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**Interactions Between Local/Indigenous Communities and
the Natural Environment
in Far North Queensland and Southern New Guinea**

A PARTIAL REVIEW OF RESEARCH TO DATE

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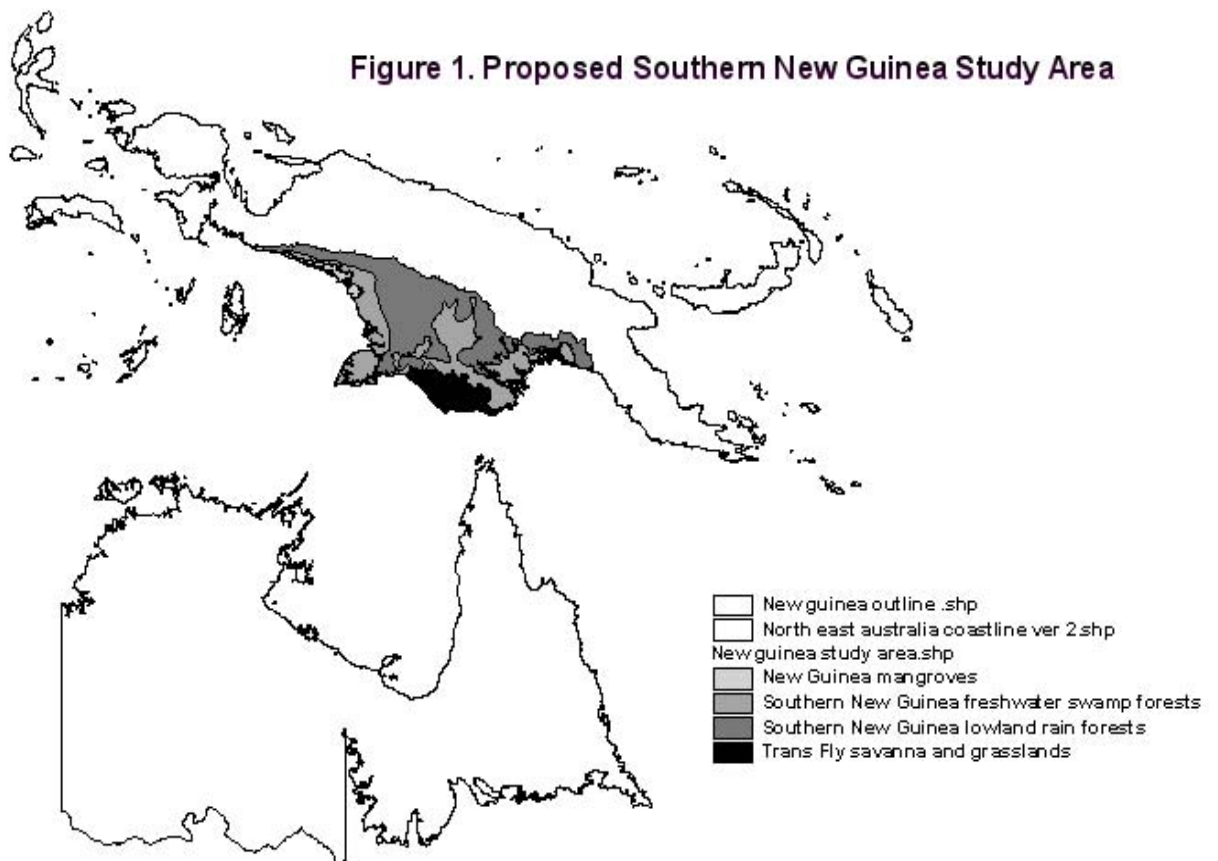
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Interactions Between Local/Indigenous Communities and the Natural Environment in Far North Queensland and Southern New Guinea

A PARTIAL REVIEW OF RESEARCH TO DATE

Background

There is an apparent convergence of interest on the part of several key stakeholders in the need for an integrated, transboundary approach to sustainable development and resource management in the 'ecoregion' which includes Southern New Guinea and the adjoining parts of Northern Australia (here provisionally limited to Cape York Peninsula and Torres Strait). On the PNG side, the outer limits of this ecoregion correspond roughly with the boundaries of Gulf and Western Provinces. On the (West) Papua side, they encompass the whole of the Merauke Regency (Kabupaten) and parts of three neighbouring Regencies, including the whole of the Lorentz World Heritage Area (see Figure 1).



This ecoregion is of major interest to international conservation organisations and their sponsors because of the biodiversity values of its major natural ecosystems (lowland rainforests, tropical savannas, wetlands and coral reefs). It is of interest to Australian government agencies concerned with biodiversity conservation because of the extent to which biological resources are shared between the three jurisdictions. (Dorte Hansen has produced a preliminary draft report on this subject for the Australian Department of Environment and Heritage.)

