered for the event; they then pounded the vines on rocks to mash them up, and strapped them into a *dopaawai*, which they proceeded to dip repeatedly into the water; the poison seeped out and stunned fish in the pond, and the men continued to dip and beat the vines until the fish started floating to the surface; at this point, everyone jumped in to collect the large numbers of fish, and had a fire by the creek where they smoked the fish and shared in a feast. The use of fish poisons is a common activity – both women and men collect and utilize them – but men tend to collect certain poisons from more distant forested areas, whereas women, while at times accompanying men on these trips, mostly plant and collect different poisons from their farming areas and in the savannahs close to the community. In this instance, the

gendered differences become apparent when the types of fish poisons used and the places where they are collected are considered.

The use of medicinal plants is another activity that demonstrates how gender influences the differential use of a common set of resources. There are several trees, plants, shrubs and vines that have medicinal properties, and these are collected, prepared and used by both women and men to treat various ailments. Men most often travel further into the forest to collect certain plants, resins and gums (e.g., bush medicines such as *maroowaiba*, *natu-aiba* and *min*), whereas women tend to gather medicinal plants around the community, in the savannahs and from their farming areas. However, some of the older women in the community used to collect medicinal plants from deep in the bush when they traveled with their husbands to tap balata (i.e., latex). It seems that a wide variety of medicinal plants are still available, but many, mainly younger people no longer know about them or choose not to use them and therefore these natural remedies are not collected as frequently as they used to be.⁶⁰ As with the other resource-based activities that fall within this third general pattern, the fact that the collection of medicinal plants is differentiated by gender is useful in explaining how women's spatial patterns of natural resource use may differ from those of men.

⁶⁰ This may be in part because more people go to the hospital for treatment nowadays instead of traveling to collect their own medicines. Several women stated that they prefer to go to the hospital when they are sick, and only if the medicine from there does not help them will they use medicinal plants or seek out treatment from a *piaiman* (traditional healer). A few women said that they have more trust in medicinal plants and would use natural remedies before going to the hospital.

In summary, a closer look at the different stages of use for particular natural resources reveals that related gendered interactions are nuanced and complex. There are a few natural resources whose overall use is completely gendered, but many resource-based activities involve women and men in overlapping or complementary roles. Women and men also share in certain common activities, but do not always carry them out together, in the same ways or in the same places. The examples given to illustrate these three general patterns of gendered resource use are encapsulated in Table 5.3.

The information presented in this section and summarized in Table 5.3 has interesting and important implications for understanding how gender influences the spatial patterns related to certain natural resource use activities. For instance, the fact that cotton and pottery work are generally considered women's resource use activities is important because it has implications for explaining women's geographies (i.e., movements). The places that they go to get these and other natural resources – such as fruits, firewood, fish, poisons and medicinal plants – often differ from those of men. Women can therefore contribute unique detail to community maps derived from participatory processes. In addition, women may have important and unique knowledge to contribute regarding the preparation and consumption of other natural resources – including wild meat, wood (i.e., for frames and graters), basketry materials, forest nuts, river turtles and etai leaves – that they do not necessarily collect, but with which they are involved at later stages of use.

Table 5.3 A General Overview of the Gendered Dimensions and General Patterns of Natural Resource Use in Aishara Ton Village

ACTIVITY	NATURAL RESOURCE	COLLECTION	PREPARATION	USE/ CONSUMPTION	GENERAL PATTERN
Cotton Work	Cotton	Women	Women	Women	Discrete
Pottery Work	Clay	Women (<i>kokos</i>)	Women	Women	Discrete
Cutting Leaves	Bamboo, Etai leaves	Men	Men	Men	Discrete
Hunting	Wild Animals	Men	Women	Entire household	Shared
Wood-working	Wood	Men	Men	Women	Shared
Basketry (Craft Making)	Plants, Vines	Men	Men	Women	Shared
Oil Production	Nuts, Fruits	Men (sometimes Women (<i>kokos</i>))	Women	Women	Shared
Jewellery Production	Seeds, Feathers, Bones	Women and Men	Women (sometimes Men)	Women	Shared
Utilization of River Turtles	River Turtles	Men (sometimes Women (<i>kokos</i>))	Women and Men	Women	Shared
<i>Tibisiri</i> Basketry	Etai Shoots	Men	Women and Men	Women and Men	Shared
Home Building	Timber, Etai leaves	Women and Men	Men	Men (sometimes Women)	Shared
Forest Fruit Use	Fruits	Women and Men	Women	Entire household	Shared/ Common
Firewood Use	Wood	Women and Men	Women and Men	Women	Common
Fishing	Fish	Women and Men	Women and Men	Entire household	Common
Use of Fish Poisons	Plants, Vines, Fruits	Women and Men	Women and Men	Women and Men	Common
Medicinal Plant Use	Medicinal Plants, Gums, Resins	Women and Men	Women and Men	Entire household	Common

5.3 Variations in Women's Resource Use: Exploring Alternative Axes of Difference and Elements of Change

Although it is evident that women and men interact differently with natural resources, it is also important to recognize distinctions in resource use among women in

Aishara Ton. For example, in part due to changing gender roles, the division of labour between women and men – regarding household-related responsibilities in particular – is becoming blurred. The extent of this perceived shift varied among households, although most of the women interviewed commented that gender roles and responsibilities are changing to some degree, observing that women and men tend to share more tasks than they used to. Some women believed that this shift has been caused by changing lifestyles – their great-grandparents, for example, used to live in or near their farming areas, but now families are based in an established and sedentary community. Also, some women believed that gender roles have changed because of biblical teachings, which promote the concepts of helping one another and sharing in tasks equally. Others commented that these shifting roles are linked to the increased exposure of local residents, through books, visitors and, most recently, television, to other cultures that promote gender equality. Thus, gender roles in Aishara Ton are changing alongside a simultaneous shift in economic, social and cultural norms.

Variations in resource use also became evident in interviews of women from female-led households. Two respondents in particular said that they undertake several of the resource-based activities that were generally categorized as men's activities (e.g., hunting, home building, cutting thatch). One of these women was a widow, whereas the other woman's husband was blind and ill, and in both cases the respondents were charged with carrying out all or most of the household responsibilities, farming activities and forest-, savannah- and water-based resource extraction.

Interviews also revealed that variations in resource use are manifested across generations. Many of the *kokos* said that younger women are showing less interest in learning the skills and knowledge of their elders or in undertaking certain resource-based activities. Several of the older women described how they used to travel long distances with their husbands, sometimes walking for up to a week to collect forest fruits, nuts and river turtles and to fish in larger rivers. Apparently, many of these forest fruits and nuts are still available, but people no longer travel as far into the bush or savannahs to collect them, and few younger people are interested in learning how to process them, preferring instead to buy drinks and oils from the shops. Similarly, younger people in particular no longer travel to hunt river turtles. This may be partially related to the facts that their movements are more limited to areas in closer proximity to the village, that PVC piping or plastic has been introduced to make spindles and that fewer women are spinning cotton and weaving nowadays, preferring to buy cotton or prefabricated hammocks from Brazil.

Some of these generational changes in resource use may be attributed to shifts in the local economy. For example, many of the *kokos* interviewed, who had collected nuts and fruits or hunted river turtles, traveled alongside fathers or husbands who were involved in the balata trade in remote areas of the bush for several months of the year.⁶¹ As demand for balata declined in the mid-1970s, many families returned to Aishara Ton to settle more permanently, and current cash-earning activities, such as mining, do not

⁶¹ Much of the balata bleeding took place from the beginning of the twentieth century until the 1970s – with a ‘boom’ around the Aishara Ton area between the 1950s and the 1970s, according to some residents. The *Kwitaro* river southeast of Aishara Ton was one of the main collection and trading routes (ARU 1989).

necessitate, or are not conducive to, entire families traveling together as far into the bush. Generational differences in natural resource use can also be partially attributed to the notion that roles and responsibilities often change over a person's lifetime, meaning that a woman may be engaged with various activities at different times in her life. One young respondent commented on this, mentioning how her movements and interactions with the surrounding environment are more limited now that she has a young son to care for.

However, some activities – especially those linked to cultural traditions (and which define a particular role for Wapichan women) – are being carried out by fewer women or are no longer being undertaken by anyone. One example that was discussed by participants in the workshop on environmental issues related to the use of clay. Apparently, the different types of clay (distinguished by colour and texture) collected by *oopauros* from specific spots along certain riverbeds are still available, but younger women are not collecting them anymore. In fact, only six of the eight *kokos* interviewed had actively collected clay and made pottery during their lifetimes and none of them are currently engaged in this activity. One 77-year-old woman only recently stopped making pottery, due to an illness that she felt was linked to her “interfering with the mud” without knowing the prayers of the old people. A similar reason was given to explain why younger women are no longer learning this skill: youth do not know the traditional prayers and rituals that allow them to have access to the clay. This is a concern, because the production of certain clay pots (i.e., *damorudu*) is directly linked to the preparation of pepperpot – a traditional Amerindian food dish – and, as mentioned above, the

knowledge associated with pottery work in general is considered an integral part of Wapichan culture and women's role within it.

5.4 Concluding Statements

The analysis in this chapter shows that, according to the initial discussion and classification of responsibilities and activities into gendered categories carried out by residents of Aishara Ton, women appear to take on much of the household-related and agricultural labour. Beyond their contributions to agricultural work, men's activities appear to be almost exclusively related to the acquisition of forest-, savannah- and water-based resources and their involvement in certain trades (e.g., carpentry, cattle work, mechanical work, mining). This generalized categorization of activities can help to explain why women have not previously been involved as hired investigators in PM initiatives: since women's work is assumed to limit their movements, men are most often employed to map out local resource use patterns.

However, further debate during the women's mapping workshop about how to categorize activities indicated that this division of labour is more complex and dynamic. A more nuanced gendered interaction – rather than a strict division – between women and men with regard to their overall use of natural resources became evident. An attempt to classify activities into discrete gendered categorizations can lead to the disregard of important interactions, complementary activities and overlapping uses of natural resources. By breaking down resource activities into more specific tasks – namely, who collects a resource, who possesses the knowledge and expertise to process it, and who

uses or consumes it – it is possible to gain a better understanding of the complexity of related gendered interactions.

Beyond gender, there are other factors that may influence variations in resource use among women themselves in Aishara Ton. For example, resource use patterns in female-led households differ, since these women are charged with more responsibilities and may undertake resource-based activities that require travel to more distant forested areas to access particular natural resources. Other factors that can contribute to variations in resource use patterns among women include age (i.e., changing responsibilities over a woman's lifetime), generational differences (i.e., changing participation in certain customary practices) and changes in local economic opportunities. All of these factors have important implications for explaining the shifts in gender roles that are occurring in Aishara Ton, and in turn can help elucidate the spatial patterns of women's natural resource use in and around the community. These combined analyses can then be used to assess why it is beneficial to include women directly in community mapping projects, as well as to indicate when it is most important to do so.

Chapter 6 – Analysis of Field Data

Outlining Women's Geographies and Highlighting Their Geographical Knowledge of the Aishara Ton Area

This chapter draws on the general and gendered patterns described in the previous chapter to explore the spatial patterns of women's natural resource use and to discuss their geographical knowledge of the Aishara Ton area. Analysis is focused on resource-based activities that involve women – either alone or together with men – in the collection of the requisite natural resources. In general, women carry out their resource-based activities in areas close to the community: at farms, in the savannahs, along riverbanks and in forested areas that are interspersed throughout the environment. In particular, an analysis of water-based activities shows that there are distinctive spatial patterns in natural resource use by women, who perceive the landscape differently from men based on their differing scales of interaction and types of use. In addition, since women tend to utilize areas around the community most intensively, they maintain extensive knowledge of local place names. Thus, women can contribute unique information and important detail to community-scale maps by documenting where they go to carry out certain resource-based activities. This is of particular importance – within the context of environmental and socio-cultural change – for developing management plans that are more reflective of the multiple uses and users of natural resources in the area.

6.1 Outlining the General Spatial Patterns of Women's Natural Resource Use

In general, people from Aishara Ton tend to gather natural resources from around their homes and the community, from their farming areas and the surrounding savannahs, from rivers and riverbanks, and from more distant forested areas ('bush'). Through participant observation, in-depth interviews and sketch mapping activities, it became clear that most women interact with natural resources in areas closer to the village; they generally travel to and from the community and their farming areas, collecting available resources in these places and along the way. In contrast, men often engage in resource-based activities that necessitate traveling to more distant places – to forests, savannahs and rivers – and being away for longer periods of time. At times women accompany their husbands on these longer trips, but this occurs only occasionally nowadays.⁶² This is partly because women take on many of the home-centred responsibilities, which require them to stay in relative proximity to their homesteads and the community. In addition, women's involvement in resource-based activities constitutes only part of their daily tasks and activities, and therefore resource use must be considered in relation to other demands on their time.

During the initial training sessions, the local investigators identified three wide-ranging categories that they felt were representative of women's natural resource use in and around Aishara Ton: (i) agricultural resources; (ii) bush resources and craft-making materials; and (iii) water-based resources. These broad categorizations were

⁶² As discussed previously, some of the older respondents used to travel much further from the community to access particular natural resources (e.g., turtle shells, forest fruits, nuts) with their fathers or husbands, but this is more representative of historical land use patterns (see Chapter 5, section 5.3).

subsequently used as a basis for the creation of three sketch maps during the mapping workshop. Drawing on these maps and the individual sketch maps made during in-depth interviews, it is apparent that women generally collect resources from farming areas (i.e., on farms and along forested farm roads); from forested hills, mountains, 'bush islands' and etai palm swamps in the nearby savannahs; and from water springs, rivers and forested riverbanks.

In the previous chapter, it was made clear that women are involved in the collection of several natural resources (Table 5.3), and the related resource-based activities can generally be associated with certain environmental areas (Table 6.1).

Table 6.1 Linking Natural Resources Collected by Women with Broad Environmental Areas of Acquisition

NATURAL RESOURCES COLLECTED BY WOMEN	BROAD GEOGRAPHICAL AREAS OF RESOURCE ACQUISITION		
	FARMING AREAS	SAVANNAH & FORESTED AREAS (Including Riverbanks)	RIVERS & WATER SPRINGS
COTTON	X		
POISON PLANTS	X	X	
FRUITS	X	X	
WILD SEEDS	X	X	
FIREWOOD	X	X	
NUTS	X	X	
TIMBER	X	X	
MEDICINAL PLANTS	X	X	
ETAI SHOOTS		X	
RIVER TURTLES ⁶³		(X)	X
FISH			X
WATER			X
CLAY			X

⁶³ River turtles are – not surprisingly – found and hunted in rivers and along riverbanks and can thus be linked with other water-based resource use activities. However, women included the collection of turtle shells on their 'bush resources and craft materials' sketch map, and it will therefore be discussed in Section 6.3 below.

However, some of these activities highlight women's geographies more clearly than others. Although natural resource use within each broad environmental area will be discussed, analysis will focus mostly on three water-based activities that are carried out either completely by women (i.e., clay production) or by women and men but often in different places (i.e., fishing, water collection). In this way, it is possible to explore how women's knowledge of and interactions with the local environment may contribute to community-scale maps.

6.2 Exploring the Spatial Patterns of Women's Natural Resource Use: Farming Areas

During the mapping workshop the local investigators facilitated a discussion with participants to inventory the names of both old (i.e., fallow) and current farming places that they use or know of; the participants then drew a sketch map representing 47 farming areas used by residents of Aishara Ton (Appendix I).⁶⁴ Although particular tasks and activities relating to agricultural work can be differentiated along gender lines, the spatial dimensions of these distinctions cannot easily be represented on community maps since women and men carry out their work in the same geographical locations. However, beyond the production of provisions and staple foods, farming areas are also central to the acquisition of several other natural resources (Table 6.1). For example, cotton is planted on farms, and many of the fish poisons used by women – such as *konani*, *aia*, *tii kon* and *komarao* – are also planted in and harvested from old and current farming places

⁶⁴ Individual farm plots were not mapped because they number in the hundreds and are generally clustered within the larger areas specified by participants.

(Appendix H).⁶⁵ Also, certain fruits like *turu* and *wazi*, which are used by some women for making oils and drinks, grow in farming areas; other fruits, such as *owawashi* and *widyoko*, are gathered by women in their yards or from around the community (Appendix G).

The spatial patterns associated with women's use of cotton, certain poison plants, fruits and other resources that are collected from agricultural areas are therefore often encompassed within the broader sphere of farming places. In this instance, women's geographies relating to these natural resources might be more adequately represented on maps of a micro scale – for example, maps focused on resource use on individual farms. Similarly, women's particular knowledge of fruit tree locations in and around the community could more easily be mapped at the household scale. In sum, mapping the resource use sites associated with women's activities within farming areas cannot directly contribute to community-scale maps. Nevertheless, since women are involved in the long-term maintenance of farms and thus spend much of their time in these areas, they have important knowledge of farming places that is distinct in many ways from that of men.

6.3 Exploring the Spatial Patterns of Women's Natural Resource Use: Savannah and Forested Areas

The second communal sketch map shows places that some women go to collect various 'bush resources and craft-making materials.' This map highlights places in the savannahs, in forested areas and along riverbanks where women collect forest nuts, etai

⁶⁵ Other poison plants that are commonly used by women, including *katabaro*, *kokizai*, *aishara* and *makochi-okon*, grow wild in the forests surrounding farming areas.

shoots (to make *tibisiri*), wild seeds, firewood, turtle shells and medicinal plants (Appendix J).⁶⁶ Home-building materials⁶⁷ are also collected from these same general areas and were discussed by some women during their in-depth interviews. Many of these natural resources are not easily associated with specific collection sites, and only general zones of acquisition can be highlighted. For example, wild seeds and firewood are randomly scattered throughout the local environment and are thus gathered opportunistically. This perhaps explains why they were not previously included on the 2003 community maps, although broad collection zones could be indicated if necessary. Indeed, in making their sketch maps women were only able to indicate general areas where they go to look for seeds and firewood, naming certain riverbanks, bush islands or hills in the savannahs near to their farms and the community. Many participants at the mapping workshop were particularly interested in seeing where other women collect firewood, since there is currently a shortage of this resource in the area.⁶⁸

As discussed in the previous chapter, the use of forest nuts, etai leaves, river turtles and building materials often involves women traveling with men to collect or transport these resources. This implies that their patterns of movement may not be easily differentiated. For instance, since hunting river turtles involves traveling for days and

⁶⁶ The composition of the group that produced this map included three *kokos*. This was important because they were the only women who knew where forest nuts and river turtles could be found.

⁶⁷ This includes timber, etai leaves and mud/adobe bricks. While timber and etai leaves are often harvested along riverbanks close to the community, from forested hills/mountains and swamps in the savannahs and from farming areas, people mostly dig up mud and burn bricks in their yards.

⁶⁸ Most respondents commented on how, years ago, more wood was available close to the community, and different varieties of wood that are preferred because they burn slowly and produce a lot of heat – such as *darokai* or *idina* – were easily found (Appendix L).

even weeks to distant rivers such as the *Toto Wa'o*, *Kowitaro* and *Roponan Wa'o*,⁶⁹ women rarely undertake this activity without men, and their knowledge of these areas overlaps. However, a comparison of resource use areas on women's communal and individual sketch maps with information on the 2003 community maps indicates that, even when activities are shared, women sometimes focus on documenting resource use sites around the community that men may overlook. For example, some respondents indicated places near to the community – naming particular rivers, hills, swamps and farming areas – where they go with their husbands to collect timber resources for home building that were not included on earlier maps. As such, even in cases where women and men collect or transport natural resources together and from the same places, they may indicate different sites of acquisition on their maps based on their varied perceptions of the surrounding area.

In the case of medicinal plant use, both women and men collect various plants, but sometimes travel to different places and collect different species of plants. Sixty-one plants with medicinal properties were identified during in-depth interviews with women, who mostly collect them from around their homes and farming areas, as well as from the savannahs and along riverbanks en route. This implies that women may have unique information about certain plants and sites of acquisition. This idea is strengthened by an examination of the 2003 community maps, which do not indicate any locations in areas close to the community and farming places where medicinal plants are harvested;

⁶⁹ Only certain kinds of turtle species are hunted and used for making spindles, and they tend to be the ones with thinner shells: *matada*, *dazao*, *dyariko* and *ariwasho*. According to respondents, *matada* and *dazao* turtles are found mostly around fishing ponds in the savannahs, whereas *dyariko* turtles are found deeper in the forest.

however, the combined information from women's in-depth interviews indicates more than 50 collection sites within this same area. In this instance, women can thus add unique and detailed information to community-scale maps.

6.4 Exploring the Spatial Patterns of Women's Natural Resource Use: Rivers and Water Springs

As mentioned previously, water-based activities – including fishing, and water and clay collection – most clearly represent distinctive gendered patterns of natural resource use. The standardized documentation of water-based activities was therefore chosen over that of other activities because specific sites of acquisition (i.e., fishing spots, water springs) could be easily defined, and these activities also exemplify women's unique interactions with the local environment. The third communal sketch map produced during the workshop included fishing spots – which generally overlap with places identified as washing and bathing areas – and water collection spots (Appendix K). Participants first listed the names of rivers and creeks that they use for fishing, as well as those of specific fishing spots along them that are accessed mostly during the dry season, when the water evaporates and only deeper pools remain. The initial list of rivers was then used as a basis for recording the places that women go to wash dishes and clothes, and subsequent mapping fieldwork confirmed that these overlap significantly with fishing spots; these places were thus documented as single sites with multiple uses. Water springs ('blue pools'), where women go to collect water for drinking or cooking, were documented separately. All these water-based resource use sites were subsequently mapped out with a global positioning system (GPS) unit during field sessions. While

clay collection spots were not mapped during the workshop, in-depth interviews revealed it to be an additional distinct element of the spatial dimensions of women's resource use.

6.4.1 *Fishing Spots*

Among the women interviewed who fished,⁷⁰ the frequency of fishing varied from once a day (e.g., along rivers near to their homesteads) to once a year (e.g., for fishing parties). Some women went fishing three times a week, whereas others went twice a month, whenever they needed food. Women mostly catch a variety of small fish using poisons and nets during the dry season and traps, hooks and lines in the rainy season.⁷¹ The distances traveled and the length of fishing trips also varied quite extensively among respondents, ranging from fishing for a few minutes every day in creeks close to home, to spending two or three days in the savannahs when accessing fishing spots further away from the community (e.g., along the *Roponan Wa'o*). However, most of the women interviewed rarely went away overnight: they might spend half a day fishing along rivers close to Aishara Ton or travel for a full day to rivers further away, but would return home the same day.

As discussed previously, both women and men fish, but not always together or in the same places. The fishing sites that were documented in the field with a GPS unit represent those places indicated by women on their communal sketch map during the mapping workshop. Although this is not a comprehensive map of all women's fishing

⁷⁰ Five of the 19 respondents had either never been fishing or had not been since they had gone as young children with their parents and siblings.

⁷¹ Women also use one particular poison plant in the rainy season – *konani* – because it is potent enough to be effective even in a high volume of water.

spots, it does represent the majority of fishing places that are frequently accessed near to the community (Figure 6.1).⁷²

Women often fish in ponds and creeks that are close to the village. Several of the women interviewed said they go fishing – at times with their husbands or children – along rivers close to the village centre, such as the *Maokaa Wa'o*, the *Kabaun Wa'o* and the *Bakapara Wa'o*, as well as rivers close to Churikidnao, like the *Chiida Wa'o* and the *Churikid Wa'o*. Certain large pools in the nearby savannahs – like *Maskon-nao Baoko* and *Kopiriz Toon Baoko* – are popular places for families to fish, swim and picnic. Several smaller creeks and rivers close to farms are also visited, including *Koshowa'u Wa'o*, *Waotaun Wa'o* and *Dunun Wa'o*. Some respondents said they also travel further into the savannahs – as far west as the *Roponan Wa'o* (not included on Figure 6.1), which involves several hours of walking – to fish with their families at specific ponds or places along the river. This area is particularly popular for having fishing parties during the dry season.

In general, longer fishing trips tend to be carried out by men and usually take them further from the village. Many of these places are represented on the 2003 community maps, which show approximately a hundred fishing spots. Areas of intensive use appear to be concentrated northwest of the village centre and, to a lesser extent, to the west and southeast; most of these fishing sites are located approximately 15-20 km away

⁷² Other spots were discussed during in-depth interviews, but were not mapped in the field and are thus not included on this map.