The conservation of biodiversity is problematic because of the threats posed by extractive industry (mining, forestry, fisheries), which dominates the formal economy of the region. The human population is sparse, and levels of social and economic development amongst the indigenous communities of the region leave a great deal to be desired. This means that poverty alleviation is a major issue and the problem of biodiversity conservation has to be placed in a sustainable development planning framework. At the same time, there are significant problems of institutional governance and capacity in some parts of the region, so an integrated program for sustainable development and resource management must also be a program to build local institutional capacity.

The FNQSNG Program is presently envisaged as a set of projects or activities which are jointly covered by a common framework agreement between government agencies, conservation organisations, research institutions, and other stakeholders with a major interest in this region. Bilateral agreements between the governments of Australia, PNG and Indonesia are essential to the concept. The relevant agreements already in place are the Torres Strait Treaty between PNG and Australia, and the Tri-National Wetlands Agreement between PNG, Indonesia and Australia. The Government of PNG has shown some interest in expanding the geographical scope of these existing agreements for the purpose of natural resource management, and has been seeking support from the Australian and Indonesian governments for such an initiative. Research projects and activities could thus be sponsored and undertaken in order to support the development of a common planning and management framework.

This document has been compiled with inputs from a number of scholars at the Australian National University (ANU) who have specific experience and expertise on this subject and an ongoing research interest in this region. It is intended to complement Dorte Hansen's 'Report on Biological Resources Shared between Australia and New Guinea', by outlining the current state of scientific knowledge on interactions between local and indigenous communities and the natural environment within this the parts of this ecoregion which fall within the jurisdictions of Australia and PNG. A subsequent version will include a review of the literature on the part which falls within the jurisdiction of Indonesia.

Research on Cape York Peninsula

Archaeological research

Archaeological evidence from western Cape York Peninsula, especially from sites located in the coastal and peri-coastal dune systems, indicates ongoing locally-adapted Aboriginal occupation stretching back at least as far as the recent Holocene (i.e. 3000 BP+) (e.g. Cribb et al. 1988; Cribb 1996). This evidence also suggests strong continuities with contemporary Aboriginal land tenure practices. Similarly, work on the northeast coastal region of the peninsula (around the Lockhart River community) demonstrates intensive Aboriginal influence on regional plant communities over an extended period (Hynes and Chase 1981). Archaeological work further to the southeast of the Peninsula (particularly focused on rock-art sites around the Laura and Chillagoe areas (e.g. Morwood and Hobbs 1995) suggests that the region has seen Indigenous occupation and use for at least 40,000 years, with radiocarbon dating suggesting dates of around 32,000 BP at Sandy Creek (Flood and Horsfall 1986) and 37,000+ BP at Ngarrabullgin (David 1993, 1998).

Ethnographic studies

Ethnographic studies of the relationship between local Aboriginal communities and the natural environment found their strongest expression in the University of Queensland's 'ecological school' from the late 1960s and early 1970s (e.g. Taylor 1976, 1984; Sutton 1978; von Sturmer 1978; Chase 1980; Chase and Sutton 1981). This 'ecological' emphasis in the region developed from earlier anthropological work that dealt with the resource-use of Aboriginal people, for example Donald Thomson's seminal article on the 'Dugong Hunters of Cape York Peninsula', and the 'Seasonal Factor in Human Culture' (Thomson 1934, 1939). Thomson's ethnobiological and human-ecological interest stemmed from his pre-anthropological training as a natural scientist (he undertook zoological and botanical research on Cape York Peninsula, as well as anthropological fieldwork).

A particular focus of the 'Cape York School', whose members commenced their research around 1970, has been the detailed 'mapping' of significant places and tracts across Cape York Peninsula, and particularly in the coastal and peri-coastal regions in the west and northeast of the Peninsula. The initial purpose of these 'mapping' exercises was the detailed documentation and analysis of pre-contact, recent historical and contemporary Aboriginal landscapes, and included a focus on sites of resource use, as well as camp sites, places of cosmological significance and the like. These studies reached their peak with the compilation of the massive collected western Cape York site-record 'Aak' in 1990. In recent years, both this earlier research and continuing 'mapping' work have been redirected to the purposes of demonstrating traditional and continuing systems of land use and land ownership for the purpose of claims under State and Commonwealth legislation, including the *Native Title Act* of 1993.

Most of the members of the Cape York School continue to work across the region (e.g. Rigsby and Chase 1998; Sutton 1999), and have been joined by a number of ethnographers, linguists and researchers from other disciplines with similar interests. Much of their research continues to engage with issues of land use and land management, including Indigenous land tenure systems, and maintains an ecological or environmental concern (e.g. Strang 1997).