Figure 6.1 Map of Fishing Spots Indicated by Women from Aishara Ton on Their Sketch Map of Water-Based Activities (2004 Data)

from the community. An excerpt from one of these maps shows some of the fishing spots around the village centre, representing the same approximate area as in Figure 6.1 (Figure 6.2). Note that there are only a few spots visible in this area, to the south of the community and only one spot within the fishing zone indicated by women on their map of water-based activities.

A comparison of Figure 6.1 and Figure 6.2 makes it evident that women and men have indicated very different fishing spots on their respective maps. This is not to say that there are certain 'women's fishing spots' and 'men's fishing spots,' as many men use the same fishing places around the community as women and some women travel with their husbands to fish in rivers and ponds further away from the village centre. However, women utilize fish resources in and around the community more intensively and know these areas well. Their discussion of fishing spots was more focused at this scale, since it is more representative of their interactions with the local landscape. This is reflected in the numerous place names shown in Figure 6.1 and by their descriptions of stories about the areas. Women and men may therefore perceive their surroundings at different scales; thus, even when they engage in common activities, in participatory mapping sessions they may point out distinct sites of resource acquisition.

6.4.2 *Water Springs*

A second element that was included by women on their water-based activities map was locations of water springs. Currently, most households in Aishara Ton have a

Figure 6.2 Excerpt From 2003 Community Map Showing Fishing Spots, with Approximate Boundaries of Women's Fishing Zone (Indicated in Red)

well for collecting water. Prior to this, there were three village wells from which people would collect water; before that, people would get water from rivers and water holes (ponds) that they dug in swamps near to their homesteads or farms. However, most of the women interviewed said they continue to collect water from streams and rivers, or dig pools near to their farms – usually located within 30 minutes' walking distance – when they are carrying out agricultural activities. Water availability changes during the dry season, as some wells and many of the rivers and creeks dry up and only certain spots along deeper rivers remain filled. During this period, some people collect water from their neighbours' wells or the village well in the community, or from clear pools of blue water that do not dry out (water springs), usually at or near to their farms.⁷³ The coordinates of seven springs – representing all water springs used by participants at the workshop, but not by the entire community – were documented using a GPS (Figure 6.3). While incomplete, this still demonstrates that women access water springs close to the community and can add unique information to community-scale maps.

Water springs identified by women are close to the community, and most of them are near to farming areas east of Aishara Ton, although one water spring – *Zamona Baoko* (meaning 'Zamona's Pool') – is found in a forested area south of the community, near a farm. Women indicated the local names for all the water springs, some of which are named after fish (*Kinudu Wa'o*), trees (*Wiizun Wa'o*) and a snake spirit (*Pakoba'i Wa'o*). Indeed, many of these pools are associated with stories of the spirits that inhabit

⁷³ Some of the elderly respondents used these springs when they were younger to soak their cassava for making *kari*, but now many women use plastic tubs. Only a few *kokos* continue to use water springs for this purpose.

Figure 6.3 Map of Water Springs Indicated by Women from Aishara Ton on Their Sketch Map of Water-Based Activities (2004 Data)

and protect them. For example, people are not supposed to collect water or drink from *Wiizun Wa'o*, a small spring found in the savannahs southeast of the village centre, if they are sick, or else they will never recover. Another pool nearby (not mapped) has a large tree growing beside it that is home to many spirits who become angry if people trouble the tree or the pool of water at the bottom of it, and may cause them to get terrible headaches that can be cured only by traditional healers.

Another spring – *Aokazi Baoko* (meaning ‘Heaven’s Creek’) – is also southeast of the village centre. It is said that an alligator spirit lives in the water at the southern end of the pool; if the water is disturbed in this area (i.e., if people remove plants or debris from the edge of the pool), the spirit will be angered and the pool will no longer remain filled with cold, clear water. Finally, *Maskon-nao Baoko* (meaning ‘Old Lady Pond’) is a large pool behind the Aishara Ton hospital. A legend tells of the spirit of an old lady who guards the pond. Women are not allowed to bathe, fish or fetch water from there if they are menstruating, or else the old lady will get angry and cause illness to the person violating her pond. Many of these stories dictate certain rules that seem to indirectly ensure the maintenance of the quality and quantity of the water springs.

Water collection spots and springs were not included on the 2003 community maps of Aishara Ton. This could relate in part to the fact that water collection is a responsibility that continues to be associated with women’s work, and it has thus been overlooked. Also, given that the original objective of making community maps was to show the boundaries of land use, mapping of water collection spots and springs would

not have been a priority, since most water is collected from around the community and nearby farming areas. However, the locations of these spots and springs are important to document for several reasons, especially if community maps are to be used for resource management planning. For instance, during the workshop on environmental issues, participants discussed their concerns about future water access, observing that many wells are shallow and drying out and rivers are filling in with sand.⁷⁴ Some respondents also expressed unease over the potential impacts on water quality of renewed mining activities in the Marudi Mountains south of the village. For all these reasons, it is important for water springs and deeper spots along rivers and creeks that remain filled during the dry season to be identified. Women have an important role to play in this, as they have a breadth of knowledge about the locations and names of these places, their environmental characteristics, and the stories and informal rules associated with them.

6.4.3 *Clay Collection Spots*

The final women's water-based resource activity considered is the collection of clay. Clay is mostly collected from the bottom of creeks or riverbeds to make several different items, including various styles of clay pots (e.g., *damorudu*, a special type of pot with a lid used for cooking pepperpot over the fire; *kara'idao*, a larger open pot used for making porridge), different-sized goblets and jugs for holding water and keeping it cool (e.g., *kamoto* and *dowada*, two types of water pitchers), jugs for holding *kari*, pans for

⁷⁴ According to several participants involved with the research project, many of the creeks have been slowly filling in with sand and debris over the past 30 years or so. Certain areas along the *Maokaa Wa'o*, for example, which used to be deep pools of clear water, are now shallow, murky and filled in with sand. This is true of many creeks in the area, and could be the result of various human activities (e.g., road building, fishing, removal of sand/clay from riverbeds, erosion of riverbanks due to overuse, and an increasing population).

making *farina* and for baking cassava bread (e.g., *potaru*), vases, bowls, cups and chalices. Some women made these items to sell to other people in the community or to outsiders (e.g., tourists) traveling through the area. One elderly respondent described how the woman from whom she learned her pottery skills used to make pots for storing water and *kari* that were so large that a person could fit inside them. Another *koko* related that the original reason for making clay goblets was for burial purposes: the bodies would be burned and the ashes or bones put into the goblets and left in certain places (e.g., caves, forests) with spiritual significance.⁷⁵

Since women are the primary users of clay, it can be assumed that they have the most detailed knowledge about where it can be collected and how it is used. Clay collection spots were not mapped during fieldwork, mainly because of the fact that all the women who know of the places where clay can be found are too old to travel far from their homes, and because of the various regulations associated with its use. However, several of the *kokos* gave descriptions of which rivers and creeks they used to go to and where along these they would dig up the clay. Interviews revealed that the places where and distances that women used to travel to collect clay varied with the individual, although collection spots were often along streams close to farming areas, as well as in a few places around the community. For instance, four of the respondents used to fetch clay from an old farming area called *Bichada Kodanaa*, and two women collected it from a stream in the same area called the *Kubai Wa'o* ('Clay River'). Two of the respondents

⁷⁵ According to one of the local investigators, if people come across any of these old goblets when they are walking out in the savannahs or bush they are not supposed to disturb or trouble them, because if they get the dust from them on their skin they will become increasingly thin until they eventually die.

also used to collect clay from the *Batoro Ban* – a stream with clear, blue water located near an old farming area called *Shikorinao*. All these places are relatively close to Aishara Ton, near farms within one or two hours' walking distance. Other women described how they would walk for three hours or more to reach certain clay collection spots, but they did not name the rivers or describe these areas in detail. Although a few clay collection areas were indicated on the 2003 community maps, all the places described by women during their interviews provide new information.

A final point relates to the fact that nobody from Aishara Ton is currently collecting clay or making pottery. Since no younger women in the village are learning this trade, documentation of the places where clay is found, the various extraction rituals relating to the respectful removal of clay from riverbeds and details of the pottery-making process is important. Now that some of this type of information is documented – in the interview transcripts and on the women's sketch maps – residents of Aishara Ton have a source to draw from and build upon in terms of maintaining a record of customary practices.

Overall, all the examples above both show that women can add unique and important detail to community maps about their water-based resource activities and exemplify how gender can affect people's interactions with the local environment. Women and men tend to travel separately to fish and utilize different areas for fishing, and they will obviously focus on documenting the places with which they are most familiar or which they use most regularly. In the case of water springs, women and men

both maintain knowledge of these places and may access them when they are at their farms or traveling through the savannahs, but these places were overlooked during the 2003 mapping project. Thus, inclusion of women in the mapping process can contribute new information on these places. Finally, since women are the primary users of clay, they are able to contribute unique information about where and how they collect it. All of this additional information can lead to the creation of maps of the local area that are more comprehensive and detailed, and it is also particularly important within the context of socio-cultural and environmental change. The spatial patterns of fishing activities in particular are being affected by changes in the availability and accessibility of various fish species.

6.5 Changes in the Availability and Accessibility of Certain Fish Species Around Aishara Ton Village

Many interviewees, focus group participants and other community members voiced their concern over changes in the availability of certain resources in and around Aishara Ton. In particular, dialogue focused on changes in the availability and accessibility of fish resources.⁷⁶ Several people talked about a noticeable decline in fish populations and said that this is especially evident in creeks, rivers and ponds in closer proximity to Aishara Ton Village. Fewer fish are currently available, there is less variety in the types found, and fish are now much smaller than they used to be (Appendix M). Many respondents attributed these changes to the over-poisoning of ponds and over-fishing in general, as well as to shifts in fishing techniques, an increase in the population

⁷⁶ Of the 19 respondents, 13 discussed the decrease in fish populations as one of their main concerns related to natural resource use in the area.

of the village, and the erosion of riverbanks in the area. For instance, several families poison pools along nearby rivers during the dry season, thus wiping out entire populations of fish without allowing time for them to regenerate (i.e., poisoning kills all of the fish, both mature and spawning). The Village Council has officially banned this practice, but the regulation is difficult to enforce. The decrease in the availability of fish around the community has meant that people now have to travel further and for longer periods to access good fishing spots.

An increase in community-based activities, in combination with the other factors presented above (e.g., over-poisoning, shifts in fishing techniques, population increase, erosion of riverbanks), has also added to the pressures on local fish populations. In turn, this reinforces the gendered differences in fishing patterns: now, men must travel (alone or with other males) to fishing spots further away and for longer periods to try and catch bigger and varied fish species, whereas women are restricted to fishing spots around the community, since they have to take on more of the home-centred responsibilities. The apparent changes in the availability and accessibility of fish species highlight the importance of documenting fishing spots and patterns of use in and around the community: since the rivers and creeks used most intensively appear to be relatively close to the village centre, management interventions will most likely need to be focused at this particular scale.

6.6 Concluding Statements

The research findings show that, currently, women tend to collect natural resources that are available near to the community and their farming areas, whereas men tend to travel farther distances to access natural resources; thus their sphere of interaction with the surrounding environment differs. Their use of certain bush resources and craft materials, such as medicinal plants, makes this evident: both women and men collect plants, but women have particular knowledge about several species that are found in the savannahs, on bush islands and along riverbanks near the village, which is reflected in numerous acquisition sites on their sketch maps. Even when women travel with men to collect certain natural resources (e.g., forest nuts, etai palms, river turtles and building materials), they may map out different places based on their varied experiences with, and perceptions of, the surrounding environment.

Women's unique interactions with natural resources are most clearly represented by their involvement in water-based activities. Women and men both fish and may do so together or separately, near to the village or far from it. However, the fishing spots indicated by women during the mapping workshop provide new information about areas around the community that are used most intensively by local residents. Also, their documentation of water springs that are located in the savannahs and near to farms provides original data about a resource use activity that had been overlooked during earlier mapping work.