Cape York Peninsula land use strategy (CYPLUS)

The Cape York Peninsula Land Use Strategy (CYPLUS) was a massive research project, undertaken in the 1990s, which saw a host of expert reports produced as a basis for the development of strategies for future land use across Cape York Peninsula. In part, the CYPLUS process has led to the current Cape York Natural Heritage Trust Plan (see Balkanu 2002b). Among the reports produced for the CYPLUS project, Cordell (1995) reviewed the relationship between Indigenous management of land and sea, and traditional resource-based activities in Cape York Peninsula, including contemporary aspirations to regain control over areas of land and marine environments. Cordell's report includes a series of case studies of Indigenous relationships with land and sea resources across Cape York Peninsula. There have been policy changes at State, Federal and local

levels since the CYPLUS process, and these have affected the policy environment, if not the grassroots realities, surrounding Cape York Peninsula land use. As a result, greater attention is now being paid to current and future involvement of the Indigenous component of the Peninsula's population in land use and land management.

Land claims and native title research

Land claims under the Queensland *Aboriginal Land Act* of 1991 and the Commonwealth *Native Title Act* of 1993, alongside other processes such as transfers and purchases on behalf of Aboriginal groups, have stimulated a huge (and ongoing) amount of anthropological and historical, as well as linguistic and archaeological research to meet the demands of land claim processes. On Cape York Peninsula, this research has included concerted projects focussed on the 'Wik and Wik Way' region of western Cape York – which includes the Aurukun wetlands and the surrounding region, for the purposes of the Wik Native Title claim, and work in the McIlwraith and Iron Range areas of eastern Cape York Peninsula in relation to a number of Aboriginal Land Act claims (and some Native Title claims also).

Unfortunately, much of this research has been limited not only by the scarcity of funds and the limited timeframes imposed on research – in particular, that undertaken for more recent Native Title claims – but also by the constraints and/or perceived need to tailor research in order to match the requirements of claim legislation and process (see Smith 2003a). Nonetheless, important research has been undertaken for claim purposes, or has arisen as a secondary result of such projects. Much of the former work (e.g. that undertaken for the Wik and Wik Way peoples' Native Title determination application) remains unavailable in the public sphere. One key example of research of the latter kind is the edited volume on customary marine tenure in Australia, whose impetus, and a significant amount of its content, arose in the context of potential Native Title rights and interests being recognised in marine estates. It includes a significant paper (Rigsby and Chase 1998) on the continuing customary use and management of sea country by Aboriginal groups on eastern Cape York Peninsula.

The land ownership, management and use aspirations of Indigenous people on Cape York Peninsula have also led to the production of a number of fairly detailed consultancy reports, for example reports such as those by Cooke (1994a, 1994b) on the outstation movement across the region. Research on Indigenous land-holding groups has also been undertaken for other purposes, for example, as part of the Chevron Gas Pipeline Project. This project was co-ordinated by Balkanu Cape York Development Corporation [see below], and undertaken by a number of senior anthropologists. This research aimed to identify the Indigenous groups whose traditional estates would be traversed, and who should therefore be consulted on development, and receive benefits arising from the Chevron Gas Pipeline Project, which involved the proposed piping of gas extracted in PNG and delivered to Gladstone in central Queensland. Similarly, consultation has been undertaken with Indigenous groups associated with 'sea country' along the east coast by the Great Barrier Reef Marine Park Authority, – in the context of an attempt to redesign the zoning plans of the whole World Heritage Area based on biodiversity rather than use. The initial results of this process of consultation will be available at the end of 2003.

Balkanu Cape York Development Corporation

Balkanu Cape York Development Corporation, which initially evolved from the activities of the Cape York Land Council, now exists as an organisation in its own right, to 'address issues [of concern to Cape York's Aboriginal population] other than those directly concerned with land tenure' (Roberts 1998:1). Its key activities are focused on Indigenous land management and sustainable development – typically employing the region's natural resources – for the Aboriginal component of the region's population.

Current or recent Balkanu projects have included work with Kuku Yalanji people in the rainforest area in the south-east of the Peninsula on 'Indigenous knowledge of biodiversity', and work with Kuku Thaypan elders and rangers from the Ang-Gnarra Aboriginal Corporation in Laura on

traditional plant knowledge and sustainable plant use in the drier inland region of southeast Cape York Peninsula. Other projects include the development of an ethnobotanical database with Wik and Kugu-speaking peoples in western Cape York Peninsula (including the Aurukun wetlands), which forms the initial stage of a larger project focussed on ‘Conserving Indigenous Plant and Animal Knowledge for Our Future Generations’, and linked to the development of commercial native plant harvesting opportunities by Aboriginal people at Aurukun (as well as the former Silver Plains station in eastern Cape York) (see Balkanu 2002a, 2002c). Balkanu – alongside other Cairns-based Aboriginal organisations – is also seeking to play a key role in land acquisition, land access and management arrangements, addressing land degradation, development of tourism and support for decentralisation on behalf of the region’s Aboriginal people (see Balkanu 2002c).

Lockhart River Ranger Program

The Lockhart River Ranger Program represents one of the Natural Heritage Trust-based projects on Cape York Peninsula with a more localised focus than some of the other projects which have stronger links to regional Aboriginal organisations such as Balkanu. Its activities over recent years have included the regeneration of local decentralisation aspirations, alongside a ‘caring for country’ push for increased land-management activities involving traditional owner groups, including those with country around the McIlwraith Range.