Finally, women have the most detailed knowledge about clay collection and pottery work, since they are the primary users of this resource. Their documentation of clay collection spots provides information that has not been previously mapped, and the descriptions given in the interviews of clay extraction rituals and the pottery-making process are an important means of maintaining a record of local cultural practices.

Chapter 7 – Conclusion

Summary of Results, Broader Implications, and Future Directions of the Research

In the past, maps have been widely accepted as objective and neutral representations of ‘reality.’ Since the late 1980s, social theorists have contested this assumption and have revealed maps to be powerful tools, which have historically been produced and used strategically by government agencies and elitist groups. This unveiling of maps as subjective constructs that are embedded within particular political and cultural contexts has necessitated recognition of ‘alternative’ forms of knowing and representing the world. This idea has been drawn upon by indigenous groups around the globe, who are producing counter-maps to symbolize spatial and territorial perceptions that often differ from those presented on official government maps. In essence, they are contextualizing ‘empty’ spaces by making it evident that they are in fact highly cultural places. Although some groups are producing informal maps to promote dialogue and community empowerment at the local level, many are utilizing modern mapping technologies to produce standardized maps.

Despite some genuine concerns about incorporating indigenous worldviews into conventional cartographic frameworks and exposing them to wider audiences, many indigenous communities are choosing to do this as a means of supporting legal negotiations over land and resource rights. In Latin America, participatory mapping (PM) has emerged as a methodology that combines qualitative and quantitative techniques to gather spatial data and geographical information founded in local

knowledge. These processes are undertaken by, or in collaboration with, local peoples who are trained in various research and data-gathering techniques to document information about local land use and to facilitate the production of informal and formal maps. One aspect overlooked within the theory and application of these PM initiatives has been the role of women within them, and the influence of gender on local land use patterns.

In Guyana, recent mapping initiatives undertaken by members of Amerindian communities have drawn on these PM approaches as a means of challenging the authority of government maps as the only valid representations of the regions in which they live. The priorities of the Guyanese government for national development are focused on promoting resource extraction – such as logging and mining – from interior regions that are inhabited by various Amerindian groups. Yet, state agencies remain limited in their capacity to monitor these activities and enforce any relevant laws. Recent attempts to establish a series of national protected areas – many of which overlap with claimed or titled Amerindian lands – have also heightened the debate over rights to land and natural resources. These problems are further exacerbated by the fact that many official maps of interior regions are erroneous. In response, numerous Amerindian communities are creating counter-maps, with technical and training support from representatives of the Amerindian Peoples Association (APA) and international advocacy groups.

This thesis builds on and contributes to a mapping project that was carried out with male residents of Aishara Ton Village in response to renewed mining activities,

conservation initiatives and shifts in the availability of natural resources in the Deep South of the Rupununi. Community maps that were produced in 2003 are comprehensive in their representation of the local area and record detailed information that has never been previously documented. These maps are thus extremely valuable and can be used as the basis for negotiations with external agencies, as well as for local purposes. Indeed, these maps are intended to inform the development of a locally driven resource management plan for the area. In this case, it is important to ensure that the multiple uses, knowledges and perspectives of the local landscape are taken into consideration and represented on community maps. Based on the ideas of conservationist and feminist theorists – that communities are politicized and heterogeneous in their make-up, and that landscapes are gendered – the importance of engaging the participation of women in mapping processes and resource management planning becomes clear.

For this study, PM techniques were employed with local Wapichan women over the course of eight weeks to document how gender influences natural resource use and to gain a better understanding of women's geographies. This diverged from earlier PM projects, which had tended to hire and train men as local investigators. Likewise, this study's approach differed from previous approaches to gender resource mapping, which had rarely prioritized the training of women in technical mapping skills. The study aimed to engage women to gather data from other women, through the facilitation of discussion and the production of maps at both community and household levels. This multi-scale approach simultaneously promoted cooperation on a broader scale, while allowing an assessment of how natural resource use patterns differ between and within households.

By combining qualitative methods, such as workshop discussions, focus groups, in-depth interviews and participant observation, with quantitative field mapping techniques, both informal and formal maps were created. Despite some limitations to the methodological framework – including carrying out intensive participatory fieldwork within a limited time frame, working alongside local women with minimal research experience and negotiating a language barrier – the findings do show that it is possible to successfully involve women as trained researchers in PM projects. The results also indicate that women have distinctive patterns in their resource use, as well as detailed knowledge about the local environment.

7.1 Summary of Research Results

The research results show that women and men have complex and often overlapping or complementary interactions with natural resources rather than a distinct division of labour. Three general patterns of gendered resource use were identified, in part based on the breakdown of activities into collection, preparation and consumption. First, the use of some natural resources is discretely gendered: cotton and pottery work can both be considered women's resource use activities, whereas men are the primary users of bamboo. Other resource-based activities that are perceived to be men's activities are in fact more nuanced in their overall use and are shared to a certain degree – the second general pattern of gendered resource use. Although most women rarely engage in hunting wild game or collecting wood and vines from the bush, for example, they are often involved in processing these resources for consumption or they may use the final products. Other shared activities, which involve women and men in complementary or

overlapping tasks relating to the same natural resource, include the use of nuts, wild seeds, river turtles, etai shoots and building materials. Women and men travel together to collect these resources; both therefore have important knowledge relating to the distribution and use of these natural resources.

The third general pattern of gendered resource use relates to common activities that are undertaken by women and men, independently and usually in different places. These include the use of fruits, firewood, fish, poisons and medicinal plants. In the gathering of plant products, for example, gendered differences are evident in the types of resources people collect (e.g., variations in plant species) and, most importantly, where and how far they go to collect them. In general, women collect various plants from a more localized area.

These general patterns support the notion that women and men have different knowledges and interactions with regard to the use of particular natural resources. However, it is important to recognize that there are also differences in resource use among women. Respondents from female-led households, for instance, engage in collection activities that in other households are mostly carried out by men. Also, there is a noticeable inter-generational difference in resource use patterns: many of the *kokos* commented on how younger women in the community are no longer traveling into the bush to collect fruits, nuts or river turtles. There has also been a decline in cotton work and pottery production, as many women now buy hammocks and aluminum pots.

Further analysis shows that the natural resource use activities that are undertaken by various women in Aishara Ton can be associated with general geographical areas: they tend to collect resources from their farms and along farm roads, from forested hills, mountains, bush islands and etai swamps in the savannahs, and from water springs, creeks, rivers and forested riverbanks. More generally, women are more intensively engaged with resource use in and around Aishara Ton, whereas men are more experienced in collecting natural resources further away from the village. The local investigators identified three general categories of natural resources that women use, which are associated with broad environmental areas: (i) agricultural resources found in farming areas; (ii) bush resources and craft-making materials found in savannah and forested areas; and (iii) water-based resources found in creeks, rivers and springs.

Although women collect various natural resources at their farms, their distinct geographical patterns of use are difficult to represent on community-scale maps since they are encompassed more broadly within shared farming areas. Since women are the primary users of cotton, certain poison plants, fruits and other resources found in farms and fallows, these patterns are important to consider, but they may be more adequately represented on maps of individual farm plots.

In the case of bush resources and craft-making materials, firewood and wild seeds are scattered randomly and, although general zones of collection could be documented, women did not consider them a priority for field mapping. The use of forest nuts, etai shoots, river turtles and building materials all fall within the second general pattern of

gendered resource use: women and men often travel together to collect them, and their geographies are therefore not easily differentiated. However, in comparing the women's maps to the 2003 community maps, it does become evident that women may indicate different sites of acquisition on community maps, based on their differing levels of use and perceptions of the surrounding environment. In the case of medicinal plants, women noted more than 50 places where they gather various plants around the community, none of which had previously been documented.

Water-based activities make the distinct geographies of women's natural resource use and their extensive knowledge of the local environment most apparent. Although women and men both fish in rivers, creeks and ponds around the community, these areas are intensively used by women. As such, they indicated and named several fishing spots in and near the village centre that had previously been overlooked. Similarly, some water springs that are used by women when they are at their farms or traveling in the savannahs were mapped for the first time; the names of and stories told about these places also reflect the fact that women know the area well. Finally, clay collection is a women's resource use activity and, as such, elderly respondents talked about and named several sites of acquisition – many associated with powerful spirits – that can also add detail to existing community-scale maps.

In sum, all of these examples show that women have unique and detailed knowledge about the areas surrounding the community and their farms; their sphere of interaction with the local environment is thus different than that of men. This difference

in the scale at which women and men may perceive and interact with their surroundings has implications for local-level management, as well as for broader applications of PM methodologies.

7.2 Broader Implications of the Research

The results of this research have implications at the local level and can also provide some interesting theoretical and methodological insights. The detailed information gathered by and with Wapichan women for this study can be used to support locally driven counter-mapping initiatives aimed at promoting Amerindian control and management of local lands and natural resources. As focus shifts to using community maps as a basis for natural resource management planning, the inclusion of women's knowledge can add unique and detailed information about resource use and local or external impacts on the environment around the village. More comprehensive maps and a better understanding of women's resource-based activities can inform community-based management plans that are more equitable and sustainable in the long term, since both women's and men's interactions with, and perceptions of, the local environment are considered. Thus, this research contributes to a community-level project aimed at promoting more equitable interactions with external agencies, while simultaneously emphasizing the need to advance more equitable dialogue within the community itself.

At the local level, the information documented and analysis provided for this thesis is also particularly important within the context of environmental change and shifts in cultural practices. Since wells are apparently drying up more frequently during the dry

season, rivers are slowly filling in with silt and mining activities are being renewed southeast of the village, management and monitoring of water resources are of great importance. By documenting locations where people go to collect their water for daily consumption, places in the savannahs that fresh water can be guaranteed, and fishing spots that are intensively used by various members of the community, baseline information is provided. In terms of clay collection, a changing engagement with pottery activities exemplifies a shift in cultural practices and means that a certain aspect of Wapichan traditional knowledge may not be getting passed on in its entirety. Community mapping and the recording of women's use and knowledge of clay are therefore a means of archiving a customary practice that is no longer being carried out by younger generations.

Further, earlier PM projects tended not to hire female investigators, in part because women in many rural and indigenous communities are often limited by mobility and time constraints. Although these same constraints hold true in Aishara Ton, this study shows that women can be successfully trained as local investigators and can play an important role in PM endeavours. The issue is to figure out when, within each particular context, it is most important to document women's knowledge, and when it is most appropriate to engage their participation. Field mapping work in Aishara Ton involved women in gathering data about resource use activities that were most relevant to their daily experiences and movements, in areas in which they were comfortable and to which they were interested in traveling. Community-scale sketch maps helped in gaining an overall understanding of how gender influences home-centred and resource-based

activities, whereas semi-structured interviews allowed women to tell stories and give detailed descriptions of their own uses and perceptions of the local landscape, taking into account the more nuanced aspects of women's natural resource use. By employing PM methods with women in areas close to the village, this study highlights how landscapes are gendered and also ensures that women's unique and detailed knowledges of the local environment are included on "maps-as-usual" (Rocheleau 1995b).

More broadly, the analysis provided in this thesis can supplement the small number of earlier studies about Wapichan communities in southern Guyana. It can also help to address the fact that there is a paucity of information regarding the use of natural resources among Amerindian groups, and the fact that there is minimal documentation of gender roles and relations within Amerindian communities. In her study of Amerindian communities in Suriname, Kambel (2002) devotes an entire chapter to exploring how gendered divisions in labour affect resource use and access rights for indigenous women, and discusses how gender influences several of the same resource-based activities discussed in this thesis (e.g., farming, fishing, gathering). Many of my own conclusions mirror those put forth by Kambel, indicating that the analysis provided in this thesis could be extended to provide theoretical insights and contribute to a better understanding of gender issues in other areas of lowland South America. Finally, despite a substantial amount of literature and research focused on the role of gender in development and natural resource management, there have been relatively few studies carried out in Latin America, especially among rural and indigenous communities. Therefore, overall this

study contributes original data and significant insights into areas of research that have thus far received minimal attention.

7.3 Future Research Directions

As with most academic studies, the process of carrying out and analyzing fieldwork data has provided some insight into the research questions that originally shaped this study, but has also revealed a multitude of possible research areas for the future. This was reflected in the comments of Aishara Ton residents after the field data were presented at a final community meeting: several people stated that this study marks a first step in women becoming more engaged in locally driven research initiatives and that it is only the beginning of a process that could take on many forms, two of which are explored below.