Local research initiatives on Cape York

Continuing academic, governmental and institutional interests in research involving Indigenous land management on Cape York Peninsula have been increasingly met by interest from local Indigenous groups in involvement with, or control of research undertaken on their traditional lands and involving their customary and contemporary resource use. This interest has increasingly seen the development of research partnerships between local Indigenous people and academics and others conducting research – perhaps influenced by the ongoing involvement of social science researchers (alongside some natural scientists) with Aboriginal communities over the past thirty years (e.g. Cribb et al. 1988), and the growing importance which funding agencies attach to the demonstration of community support for such research to be undertaken. Examples of these partnerships include ethnozoological and ethnobotanical projects (including work on sustainable timber harvesting) involving a number of natural scientists and local Aboriginal rangers at Aurukun (brokered by Balkanu), and the development of research arrangements by outstation/clan groups, including the Northern Kaanju group associated with Chula outstation, who have actively sought to develop joint research projects with academic researchers directly.

Centre for Aboriginal Economic Policy Research (CAEPR)

Ongoing ethnographic work by Ben Smith at the ANU Centre for Aboriginal Economic Policy Research is focussing on ‘Aboriginal outcomes from Land Claims, Transfers and Purchases in Central Cape York Peninsula’ (see Smith 2003a, 2003b). Smith’s ongoing research interests also include (ethnographically-based) analyses of outstations, decentralisation, population mobility and territoriality (Smith 2000a, 2002c), differing relationships to land among ‘local’ and ‘diaspora’ Aboriginal communities (Smith 2000b), the importance of pastoralism as an element in Indigenous (as well as non-Indigenous) relationships to land and resources across much of the Peninsula (Smith 2002a, 2002b, 2003a, 2003b). Smith’s research also deals with negative attitudes towards national parks and protected areas amongst local people, including Aboriginal people (Smith 2002b, 2003b), the effects of regionalisation and other forms of administration as they articulate with Indigenous aspirations (Smith 2002c), and ‘inter-ethnic’ relations between Aboriginal and non-Indigenous populations and agencies (Smith 2003b).

CAEPR has recently embarked on a Mining and Indigenous Peoples Project under the management of David Martin, who has worked with Aboriginal people from western Cape York Peninsula for the past three decades (see Martin 1993). This project, which includes proposed ethnographic fieldwork by Martin and other researchers on the social and economic effects (both positive and otherwise) of bauxite and kaolin mining at Aurukun, Napranum/Weipa and Old Mapoon in north-west Cape York Peninsula, has obvious relevance for any discussion of the threats posed by

extractive industries to biodiversity conservation, and the ways in which such concerns might be reconciled with poverty alleviation for local communities.

Research on the Islands of the Torres Strait

Archaeological research

The role of the Torres Strait as a bridge and barrier to both ecological and cultural exchange between New Guinea and the Australian mainland has been a focus of archaeological and palaeobotanical research over the last four decades (Walker 1972; McNiven and Quinnell in press). The Torres Strait defines and may in fact determine the boundary between horticulture in New Guinea and hunting and gathering in Australia (Harris 1995; Dewar 2003). The earliest archaeological evidence for human use of the Torres Strait islands dates to 3000 years ago, coincidental with the onset of widespread maritime movements elsewhere in the western Pacific (McNiven 2001).

The 'Western Torres Strait Cultural History Project' is a Monash University project, coordinated by Bruno David and Ian McNiven, with participation by Simon Haberle and Tony Barham of ANU. It focuses on two adjacent islands, Badu and Moa, located near the centre of the Strait. Badu and Moa are separated by a deep but narrow sea channel. The two islands have a similar geology, are of similar size, and possess similar natural resources. These two islands contain the southernmost occurrences of horticultural systems (practices common in PNG to the north, but totally absent in Australia); to the south are found island communities who practice only hunting and gathering. Badu is known ethnographically to have been an important horticultural centre, but Moa was not (Haddon 1904; Harris 1977). Past research on Saibai Island to the north of Badu and Moa has demonstrated that the substrate of the horticultural fields are less than 1200 years old on that island, but the antiquity of the alluvial and colluvial plains on the larger islands of Badu and Moa are unknown (Barham 1999). Local environments were thus dynamic during the period of known occupation of the region.

Ethnographic studies

When Europeans first arrived in the Strait (e.g. Jukes in 1847, MacGillivray in 1852, Haddon in 1898), distinctively regional economic, social and political practices were well established between island groups (including systems of alliance, warfare and trade). Numerous inter-connected Islander communities with specialist maritime fishing and hunting ways, along with totemic associations with both the land and the sea, had emerged. Inter-ethnic contact between Islander communities, mainland Papuans and Australian Aboriginal groups was well-established (Moore 1974, 1978; Lawrence 1990, 1994). Economic specialisation was apparent in dugong and turtle hunting and in horticultural practices on some islands, and archaeological traces of these practices are evident today (e.g. Haddon 1904; Harris 1977, 1979).