Firstly, one area in particular that piqued the interest of the local investigators during the research process was the documentation of medicinal plant uses and the mapping of where various plants can be found. Although this study provides a preliminary list of medicinal plants used by women in the community, specific information about each plant species was not always recorded and places of acquisition were not mapped. As one resident of Aishara Ton stated, “the whole bush is medicinal.” Thus, a detailed documentation of the uses and locations of specific plants would be a huge, but important, undertaking. This type of project would require the involvement and permission of traditional healers (female and male) from the community. Considering that many plants are associated with spiritual powers – and, more broadly, taking into

account the fact that there are currently no intellectual property laws guaranteeing the rights of indigenous peoples in Guyana – the documentation of this information would best be undertaken and controlled by members of the local community.

Secondly, in relation to natural resource management schemes, this research revealed that many of the places used and visited by residents of Aishara Ton are associated with stories of spiritual powers and guardians. For example, many of the stories relating to the collection of water from springs dictate certain rules that indirectly ensure the springs' maintenance. It is possible that traditions relating to the use of particular natural resources or sites of spiritual significance – and the customary practices associated with them – have historically acted as an informal means of resource management (see Henfrey 2002). Extending this notion through more intensive exploration of spiritual landscapes could benefit the resource management planning process that is to be undertaken by the Wapichan. Modifying traditional customs relating to land and natural resource use could lead to plans that are more sensitive to local practices and may inspire a form of cultural revitalization that sees adapted customary practices being (re)integrated into contemporary lifestyles.

7.4 Concluding Statement

This thesis has important implications for local-level resource management planning, for the progression of PM methodologies, and for the provision of theoretical insight into gendered roles and activities among Amerindian communities in lowland South America. Despite certain limitations of the study, five Wapichan women were

successfully trained in data collection and field mapping skills and were actively involved in carrying out participatory gendered resource mapping with other women from Aishara Ton Village in southern Guyana. These field data show that women and men have different levels of knowledge about particular natural resources or use locations, based on the fact that home-centred responsibilities and other resource-based activities are gendered. Although women's natural resource use and geographies differ by household and age, these combined knowledges can add unique information and important detail to community maps. In this way, the direct inclusion of women in PM processes is not just an 'add-on,' but rather tells us of diverse and distinct dimensions of space, resource use and land occupancy.

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Appendix A Overview of Training Sessions Held with Local Investigators

Training Session	Length	Date (2004)	Overview of Topics Covered and Activities Undertaken
Introduction to Community Mapping	Full day	October 15 th	Review of research; Signing of contracts; Overview of maps and community mapping philosophy; Principles of participatory research; Sketch mapping techniques; Gender roles in Aishara Ton; Women's resource use; Categorizing women's resource use activities; Preliminary discussion of women's mapping workshop; Delegation of tasks/responsibilities (i.e., facilitation; poster; announcements; catering)
Planning the Community Mapping Session and Facilitation Skills	Half day	October 21 st	Feedback from first training session; Facilitation skills (i.e., leadership roles; facilitating a meeting; stimulating participation; public speaking); Discussion/modification of draft agenda for women's mapping workshop; Group work/preparation for the workshop
<i>Women's Mapping Workshop</i>	<i>Full day</i>	<i>October 22nd</i>	<i>Facilitation</i>
Feedback and Planning Next Steps	Half day	October 25 th	Feedback from mapping workshop; Discussion of maps produced and facilitation experience (i.e., working with a group; steps in the process of mapmaking; challenges encountered; lessons learned); Next steps (i.e., based on three priority areas – training of local investigators; academic research; community expectations)
Base Maps and Topographic Maps	Full day	October 27 th	Types of maps (e.g., sketch maps; scale maps; thematic maps); Elements of maps; Topographic maps (i.e., information found on a topographic map; contour lines); Scale and practicing conversion; Grid/Coordinate systems; Using a topographic map (i.e., practice identifying features)
Understanding and Using a GPS	Half day	October 28 th	Explaining a GPS; Using a GPS (i.e., fieldwork practice in the village); Relating GPS data to base (topographic) maps; Recording GPS data and taking field notes
Preparation for Fieldwork and Interview Techniques	Half day	November 1 st	Logistics for fieldwork activities (GPS and topographic mapping; collecting local toponyms); Preparing for interviews (i.e., identifying respondents; translation skills; note-taking)

Appendix B GPS Coordinates and Place Names Collected with Local Investigators

Way Point No.	Feature Name (Wapichan/English)	GPS Coordinates		Accuracy
		North	West	
WB1	Maskon-nao Baoko (Old Lady Pond)	241231	275502	11m
WB2	Koshowa'u Wa'o (Main crossing)	255464	272069	24m
WB3	Waotaun Wa'o	252465	271034	-
WB4	Dununwaoro	252570	270594	19m
SP1	Kinudu Wa'o	251494	271120	16m
SP2	Marowai Wa'o	249943	272176	10m
WB5	Kapudu Wa'o (Marabanta Creek)	247317	272306	20m
SP3	Kaaman Wa'o	247083	272108	8m
SP4	Pakoba'i Baoko (Camodie Pond)	239577	276109	9m
WB6	Kaashan (i)	239581	276062	8m
WB7	Kaashan (ii)	239669	276049	11m
WB8	Achumara-un	239707	275963	7m
WB9	Kliban Baoko	240071	275970	9m
WB10	Lionel Landing	241969	275232	15m
WB11	Tony Landing	242084	274763	15m
WB12	Katuzudu-un (Fish Hole)	242145	275168	17m
WB13	Torowanaruda'u Wanoom (Thunder Creek)	242374	275215	7m
WB14	Matthew Landing	242304	274778	8m
WB15	Wararim-un	242305	274740	10m
WB16	Kabaun Wa'o Complex	242226	274727	14m
WB17	Pozao Wa'o	243521	272749	7m
SP5	Aokazi Baoko (Heaven Creek)	248892	269765	13m
WB18	Tororobai Wa'o	247696	270406	14m
SP6	Wiizun Wa'o	247104	270532	13m
WB19	Wazao-un (Wazao = A type of fish)	245886	273418	10m
WB20	Matthias Landing	243677	273378	13m
WB21	Takuba Ton Baoko/Komaka Baoko	245288	273580	9m
WB22	Daodawuz	245028	273608	-
WB23	Wiizao	242796	273670	6m
WB24	Parakari Baoko	241653	272953	10m
WB25	Komaka Baoko	241234	274431	14m
WB26	Small Kadorari	241394	274098	15m
WB27	Tozoo Baoko	241516	273973	8m
WB28	Charii Baoko	241503	273863	15m
WB29	Wasara Baoko	241617	272997	10m
WB30	Wadidi Wa'o (Cold Creek)	243210	270340	8m
SP7	Zamona Baoko	245548	267014	35m
WB31	Kazaroon Wa'o	245510	265748	15m
WB32	Churikid Wa'o	246443	279555	-
WB33	Kopiriz Ton Baoko	238651	272483	7m
WB34	Baranai Wa'o	241945	273325	7m
WB35	Parizaba Ton Wa'o	242393	272184	10m

Appendix C Interview Guidelines and Questions

Name of Interviewer:

Name of Respondent (i.e. person being interviewed):

Age:

Date of interview:

Location in the Community (i.e. Over the airstrip, Bom Fin, etc):

Background Information:

Where were you born?

How long have you lived in Aishara Ton?

What other communities or places have you lived for long periods of time?

How long have you lived in this house? Have you lived in other areas of the community?

Are you married?

Gender Roles and Resource Use Analysis (Classification)

Women's Resource Activities; Shared Resource Activities; Men's Resource Activities

Resource Activities – Detailed Notes

1. Collecting Water
2. Gathering Firewood
3. Fishing
4. Hunting
5. Farming
6. Gathering Forest Fruits
7. Collecting Wood (Cassava Graters/Weaving Frames)
8. Making Jewellery
9. Collecting Turtle Shells
10. Extracting Oils
11. Collecting Cotton
12. Collecting Clay
13. Gathering Bush Medicines and Resins
14. Harvesting Craft Materials (Weaving)
15. Collecting *Tibisiri*
16. Collecting Building Materials/Timber
17. Collecting Poisons
18. Collecting Bamboo

Final Questions

1. Do you think that men and women's responsibilities (i.e. gender roles) have/are changing?
In what way?
2. Do you think that there have been changes to the local environment and the resource base in your lifetime (i.e. changes in numbers of certain resources, how easy/close they are to access, etc.)?
What types of changes have you seen happen? Why do you think that this is happening?
3. Do you have any concerns about the land or resources in and around Aishara Ton? What do you think is the most important environmental issue at the moment?

Appendix D Wapichan Terminology: Place Names and Resource Lists

Names of Rivers

(*Wa'o* = River/Creek; *Wanoom* = Mouth of River; *Baoko* = Water Pool)

A

Aikuzu (River near to the Kowitaro)
 Aisharaton Wa'o (*Aishara* = A type of bush rope)
 Akazara Wa'o
 Anowana Wa'o
 Aodukudusaba Wa'o
 Aodukuo Wa'o
 Aopara Wa'o
 Aopari Wa'o (*Aopari* = A type of wood)
 Arimaraka Wa'o (*Arimaraka* = Dog)
 Aro Wa'o (*Aro* = Deer)
 Aromoro Wa'o (*Aromoro* = Snake)
 Arorin Wa'o
 Atamunaapakizai Wa'o
 Atoru-unu (i) (*Atoru-unu* = Alligator hole)
 Atoru-unu (ii) (*Atoru-unu* = Alligator hole)
 Atoruz Wa'o
 Aokazina Wa'o
 Awaka Wa'o (*Awaka* = A wild guava)
 Awaru Wa'o
 Aoudukuo Wa'o
 Azanda'i Wa'o (*Azanda'i* = A type of snake)

B

Bakapara Wa'o (*Bakapara* = Tree with a brown fruit (yellow inside))
 Barakazowau Wa'o (*Barakazowau* = White-haired person)
 Barapauzo
 Baroodan Wa'o
 Bashizoron Wa'o
 Batoro Ban
 Baudokoruda'u Wa'o
 Bawara Wa'o
 Burautaaka Wa'o
 Buru Wa'o
 Burushu Wa'o

C

Charii Wa'o (*Charii* = name of a certain man)
 Charirib Wa'o
 Chawudu Wa'o
 Chiida Wa'o
 Chooni Wa'o
 Churikid Wa'o (*Churikid* = A type of fish)

D

Diniada Wa'o
 Doro Doro Wa'o (*Doro Doro* = Black mud)
 Dowada Ton Wa'o
 Dununwaoro
 Dyariko Wa'o
 Dyuwukunudu Wa'o
 Dyuwuza Wa'o
 Dyuuwuz Wa'o (i)
 Dyuuwuz Wa'o (ii)
 Dyuwu Wa'o (*Dyuwu* = Etai Fruit)

I

Iizai Wa'o
 Ikizapa
 Irishimada Wa'o
 Ishizi Ton Wa'o (i)
 Ishizi Ton Wa'o (ii)
 Itikiz Wa'o
 Iwa'u Wa'o

K

Ka'aokizai Wa'o (*Ka'aokizai* = Burning Place)
 Kaaman Wa'o
 Kaazuu Wa'o (*Kaazuu* = Sweet Potato)
 Kabaun Wa'o (*Kabaun* = House)
 Kabazidi Wa'o
 Kadada Wa'o
 Kadino'o Wa'o (*Kadino'o* = Beard)
 Kamadiwada Wa'o
 Kamatuo Wa'o (*Kamatuo* = Leech)
 Kamirawanaa Wa'o
 Kamowarukun Wa'o
 Kanao Wa'o/Iarunaa Wa'o (*Kanao* = Boat/
Iarunaa = Deep Pool)
 Kapokizai Wa'o
 Kapudu Wa'o (i) (*Kapudu* = Marabanta)
 Kapudu Wa'o (ii) (*Kapudu* = Marabanta)
 Kapuduz Wa'o
 Karara'i Wa'o
 Karawirii Wa'o
 Karawiro Wa'o
 Kashoro Ton Wa'o
 Katonan Wa'o
 Katorizpao Wa'o
 Kawarori Wa'o (*Kawarori* = Wild Cashew)
 Kazaru Wa'o (i)
 Kazaru Wa'o (ii)