Sixty years were to pass after the 1898 Cambridge Anthropological Expedition before anthropologists again turned their attention to the Torres Strait Islanders. Jeremy Beckett conducted doctoral research in Torres Strait between 1958 and 1961 (Beckett 1964, 1987). The German ethnomusicologist Wolfgang Laade worked in Torres Strait in the early 1960s (see Laade 1973). A number of other anthropologists have worked in Torres Strait subsequently. Judith Fitzpatrick worked on Mabuiag Island in the late 1970s (Fitzpatrick-Nietschmann 1980); Maureen Fuary of James Cook University on Yam in the 1980s (Fuary 1991); and Richard Davis (now at the University of Western Australia) conducted doctoral research on Saibai in the 1990s (Davis 1998). All their theses contain some information relating to human-land-sea interactions. Doctoral research more specifically examining human-environment relationships has been undertaken by members of the evolutionary ecology school of anthropology: Douglas Bird (1996) and Rebecca Bliege Bird (1996) on Mer, and Raven (1990) on Boigu. Julie Lahn (ANU) has conducted fieldwork on Warraber and is currently completing her doctoral thesis.

Torres Strait Baseline Study (TSBS)

This project was established in 1989 when the Australian Government provided funds to the Torres Strait Baseline Study to monitor mining wastes from the Ok Tedi mine entering Torres Strait. Sediment and organic sampling was done to identify and measure heavy metals in the marine environment. The Great Barrier Reef Marine Park Authority (GBRMPA) ran the study between 1989 and 1993 (see Lawrence and Dight 1991; Lawrence and Cansfield-Smith 1991; Gladstone 1996; Evans-Illidge 1997). The reports show little evidence of direct mine-related contamination in Torres Strait waters, but as 98% of waste flows north along the coast of Gulf Province, further studies in the Gulf of Papua are a continuing concern.

Research on traditional fishing in Torres Strait

The CSIRO Division of Fisheries (based at Cleveland in southeast Queensland) has been conducting research on fisheries in the Torres Strait for more than a decade. This has resulted in creation of the Torres Strait Geographic Information System to systematically collate, analyse, and map places, environmental features and marine resources (e.g. CSIRO 1997). A significant part of the research program has been concerned with the traditional fishing practices of Islander communities (e.g. Johannes and MacFarlane 1991), with specific emphasis on turtle and dugong catches in the Protected Zone (Skewes et al. 2003).

Dr Colin Woodroffe (Wollongong University) and several postgraduate students have ongoing research on coral reefs and sand cays, especially Warraber. Drs Helene Marsh and Donna Kwan (James Cook University) have been active in Torres Strait (and Western Province PNG) for many years, conducting research on dugong and turtle populations. Kwan's doctoral thesis (2002) was based on research undertaken on Mabuiag between 1997 and 1999.

Torres Strait Regional Authority/Torres Strait Island Coordinating Council

A 'Marine Strategy for Torres Strait' (MaSTS) was established in 1991 by the Torres Strait Island Coordinating Council. Its aim, as defined in a MaSTS workshop held in September 1992 is 'to establish a comprehensive management framework which will permit optimum exploitation of the region's limited resource base, consistent with the needs of indigenous Torres Strait Islanders, sustainable development and minimal environmental disturbance' (Mulrennan et al. 1993: 4; see also Mulrennan et al. 1994).

This exercise convinced the Commonwealth Government that Islander communities were serious about environmental issues and keen to be active participants in marine management programs. As a result, funding was made available in 1995, under the Commonwealth Coastal Policy, for the establishment of a position within the Torres Strait Regional Authority to oversee the development of a 'Strategy for the Planning of Resource Integration in the Torres Strait' (SPRITS). This was to ensure that decisions on activities (e.g. conservation, shipping or mining) in and around the Torres Strait Protected Zone allow for lasting usage of the region's natural resources (e.g. traditional and commercial seafood stocks) for future generations. SPRITS seeks to ensure that the islands, reefs and seas are safeguarded, and Torres Strait links to the marine environment through their cultural beliefs, customs and traditional way of life are respected and maintained. Funding for this initiative has not been sufficient to support additional research. This is a missed opportunity because it was an Islander generated program that had widespread support. Additional funding could mean that a fully functional local environmental office could now be operational in the Torres Strait.

Torres Strait regional sea claim

In December 2000 Torres Strait Islanders lodged a native title claim over waters, reefs, and seabed in Torres Strait. Approximately one dozen anthropologists have been working with Torres Strait communities to provide evidence for the case. This research is in the context of legal proceedings and is confidential, but it is probable that some of this research will eventually be published. Results to date have significantly increased our understanding of customary marine tenure, traditional environmental knowledge and resource use in this region. Dr Nic Peterson (ANU),

along with PhD students Kevin Murphy (ANU) and Garrick Hitchcock (University of Queensland), have been involved in this work. (A recent court decision has excised land used for Commonwealth purposes before the Native Title Act but not after it.)

Research in Gulf and Western Provinces (PNG)

Ethnographic studies from the early colonial period

Four major ethnographic studies were completed in what are now Gulf and Western provinces during the early colonial period (before World War II), and all contain a good deal of information on indigenous resource management practices of that period. The Finnish anthropologist Gunnar Landtman wrote a monograph on the Kivai people of the Fly Delta (Landtman 1927), while the government anthropologist F.E. Williams wrote about the Keraki people of the Transfly region in Western Province (Williams 1936), the Koriki people of the Purari Delta (Williams 1924) and the Western Elema people of the adjoining Orokolo Bay in Gulf Province (Williams 1940). Schultze-Westrum (1965) and Filer (1991) provide reviews of additional ethnographic material from this period which relates to Western Province. Young and Clark (2001) have published an annotated collection of photographs taken by Williams. Specht and Fields (1984) have published an annotated collection of photographs taken by Frank Hurley in the early 1920s, which include a number of photographs taken in Gulf and Western Provinces.

Fieldwork in the late colonial period

During the late colonial period (1948-73), when the central highlands became the main focus of interest for ethnographic research in PNG, little attention was paid to the lowland areas of Western and Gulf Provinces, and the few anthropologists who worked in these areas were mainly concerned with the dynamics of social, economic and political change (e.g. Maher 1961; Hogbin 1964), rather than changes to indigenous resource management regimes. However, Fredrik Barth and Ray Kelly, who both worked in the remote northern extremities of Western Province in the late 1960s, were amongst the pioneers of a new wave of ethnographic interest in the societies of the so-called 'highland fringe' (see Barth 1975; Kelly 1977).

The Purari Delta, which was the site of Robert Maher's study of a post-war social movement, had not only been the site of an earlier ethnographic study by F.E. Williams (Williams 1924), but was also one of the main sites in which data was collected by an official survey of 'native nutrition' immediately after the end of World War II (Hipsley and Clements 1950). The continuity of scientific research in this area becomes significant in light of the amount of attention which it would again receive in the late 1970s as a result of the proposal to dam the Purari River (see below).

Detailed fieldwork-based studies in the post-colonial period

A number of anthropologists and other social scientists have engaged in lengthy periods of fieldwork in specific locations within the two provinces since 1973, normally as part of a doctoral research program, but are not thought to retain an active research interest in the area. Some were primarily focused on an understanding of indigenous resource management regimes (e.g. Hyndman 1979, 1984a, 1984b, 1990; Hyndman and Frodin 1980; Rhoads 1980; Baldwin 1982; Morauta 1982; Moraes-Gorecki 1983; van Beek 1987; Eley 1988; Brand et al. 1991; Schug 1995a, 1995b), while others included some account of material relationships between local communities and the natural environment in studies which dealt primarily with other aspects of social life (e.g. Jones 1980; Crawford 1981; Morauta 1982, 1984; Welsch 1982, 1994; Ayres 1983; Busse 1987, 1991; Depew 1987; Shaw 1990; Glazebrook 2001a, 2001b).

Ryutaro Ohtsuka and his colleagues and students from Tokyo University have been engaged in detailed studies of the human ecology of several communities in Western province, with a specific focus on the Gidra-speaking people of the Pahoturi River region, throughout the post-Independence period (e.g. Ohtsuka 1977, 1983, 1985, 1987, 1989, 1994; Kawabe 1983; Kuchikira 1990; Ohtsuka and Suzuki 1990; Suda 1990, 1993, 1996; Inaoka and Ohtsuka 1995; Ohtsuka et al.

1995; Akimichi 1998). It is not clear whether this group of Japanese scholars still maintain an active research interest in this area.

Peter Dwyer and Monica Minnegal (formerly of the University of Queensland, now at the University of Melbourne) have been engaged in research on almost every conceivable aspect of human ecology and indigenous resource management among the Kubo people of the Strickland River since 1986. Their corpus of published work already constitutes the most detailed account of relationships between a local community and its natural environment in the literature on Western and Gulf provinces (e.g. Dwyer and Minnegal 1990, 1991, 1992, 1994, 1995, 1997, 1998, 2000; Minnegal 1994; Minnegal and Dwyer 1998, 2000).

Pierre Lemonnier and Pascale Bonnemère of the French National Centre for Scientific Research (CNRS) have been engaged in a long-term ethnographic study of the Ankave-Anga people in the Kaintiba area of Gulf Province since 1982. In the late 1990s, this research was part of a program funded by the European Union on the 'Future of the Tropical Forest Peoples'. Many of the resulting publications are in French (and not cited here), but some of those in English deal with various aspects of the indigenous resource management regime (e.g. Bonnemère 1993, 1998; Lemonnier 1993, 2001; Bonnemère and Lemonnier 2002).