Kazaroon Wa'o
 Kiiban Wa'o (*Kiiban* = Rock)
 Kibiwiz
 Kichipi Wa'o
 Kinaru Wa'o (i) (*Kinaru* = Cotton Ball)
 Kinaru Wa'o (ii) (*Kinaru* = Cotton Ball)
 Kinudu Wa'o (*Kinudu* = A type of fish)
 Kiokio Wa'o/Shozoda Wa'o
 Kiizid Wa'o/Wanoom
 Kizipi Wa'o (*Kizipi* = Fish)
 Kobanwa'ona'o Wa'o
 Kobawuzu
 Kodidi Wa'o (i)
 Kodidi Wa'o (ii)
 Kodowidi Wa'o
 Kodowin
 Kokoi Wa'o (*Kokoi* = Harpy Eagle)
 Kokoidan Wa'o
 Komakata'o Wa'o
 Komarao'ora Wa'o
 Konaro Wa'o
 Kopau Wa'o (*Kopau* = Fish)
 Korokorobau Wa'o
 Koromada Wa'o
 Koshowa'u Wa'o
 Kotowu Wa'o
 Kowamai Wa'o (*Kowamai* = Hat)
 Kubai Wa'o (i) (*Kubai* = Clay)
 Kubai Wa'o (ii) (*Kubai* = Clay)
 Kowitaro

M

Madarudu Wa'o
 Mairi Wa'o
 Mamarauzok Wa'o
 Mankada Wa'o
 Maokaa Wa'o (*Maokaa* = Adolescence)
 Maokaatao Wa'o
 Maokoa Wa'o
 Mapapara Wa'o
 Maporuz Wa'o
 Mapuzu Wa'o
 Marid Wa'o
 Maro Wa'o (*Maro* = A type of tree)
 Marudu Kuo Wa'o
 Masho Wa'o
 Masowiki Wa'o
 Mididi Wa'o
 Mokorochowin Wa'o
 Mooraun Wa'o

N

Naramachibau Wa'o
 Natu Wa'o

O

Ochorodan Wa'o
 Oii Wa'o (*Oii* = A blackbird/witchbird)
 Oii Baoko (ii) (*Oii* = A blackbird/witchbird)
 Omizain Wa'o
 Oozoriin Wa'o
 Orana Wa'o
 Ororokara Wa'o
 Otuorodan Wa'o

P

Pa'idinkizai Wa'o
 Pakoba'i Wa'o (i) (*Pakoba'i* = Camodie)
 Pakoba'i Wa'o (ii) (*Pakoba'i* = Camodie)
 Panakaru'u Wa'o (*Panakaru'u* = A medicinal plant)
 Parapida Wa'o
 Parizaba Baoko
 Pawishi Ton Wa'o (*Pawishi* = A type of bird)
 Pii Ton Wa'o
 Pfi Wa'o (i)
 Pfi Wa'o (ii)
 Pizoota Wa'o
 Podubara Wa'o
 Pokoridi Wa'o
 Podu Wa'o (*Podu* = Black)
 Porowa Wa'o
 Powatu Wa'o (*Powatu* = A monkey)
 Pozao Wa'o (*Pozao* = A lost person)

R

Roomi Ton Wa'o
 Roponan Wa'o (*Rupununi* River)

S

Sakara Wa'o
 Saonooruda'u Wa'o (*Saonooruda'u* = Fox)
 Shakaida Wa'o
 Shakaraida Wa'o
 Shaowidi Wa'o
 Shawarau Wa'o
 Shikodau Wa'o (*Shikodau* = A type of creature)
 Shizaipuzu Wa'o/Wanoom
 Showfi Wa'o
 Sopizian Wa'o
 Suzaoron Wa'o
 Suzubazi Wa'o

T

Tadikaa Wa'o
 Tamaruo Wa'o (*Tamaruo* = Bat)
 Tamta'o Kubu Wa'o (*Tamta'o Kubu* = Purple Rock)

Tapi'izi Wa'o
 Tapowaoro
 Tapowaoro Wa'o Kuwuzoo
 Tarabaa Wa'o
 Tarapudu Wa'o
 Tararamauda'u Wa'o
 Tariiz Wa'o
 Tashoton Wa'o
 Tizitizi Wa'o
 Tizi Tizi Wa'o
 Tokari Wa'o (*Tokari* = Purple Rock)
 Tororibai Wa'o (*Tororo* = A rock used for
 smoothing clay pots)
 Torowanaruda'u Wa'o (*Torowanaru* =
 Thunder; *Da'u* = Place)
 Tooruz Wa'o
 Toto Wa'o
 Tozao Wa'o
 Tozoowan Wa'o
 Tozoowan Baoko

W

Wabo Wa'o (i) (*Wabo* = Palm)
 Wabo Wa'o (ii) (*Wabo* = Palm)
 Waboton Wa'o
 Wadidi Wa'o
 Wakokowada Wa'o (*Wakokowada* = A type
 of tree)
 Wakokowada Wa'o

Wamoko Wa'o
 Wapidi Wa'o
 Waotaun Wa'o
 Warid Wa'o
 Waro Ton Wa'o
 Waro Wa'o Wanoom
 Waruzo Wa'o (*Waruzo* = Fox)
 Wazi Wa'o (*Wazi* = Parrot)
 Wichauzon Wa'o
 Wiidya Wa'o
 Wiiko Wa'o (*Wiiko* = Black ants)
 Wiikun Wa'o
 Wiizun Wa'o (*Wiizun* = A type of tree)
 Wurada Wa'o (i) (*Wurada* = Turtle)
 Wurada Wa'o (ii) (*Wurada* = Turtle)
 Wuzamunaru Wa'o

Y

Yaamata Wa'o

Z

Zamaka Wa'o (i)
 Zamaka Wa'o (ii)
 Zizi Wa'o (*Zizi* = Diaorreeh)
 Ziziton Wa'o (*Zizi* = Diaorreeh; *Ton* = bush island)
 Zokot Wa'o
 Zowakaru Wa'o (*Zowakaru* = Firewood)

Names of Mountains/Hills/Bush Islands*(Tao = Mountain; Nao = Hill; Ton = Bush Island)*A

Akazara Nao
 Atamada Ton
 Aodukuo Tao

B

Baidan Nao (*Baidan* = Duck Egg)
 Baiz Tao
 Barakazowau Tao
 Baudokoruda'u Tao
 Bichada Kodanaa Tao
 Burautaaka Tao

D

Dara Dara Ton
 Dowada Ton
 Dyorowada Tao
 Dyuborowu Nao

I

Iizai Tao (*Iizai* = Blood)

K

Kaazuu Tao
 Kabazidi Tao (*Kabazidi* = Creature w/long nails)
 Kadibaro Tao (*Kadibaro* = Moss)
 Kadino'o Tao (*Kadino* 'o = Beard)
 Kadunuba Nao
 Kamirawanaa Tao
 Karawaimun Tao (*Karawaimun* = Blue)
 Karawiro Tao
 Katambaro
 Katubara Nao
 Kiiban Tao/Kiiban Ton
 Kitanauzon Tao
 Kodowidi Nao
 Kamirawanaa Tao
 Korinaba Nao
 Korokorobau Tao
 Koshara Dapu (*Koshara* = Wild Deer, *Dapu* = House)
 Kowazaz Nao (*Kowazaz* = Snake Hill)

M

Ma'achai-un Tao

Maokaa Tao (*Maokaa* = Adolescence)
 Mapuz Ton
 Mapuzu Kakori Tao
 Mapuzuwa'o Tao
 Maridi Wa'o Tao (*Aishara* Ton Mountain)
 Marowaidozoon
 Marudu Kuo Tao (*Marudu Kuo* = Mildew)
 Miikooro Ton
 Minau Nao

N

Naramachibau
 Natu Ton

O

Oridoon
 Otonam

P

Parizaba Ton
 Pii Ton
 Pokoridi Nao
 Pozaowa'o Tao (*Pozao* = A lost person)

R

Rapa Rapa Tao
 Roomi Ton

S

Shakara'i Nao
 Shamauda'u Tao
 Shawarau Tao
 Shiikodau Ton
 Shishibaa Ton
 Sopizian Nao
 Suburudukuo Tao

T

Tadikazada Tao
 Tokari Nao

W

Wabo Nao (*Wabo* = Palm)
 Wakokowada Ton
 Warid Tao

Trees/Shrubs/Grasses/Plants

Achawii (Medicinal Plant – Wild Garlic)
 Akuyuru (Leaf)
 Arotain Daru (*Arotain* = Deer Ears; *Daru* = Father) (Tree)
 Bishawuda (Plant)
 Chaakoibazi (Vine)
 Chiika'u (Wood)
 Choirikitain (Tree)
 Darokai (Wood)
 Dyakara (Medicinal Plant)
 Dyuwuzu (Palm)
 Idina/Idinakun (Tree; used for firewood)
 Idina-daru (Tree; medicinal plant)
 Iminaru (Cayumbe; tree used for medicinal purposes; firewood; used to clean pots)
 Isha'uza (Wood)
 Iwa (Bamboo)
 Kaikaya'u (Wood)
 Kaizwizi (Medicinal Plant)
 Karapau (Crabwood)
 Karashaipa (Tree)
 Kawaiz (Plant)
 Kiibio (Tree)
 Kobtudu (Medicinal Plant)
 Kodidi (Wood)
 Komaka (Tree)
 Komti'inaba (Leaf; used as a dye and for roof thatch)
 Kopiriz (Wood)
 Koshara Zadako (Tree; used for Firewood)
 Kotowu (Tree)
 Ma'achai Wadokori (Plant)
 Ma'asso (Medicinal Plant)
 Ma'oo (Tree)
 Machi
 Mankadu (Bush island)
 Maroowaiba (Tree/Resin)
 Marusho'i (Medicinal Plant)
 Mashomada (Tree)
 Min (Wax)
 Mokoro (Plant)
 Moco Moco (Plant)
 Mozii (Wood)
 Natu-aiba (Tree/Resin)
 Owazi (Bush rope)
 Parawidyan Aka (Wild banana fruit)
 Pazarotan (Medicinal Plant)
 Pii (Seeds for making jewellery)
 Piisharu (Wood)
 Pinao-kun (Tree; medicinal; oil)
 Pitoro (Tree)
 Pozidikau (Grass)

Pokoozo Soman (Medicinal Plant – *Lizard Cigarette*)
 Pokoridi (Tree - Kokerite)
 Poroto (Wood and Medicinal Plant)
 Powizi/Powizibai (Anatu)
 Rap-Rapu (Medicinal Plant/Wood)
 Saporodai (Tree; used for Firewood)
 Shanaribai (Made of tree sap; medicinal)
 Shiiwu (Tree)
 Shishiwai (Tree)
 Soiriki Tain (Tree)
 Takuba (Tree; good to make bows)
 Tam (Small shrub used to dye seeds)
 Tarii Mada (Tree – Medicinal; *Mada* = Bark)
 Tibi (Nibbi – Bush rope)
 Tibisiri (Dyuwuzu Idiba)
 Tokoro (Wood – Kaunta)
 Tooru (Shrub – Medicinal)
 Toro (Wood – Frames)
 Waasaru (Wood)
 Wabo (Palm)
 Warada (Tree)
 Warakapu (Medicinal Plant)
 Waruzo Tain (Shrub)
 Wataba (Tree; useful for strapping)
 Widuko (Wood)
 Zariao (Wood)
 Zini'i (Plant – Krawa; Used for making rope)

Forest Fruits

Akawai (Milky Banana)
 Achadam (Fruit)
 Irim (Fruit)
 Iziari (Balata fruit)
 Kaawaiz (Fruit – Similar to Balata fruit)
 Karowai (Fruit)
 Kawai (Fruit)
 Kazaruzowau Wau (Fruit; 'yellow macaw head')
 Kaziman (Fruit)
 Kobiki (Fruit)
 Korami (Fruit)
 Makamkari (Fruit – 'Whitey')
 Mapuz (Fruit)
 Minau (Guyana Nut)
 Ochoro (Fruit)
 Owawashi (Fruit)
 Pa'akowaa (Banana)
 Pawishibawun (Fruit – Medicinal)
 Powizi (Anatu)
 Wamook (Fruit)
 Wazi (Fruit – Awarra)
 Widyoko (Fruit)
 Wurada Kodoro (Fruit – *Turtle Knees*)
 Zoopo (Fruit; plum)

Cotton Work

Daddo (Hammock weave)
 Karashai Aradu'u (Hammock weave – *Fish Ribs*)
 Midoda-mizoo (Hammock weave)
 Patuwu (Hammock weave)
 Kaoramnai (Frame for weaving)

Jewellery Materials

Pinidii (Grass seeds)
 Rirou ('Bok Beads' – Red and black)
 Wachichipi ('Bok Beads')

Clay Work

Damorudu (Clay pot for cooking pepperpot)
 Dowada (Clay pot)
 Kamoto (Clay pot)
 Kara'idao (Clay pot)
 Kubaiao (Clay pot)
 Oopauzo (Clay Potter)
 Potaru (Clay pot)

Animals

Ariwashu (Water turtle)
 Dazao (Water turtle)
 Dyariko (Water turtle)
 Matada (Water turtle)
 Wurada (Turtle)

Fish/Fishing

Achimara (Fish – Himara)
 Aia (Fish Poison)
 Aishara (Fish Poison)
 Daroko (Fish Trap)
 Dyoboro (Fish - Patwa)
 Imizu (Fish)
 Inako (Fish Poison)
 Iziichaba (Fish – Huri)
 Kadakoba (Fish)
 Kamunaru (Fish)
 Karaashai (Fish - Yarrow)
 Katabaro (Fish Poison)
 Katuzuda (Fish)
 Kawazi (Fish Poison)
 Kizipi (Fish – 'Piab')
 Kokizai (Fish Poison)
 Komarao (Fish Poison)
 Konani (Fish Poison)
 Koro-korowai (Fish Poison)
 Kotii (Fish)
 Mairi (Fish)
 Makochi-okon (Fish Poison)
 Oko (Fish Poisons – general)
 Orododa (Fish)
 Parizaba (Fish - Lukunani)
 Pazaonan (Fish Poison – Plant looks like onion or garlic)
 Pizai (Fish Poison)
 Poroaba (Fish)
 Soiriki (Fish)
 Tii Kon (Fish Poison – Plant)

Other Words

(Kuba)Chimaridako (Rock to make cassava graters)
 Manorin (Self-help)
 O'i (Farine)
 Torara (Resin from a tree; Like Balata; Used to make candles)
 Wiiazo/Shiikodau (Little man who whistles and brings bad luck/death)

Appendix E: Oils Extracted and Used by Women in Aishalton Village as Discussed by Respondents During Individual Interviews¹ (in order of frequency of use)

FRUIT/ NUT	USE	LOCATION/ ACCESS	PROCESS
Coconut	Hair oil Skin oil Repellent (i.e., to keep away kaboro) Medicinal (e.g. rub into scalp for a cold; rub onto scars; rub onto belly if it is paining)	From the yard Buy from others	Grate the coconut; add water; strain it; leave it for 2 hours or overnight. The oil floats to the top of the water; skim it off with a spoon; fry it
<i>Turu (Ochoro)</i>	Hair oil Cooking oil Skin oil	Farming areas From the bush, along the <i>Konaro Wa'o</i> (about 3 hours walking) South, along the Marudi road, all along the creeks Around the <i>Toto Wa'o</i>	Scald the turu to soften the fruit; take the flesh off the seed. Boil the flesh; put it out in the sun; the oil starts to run. Then pound it; extract the seed shells; put it into a <i>matapi</i> ; and squeeze out the oil
<i>Minau</i> (Guyana Nut)	Cooking oil Hair oil	Scattered all along the <i>Toto Wa'o</i> From the bush around the farm (i.e., at <i>Koshowad Nao</i>) Certain areas around <i>Shikorinao</i> Along the <i>Tozoowan Baoko</i> (a creek to the east, one day walking) 200 trees in a place called <i>Karawiriti Wa'o</i> (2 days walking, to the south, via Marudi)	Chop the nut; parch it; boil it; and grind it; use the oil

¹ One respondent also talked about making oil from *ite* fruits, but gave no other information about it, so it is not included in this chart

<p><i>Karapau</i> (Crabwood)</p>	<p>Hair oil</p> <p>Medicinal (used for sores)</p> <p>Medicinal (drink it to clean out the blood)</p> <p>Repellent</p>	<p>Found all along the road to the <i>Karawirii Wa'o</i></p> <p>Trees are scattered all around old farming areas (i.e., <i>Bichada Kodanaa</i>)</p>	<p>Crack the nut; grate it; strain it, leave it overnight. The oil floats to the top; skim the oil off with a spoon; fry it; and then it is read to use (looks like a cream)</p> <p>OR</p> <p>Boil the seed; leave it for one week (to get dry in the shell). When it is dry, break the nutshell open; mash up the inside; put the mashed nut into a container in the sun, at an angle. Put another container underneath, as the oil will drip down</p>
<p><i>Wazi</i> (Awarra)</p>	<p>Repellent</p> <p>Hair & skin oil</p>	<p>Along the road to the farming area (i.e., at <i>Wazi Toon</i>)</p>	<p>Use the flesh of the fruit: mix it with water. The oil rises to the top; skim it off; fry it</p>
<p><i>Pokoridi</i> (Kokerite)</p>	<p>Repellent</p> <p>Hair oil</p> <p>Skin oil</p>	<p>Found all around the area</p> <p>In the bush (i.e., along the <i>Bakapara Wa'o</i>)</p>	<p>You use the seeds to make the oil</p> <p>Burst open the seed; grind/pound it; add water; strain it. The oil will float to the top; skim it off; boil it; use the oil</p> <p>OR</p> <p>Scrape out the seed; dry it out; cook it; burst/crack it open. Pound the jelly found inside; add water. The oil rises to the top; use this to put on your skin</p> <p>OR</p> <p>Boil kokerite fruit to make porridge; dry out the seeds; crack them and squeeze out the oil</p> <p>OR</p> <p>Dig a small pit into a log; crack the seed into it and pound the seeds and jelly until it is oily</p> <p>OR</p> <p>Eat the fruit; dry out seeds in the sun; crack them; pound jelly from inside the seed in a mortar; put it into a wet cloth; squeeze it out to get the oil</p>

<i>Pinao-kun</i>	Used for itches	One tree located along the <i>Bakapara Wa'o</i> (close to Aishalton Mountain) One tree along the <i>Kabaun Wa'o</i>	Extract oil from the tree (i.e., tap it)
Spider Monkey Oil	Cooking Oil	From <i>Awaraunawa</i> (Wapishana village to the Northeast)	N/A
<i>Rap-Rapu</i> (wood)	Medicinal (i.e., rub it onto sores to help them heal; to get rid of worms in the skin)	N/A	Split the wood in two; grate the inner flesh, process it the same way as coconut oil (see above)

Appendix F Materials Collected for Jewellery-Making Discussed by Respondents During Individual Interviews (in order of frequency of use)

ITEMS COLLECTED	LOCATION/ACCESS
<i>Rirou/Wachichi</i> ('Bok beads')	Farming areas From the bush Around the community Along the banks of the <i>Maokaa Wa'o</i> and the <i>Chiida Wa'o</i>
<i>Pii</i> seeds	Dry pods from farm at <i>Koshowad Nao</i> From the bush Along the <i>Ororokara Wa'o</i>
Feathers	From the bush From men who shoot the birds when hunting (macaw (parrot) and eagle feathers)
<i>Pinidhi</i> (Grass seeds)	You have to plant them in farming areas
<i>Parawidyan</i> (Wild Banana) seeds	Farming areas From the bush
<i>Kokerite</i> seeds	Farming areas Along the banks of the <i>Maokaa Wa'o</i>
Pea fruit seeds	Farming areas Along the banks of the <i>Maokaa Wa'o</i>
Anteater nails	Gathered from the decomposed remains of the animal, after men have hunted it
Tiger teeth	Gathered from the decomposed remains of the animal, after men have hunted it
Cow horns	When come across (i.e., opportunistic gathering)

Appendix G Common Fruits Gathered and Used for Eating/Making Drinks Discussed by Respondents During Individual Interviews (in order of frequency of use)

TYPE OF FRUIT	USE	LOCATION	PROCESSING	# OF USERS
<i>Turu</i> (Mapuz and Ochoro)	Putting in porridge Cooking Drinks	Farming areas (scattered in the bush) (i.e., <i>Waotaun</i> ; <i>Bichada Kodanaa</i> ; <i>Kidikupuz Danaa</i> ; <i>Koshowad Danaa</i>) Along riverbanks (i.e., <i>Konaro Wa'o</i> (about three hours walking); <i>Toto Wa'o</i> ; <i>Kowitaro</i>) Hills (i.e., <i>Koshowad Nao</i> ; <i>Kodowidi Nao</i> ; <i>Kadumuba Nao</i> (Hill to the southeast, via <i>Koshowad Danaa</i> , about 1 ½ hours cycling) Marudi road (south), all along the creeks	Drink: warm up water and put the <i>туру</i> into it; remove the pot from the heat (if you overcook it, it gets hard); mash it with a stick/hands; mix it up to drink	12
<i>Wazi</i> (Awarra)	For Eating	Farming areas (i.e., on the way to <i>Bichada Kodanaa</i> ; <i>Kidikupuz Danaa</i> . <i>Wazi Ton</i>) Along rivers (i.e., scattered around <i>Wuzamunaru Wa'o</i>) Hills (i.e., <i>Kodowidi Nao</i>)	N/A	6
Etai Fruit	Drinks Etai butter For Eating	Etai swamps (i.e., along the <i>Kabaun Wa'o</i> , close to the community) Savannahs (i.e., <i>Kodowida Danaa</i> , a savannah area to the south) Bush areas	Drink: warm up water and put the etai into it; remove the pot from the heat; mash it with a stick/hands; mix it up to drink	3
<i>Irim</i>	For Eating	Found in the deep bush, near <i>Kowazaz Nao</i> From the bush around <i>Shakaida Wa'o</i> and <i>Dywu Wa'o</i> , about 2 hours away walking On the way to <i>Bichada Kodanaa</i>		3
<i>Iziari</i> (Balata fruits)	For Eating	Scattered all around farming areas (i.e., along the road to <i>Bichada Kodanaa</i>) In the bush (i.e., around <i>Shakaida Wa'o</i> and <i>Dywu Wa'o</i> , about 2 hours away walking)		3
<i>Kawai</i>	For Eating	Scattered throughout farming areas Deep in the bush (i.e., at <i>Kowazaz Nao</i>)		2
<i>Owawashi</i>	For Eating	Around the community (i.e., at <i>Wuzamunaru Wa'o</i>) Found along the edge of the bush (i.e., at the bush mouth)		2

<i>Widyoko</i>	For Eating	Around the homestead (compound) Along the <i>Bakapara Wa'o</i> (close to the community) On the road to <i>Bichada Kodanaa</i>	2
<i>Kazaruzowa u</i> ('Macaw head')	For Eating	Yellow fruits that are collected along the <i>Shakaida Wa'o</i>	1
Wild Ginip	For Eating	Collected in the <i>Maridi Wa'o Tao</i> area	1
<i>Zoopo</i> (Plum)	Drinks	At the farm (i.e., <i>Aisharaton Bao</i>)	1
<i>Karowai</i>	For Eating	Collected in the bush around <i>Karawaimun Tao</i>	1
<i>Wamook</i>	For Eating	Found deep in the bush at <i>Kowazaz Nao</i> (towards the <i>Toto Wa'o</i>)	1
<i>Achadam</i>	For Eating	Found in the bush near <i>Maokaa Tao</i>	1
Locus fruit	For Eating	On the road to <i>Bichada Kodanaa</i>	1
<i>Kaziman</i>	For Eating	Found deep in the bush Scattered along the <i>Toto Wa'o</i>	1

Appendix H Plants Collected for Poisoning Fish Discussed by Respondents During Individual Interviews (in order of frequency of use)