A number of other anthropologists have worked in the area for variable periods of time, and are still thought to retain an active interest in research on local resource management regimes. Bruce Knauff (Emory University) originally worked with the Gebusi people in the Nomad area of Western Province in the early 1980s, and has recently conducted a second period of fieldwork in the same area with greater emphasis on resource management and development issues (Knauff 2002). David Lawrence (now associated with the ANU) has been engaged in studies of the Kiwai people of the Fly River Delta since 1985 (see Lawrence 1989a, 1989b, 1995). Harriet Whitehead (Duke University) has been working with the Seltaman people of the Murray valley, in the far north of Western Province, since 1987 (Whitehead 2000). Alison Dundon (ANU) has worked amongst the Gogodala people in the Balimo area of Western Province since 1995 (Dundon 1998). Garrick Hitchcock (currently at the ANU) is completing a doctoral thesis on the historical ecology of the peoples of the Torassi or Bensbach River area in Western Province, adjacent to the Indonesian border. Joshua Bell (Oxford University) is likewise completing a doctoral thesis on the relationship between traditional culture and resource development in the Purari Delta.

Baseline studies for the Purari River (Wabo) Hydroelectric Scheme

In the late 1970s, the PNG Office of Environment and Conservation commissioned a series of baseline studies of the area likely to be affected by a proposed hydroelectric scheme on the upper reaches of the Purari River (which was never actually constructed). Most of these studies deal directly or indirectly with relationships between local communities and the natural environment (e.g. Liem and Haines 1977; Warrillow 1978; Haines 1979a; Hall 1979; Petr 1979, 1980; Alpers 1980; Gwyther 1980; Stevens 1980; Pernetta and Burgin 1980; Toft 1980; Poraituk and Ulijaszek 1981; Ulijaszek and Poraituk 1981), and some of the researchers subsequently converted their material into academic publications (e.g. Haines 1979b; Ulijaszek 1982; Petr 1983). Stan Ulijaszek (now at the University of Cambridge) has since maintained a research interest in the area (Ulijaszek 1991, 1997, 2001), and has recently supervised a doctoral dissertation on patterns of nutrition and disease among the Kamea people in the northern part of Gulf Province (King 1999).

Social and environmental studies associated with development of the Ok Tedi mine

Since the passage of the original *Mining (Ok Tedi Agreement) Act* in 1976, an enormous variety of baseline, impact and monitoring studies have been undertaken on the Ok Tedi mine, located in the far north of Western Province. Much of this work has been concerned with the direct impact of the mine on the physical environment, most notably in respect of the discharge of mine wastes and tailings into the Fly River system. However, some of it has dealt specifically with long- and short-term changes to the resource management practices of local communities in the impact area.

One notable example is the work of David Hyndman (now retired from the University of Queensland), whose doctoral research on the ‘cultural ecology’ of the Wopkaimin people living in the immediate vicinity of the current mine site was conducted well before the start of mine construction in 1982 (Hyndman 1979, 1984a, 1984b, 1986). During the 1980s, Hyndman became involved in a number of inter-disciplinary baseline and monitoring studies commissioned by Ok Tedi Mining Ltd (Frodin and Hyndman 1982; Hyndman 1982; Pernetta and Hyndman 1982; Hyndman et al. 1989), but then became one of the most vocal critics of the mine’s impact on the lifestyles and subsistence of the Wopkaimin people and members of other mine-affected communities (Hyndman 1994).

A similar case is that of Stuart Kirsch (University of Michigan), whose original doctoral research on the Yonggom people of the lower Ok Tedi River was neither concerned with the impact of the mine nor focussed on issues of indigenous resource management (Kirsch 1991). Kirsch published some critical observations on the impact of the mine at the conclusion of his doctoral fieldwork (Kirsch 1989), was then part of a team of consultants engaged by OTML to monitor the impact of a downstream compensation package (Kirsch 1995), but finally adopted the same position as Hyndman (Kirsch 1997a).

After the World Health Organisation had been invited to conduct baseline studies of population health in the North Fly region (Taukuro 1980; Nurse 1990), the mining company commissioned the University of PNG to undertake further studies of health and nutrition amongst the local Wopkaimin community from 1982 (e.g. Cattani et al. 1983; Ulijaszek and Pumuye 1985; Ulijaszek and Welsby 1985; Lourie et al. 1986; Hyndman et al. 1989; Ulijaszek et al. 1989, 1994). Medical staff employed by OTML continued this program of research, and one of them produced a doctoral dissertation on the epidemiology of malaria and filariasis in the immediate area of impact (Schuurkamp 1992).

The geographer Richard Jackson (now an independent consultant) has been involved in the planning and monitoring of the Ok Tedi project since 1977, but most of his publications and reports touch only lightly on relationships between local communities and the natural environment. The most significant exceptions are a study of voluntary resettlement prior to mine construction (Jackson 1979) and an unpublished survey of the lower Ok Tedi villages conducted for the mining company in 1998 (Jackson 1998).