POISON NAME	DESCRIPTION/ PARTS USED	ACCESSIBILITY
<i>Konani</i>	Shrub; leaves are used as poison	This is found at the farm and in old farming areas, and is usually planted (i.e., doesn't necessarily grow wild in these areas) <i>Konani</i> is collected during the dry season and the rainy season, (due to its potency, as it is still effective when the water is high)
<i>Katabaro</i>	Round bush rope (i.e., vine); you beat the vine with a stick on a rock and use the pulp	This is found in the bush areas around farms (i.e., <i>Wanaid Wa'o</i>), in old farming areas (i.e., <i>Kidikupuz Danaa</i> , <i>Ma'oo Nao</i>), along the banks of creeks (i.e., by <i>Kaazuu Tao</i> , <i>Shakaida Wa'o</i>) and as far away as <i>Karawaimun Tao</i> (Blue Mountain) This is mostly collected during the dry season
<i>Kokizai</i>	Flat bush rope (i.e., vine); entire vine used and mashed up	This is found in the bush areas around farms (i.e., <i>Wanaid Wa'o</i>), in old farming areas (i.e., <i>Kidikupuz Danaa</i> , <i>Ma'oo Nao</i>), along the banks of creeks (i.e., by <i>Kaazuu Tao</i> , <i>Shakaida Wa'o</i>) and as far away as <i>Karawaimun Tao</i> (Blue Mountain) This is mostly collected during the dry season
<i>Aia</i>	Bush rope (i.e., vine); you use the root and pound it to get out the poison	This is planted at the farm, and is also found in the bush close to farming areas (i.e., around <i>Kaazuu Tao</i>)
<i>Aishara</i>	Bush rope (i.e., vine); you use the root	This is found in the bush, around farming areas (i.e., at <i>Kazaroon Wa'o</i>), and as far away as <i>Karawaimun Tao</i> (Blue Mountain)
<i>Tii Kon</i>	Tree; you use the root	This is found at farms, and is usually planted (i.e., like <i>Konani</i>).
<i>Makochi- okon</i>	Leaves are used for poison	This is found in farming areas (i.e., sometimes planted), grows wild (i.e., close to the community) and is also found along riverbanks (i.e., along the <i>Maokaa Wa'o</i>)
<i>Komarao</i>	Purple plant, very milky; dangerous (i.e., potent)	This is planted at the farm
<i>Inako</i>	N/A	This is found in the savannahs, to the east
<i>Koro- korowai</i>	Roots are used as poison	This is found in the bush, near <i>Marudi</i> (south)
<i>Pazaonan</i>	A plant (like a pineapple leaf); the fruit is used for poison	This is collected from the mountains, and is also found in the savannahs
<i>Pii</i>	A tree; you use the leaves as poison	This is collected from the mountains, and is also found in bush islands throughout the savannahs
<i>Kawazi</i>	A tree; you use the fruits as poison	This grows along the creeks, and is also found in the savannahs
<i>Pizai</i>	A plant; you use the roots as poison	This is found around <i>Karawaimun Tao</i> (Blue Mountain)
<i>Hiari</i>	Bush rope (i.e., vine)	N/A

Appendix I Farming Areas (Old & Current) as Indicated on the 'Agricultural Areas' Sketch Map

1. Aisharaton Bao (*Bao* = Bush)
2. Atamunapa Kizai Wa'o Wanoom
3. Atoru-un
4. Atoruzu Danaa
5. Baiz Tao
6. Bakapara Wa'o Wanoom
7. Bichada Kodanaa (Old Farming Area)
8. Choorin Danaa
9. Kaazuu Tao
10. Kabazidi Tao
11. Kapashi Ton
12. Kapudu Wa'o
13. Katabaroda Nao
14. Katambaro
15. Kazaroon Danaa
16. Kidikupuz Danaa
17. Kiizidi Wa'o Wanoom
18. Kodowida Nao
19. Koromada Tao
20. Koshowa'u Danaa
21. Ma'achaiton Danaa
22. Ma'oo Nao (Carpenters' House)
23. Maokaa Tao
24. Maridi Wa'o Tao
25. Maroo Ton (*Maroo* = Sap from a type of wood)
26. Natu Ton
27. Omizain Nao
28. Oridoan
29. Ororokaru
30. Poi Poi Wa'o
31. Porowa Wa'o
32. Ramau Danaa
33. Roi Roi Danaa
34. Roomi Ton
35. Shaakai Danaa (Old Farming Area)
36. Shawarau Tao
37. Shikorin Nao (Old Farming Area)
38. Suburu Wa'o Tao
39. Suburudu-Kuo
40. Tamaruo Wa'o
41. Tororibai
42. Tooruz Wanoom
43. Waotaun
44. Waruzo Dapu
45. Wiizun Wa'o Wanoom
46. Wuzamnara Wa'o
47. Zizi Ton

Appendix J Natural Resources and General Areas of Acquisition Indicated on the 'Bush Resources/Craft Materials' Sketch Map

BUSH RESOURCE/ CRAFT MATERIAL	GENERAL AREA OF ACQUISITION
Firewood	<i>Bakapara Wa'o</i> – Wood gathered all along the creek <i>Kabaun Wa'o</i> – Wood gathered all along the riverbank <i>Kidikupuz Danaa</i> – A big bush area <i>Ma'achaioon Danaa</i> – Farming area <i>Maokaa Tao</i> – A mountain <i>Marudu Kuo Tao</i> – A mountain to the southeast; wood gathered all around the mountain <i>Shakara'i Ton</i> – A hill where firewood is found
Turtle Shells	<i>Essequibo River</i> (East) <i>Kowitaro River</i> (Southeast) <i>Roponan Wa'o</i> (Rupununi River) (West)
Forest Nuts	<i>MINAU</i> (Guyana Nut) – <i>Burushu Nao, Manu Wa'o, Toto Wa'o</i> <i>TURU</i> – <i>Bichada Kodanaa, Marudi</i>
Tibisiri	<i>Anowana Wa'o</i> (Swampy area; en route to Churikidnao) <i>Arimaraka Wa'o</i> ('Dog Creek' – west) <i>Awaka Wa'o</i> (Swampy area to the east) <i>Dowada Ton</i> (Hill to the south) <i>Oti Baoko</i> (Swampy area to the south) <i>Suburudu Ton</i> (Swampy area to the south) <i>Torowanaruda'u Wa'o</i> ('Thunder Creek') <i>Tooruz Wa'o</i>
Beads (Seeds)	<i>Kabaun Wa'o</i> – all along the river <i>Kinaru Wa'o</i> – all along the river All around farming areas, bush mouth and forest
Bush Medicines (Medicinal Plants)	<i>NATU-AIBA</i> and <i>MAROOWAIBA</i> (Tree Resins) – <i>Karawaimun Tao</i> (Blue Mountain) <i>Marowaidozoon</i> <i>Shawarau Tao</i> (Southeast of Aishara Ton)

Appendix K Fishing Spots, Water Springs and Washing/Bathing Spots Identified on the 'Water-Based Activities' Sketch Map

Fishing Spots

Aisharaton Wa'o
 Anowana Wa'o
 Aro Wa'o
 Awaka Wa'o
 Bakapara Wa'o
 Chiida Wa'o
 Churikidnao Wa'o
 Kabaun Wa'o
 Kiiban Baoko
 Kobawuzu
 Maokaa Wa'o
 Pii Wa'o
 Roponan Wa'o
 Shizaipuzu Wanoom
 Tororibai Wa'o
 Tooruz Wa'o
 Waro Wa'o

Water Springs

Aokazi Baoko
 Churikid Wa'o
 Kapudu Wa'o (*Marabanta Creek*)
 Kazaroon Wa'o
 Ozoriin Wa'o
 Tamaruo Wa'o
 Tororibai Wa'o
 Wiizun Wa'o

Washing/Bathing Spots

Achimara-un (*Achimara* = A big fish; Himara)
 Baranai Wa'o (*Baranai* = Burial ground)
 Charii Baoko (*Charii* = name of a certain man)
 Churikid Wa'o (*Churikid* = A type of fish)
 Daodawuz (Water Falls)
 Kaaman Wa'o
 Kaashan
 Kabaun Wa'o Complex
 Katuzudu-un (*Fish Hole*)
 Kibana Baoko
 Komaka Baoko
 Kopiriz Ton Baoko
 Lionel Landing
 Maskon-nao Baoko (*Old Lady Pond*)
 Matthias Landing/Bakapara Wa'o Complex Parakari
 Baoko (*Parakari* = Cassava drink)
 Parizaba Ton Wa'o
 Pozao Wa'o
 Tony Landing
 Torowanaruda'u Wanoom
 Tozoo Baoko (*Tozoo* = Small, tiny fish)
 Wararim-un
 Wasara Baoko (*Wasara* = A sweet fruit)
 Wiiazo (end of Aisharaton Wa'o)

Appendix L Availability and Accessibility of Firewood Types in and around Aishara Ton, as Discussed During Individual Interviews⁷⁸

TYPE OF WOOD	ACCESSIBILITY	AVAILABILITY
<i>Chika'u</i>	N/A	Not available anymore
<i>*Darokai</i>	Bush areas; Bush islands in the savannahs	Still available
<i>*Idina</i>	Savannahs; Hills	Still available; must travel farther to access it
<i>Ishaa'uza</i>	N/A	Still available; must travel farther to access it
<i>Kaikaya'u</i>	Bush areas	Not available anymore
<i>Kodidi</i>	Bush areas	Not available anymore
<i>*Kopiriz</i>	Bush areas	Still available
<i>Koshara Zadako</i>	N/A	Not available anymore
<i>Mozii</i>	Savannahs	Not available anymore
<i>Piisharu</i>	Bush areas	Not available anymore
<i>*Poroto</i>	N/A	Still available; must travel farther to access it
<i>Purpleheart</i>	Riverbanks	No longer available
<i>Saporodai</i>	From the mountainside	Not available anymore
<i>Takuba</i>	Farming areas	Still available
<i>*Waasaru</i>	N/A	Still available; must travel farther to access it
<i>Widuko</i>	N/A	Still available; must travel farther to access it
<i>Zariao</i>	Bush areas	Not available anymore

*This indicates the types of firewood that are more popular and preferred by the majority of the women interviewed

⁷⁸ The change in availability of these wood types was not measured directly in the field. Commentary in this regard is based on oral interviews, workshop discussions and participant observation.

Appendix M Changes in the Availability (i.e., Species, Size and Number) of Fish in and around Aishara Ton Village⁷⁹

TYPE OF FISH	AVAILABILITY IN/AROUND AISHARA TON
<i>Dyoboro</i> (Patwa)	Fish species that you can still get around Aishara Ton
<i>Haraima</i>	Fish species that you can still get around Aishara Ton
<i>Hassa</i>	Fish species that you can still get around Aishara Ton
<i>Imizu</i>	Fish species not readily available anymore, sometimes smaller ones
<i>Izitchaba</i> (Huri)	Fish species that you can still get around Aishara Ton; smaller in size
<i>Kadakoba</i>	Fish species no longer available
<i>Kamunaru</i>	Fish species only available in the rainy season; fewer in number
<i>Karaashai</i> (Yarrow)	Fish species that you can still get around Aishara Ton;
<i>Katuzuda</i>	Fish species only available in the rainy season; fewer in number; smaller in size; there used to be plenty of them available during the dry season (in pools); used to find them along the <i>Kabaun Wa'o</i> and the <i>Bakapara Wa'o</i> all year round
<i>Kizipi</i> (Piab)	Fish species that you can still get around Aishara Ton; smaller in size
<i>Kotii</i>	Fish species only available in the rainy season; fewer in number
<i>Mairi</i>	Fish species no longer available
<i>Manjee</i>	Fish species that you can still get around Aishara Ton
<i>Orododa</i>	Fish species no longer available
<i>Parizaba</i> (Lukunani)	Fish species no longer available around the community; the <i>Maokaa Wa'o</i> used to have clear blue pools along it, where you could catch them; they also used to be found at <i>Kaashan</i> and at <i>Maskon-nao Baoko</i>
<i>Poroaba</i>	Fish species no longer available
<i>Soiriki</i>	Fish species that you can still get around Aishara Ton; smaller in size
<i>Tiger Fish</i>	Fish species no longer available

⁷⁹ The depletion of fish stocks and changes in species availability was not measured directly in the field. Commentary in this regard is based on oral interviews, workshop discussions and participant observation.