Pamela Swadling (now resident in Canberra) published a review of archaeological evidence relating to human settlement and resource use in the Ok Tedi impact area for the PNG National Museum in 1983 (Swadling 1983). Simon Haberle provided background data on archaeological and palaeoenvironmental evidence to the PNG National Museum (Haberle and Fox 1987). This work complements the ongoing program of research on the historical ecology of the Torres Strait islands (see above).

In 1991, OTML’s Environment Department commissioned the University of PNG to investigate the impact of the Ok Tedi/Fly River Development Trust on the people of downstream villages for whom it was meant to be providing some compensation for the environmental damage caused by the mine. Colin Filer (now at the Australian National University) and John Burton (now working for the Torres Strait Regional Authority) coordinated a series of 12 reports to OTML over the following four years. These reports were mainly concerned with the social relationship between the mining company and local communities, but some of them contained material on the impact of the mine on local management and consumption of natural resources (Burton 1991, 1993, 1995; King 1995; Lawrence 1995; Tapari 1995). Aside from the initial review of existing literature (Filer 1991), the only report to have been published is Kirsch’s survey of the lower Ok Tedi communities (Kirsch 1995).

With establishment of the Ok Tedi Development Foundation in 2001, and partly as a result of the food shortages experienced as a result of the nationwide drought in 1997, research sponsored by OTML has recently begun to focus on the problems of food security which might arise with the

closure of the mine and the resulting loss of cash incomes to local communities in Western Province (see Wissink et al. 2001).

Western and Gulf Coastal Zone Management Plan

This project originated in a 1989 PNG Department of Environment and Conservation concept for a coastal zone management project for Western Province. The PNG government approached AIDAB (now AusAID) for assistance with such a project in 1992. A series of feasibility studies and project design documents were commissioned by the aid agency from 1992 to 1998, some of which contained a significant amount of ethnographic and environmental data from the South Fly and Torres Strait areas. The geographical focus was narrowed to the coast zone of Western province, but the project was never approved for implementation, mainly because of concerns over the ability of the Fly River Provincial Government to assist in its administration and execution.

Social and environmental studies associated with oil and gas developments in Gulf Province

Since 1992, oil from the Southern Highlands Province has been exported through a pipeline which follows the course of the Kikori River in Gulf Province. At the time when exports began, the operator of the Kutubu oil project, Chevron Niugini, commissioned the PNG National Museum to produce a study of the traditional way of life of people living in the vicinity of the original oil field and the pipeline route (Busse et al. 1993). The main author, Mark Busse, who did most of his previous research in Western Province, is now at the University of Auckland.

The *Oil and Gas Act* of 1998 requires oil companies to commission 'social mapping studies' of any areas in which they have an exploration or development interest. Laurence Goldman (University of Queensland) has conducted a series of social mapping studies of this kind over the past six years, and some of these have covered parts of Gulf and Western Provinces (Goldman 1998, 1999). These studies are primarily concerned with settlement histories, local social organisation, and the territorial boundaries of local communities.

Impact of large-scale logging operations on local resource management regimes

Despite the spread of large-scale logging operations through both provinces over the course of the last decade, there has been very little research on the way that these operations affect the subsistence systems of local communities. Anthropologist Michael Wood (James Cook University) has been working in and around the northern part of what is now the Wawoi-Guavi timber concession in Western province since 1975, with specific reference to the negotiation and impact of logging operations since 1992, but his work is more concerned with political and ideological issues than with human ecology (see Wood 1996). Some research on local forest management practices was undertaken in the Ihu area of Gulf Province as part of a Landowner Awareness Project funded by the German aid agency GTZ in the mid-1990s, but the results have not yet been published.

PNG Land Management Project

In 1991, Bryant Allen, Michael Bourke and Robin Hide of the Human Geography Department in the Research School of Pacific and Asian Studies at the Australian National University embarked on a nationwide survey of PNG 'agricultural systems', which essentially meant local and indigenous food cropping systems. This was undertaken in partnership with the PNG Department of Agriculture and Livestock and the University of PNG, with support from the Australian International Development Assistance Bureau (now AusAID). The results of this work were published in a series of volumes (one per province) that were revised and reprinted in 2002 (see Allen et al. 2002; Hide et al. 2002). The findings of the survey were translated into GIS format, and constitute the best available national dataset on which to base any systematic assessment of conditions and trends in local or indigenous resource management regimes.

The Mapping Agricultural Systems Project has since evolved into the PNG Land Management Project, which is progressively incorporating additional data on socio-economic development issues

into the dataset as it becomes available. The current focus of the work is on the spatial relationship between poverty, food security, rural infrastructure, and agricultural potential. Information on local fishing and forest management practices does not presently exist in a form which would enable it to be incorporated into the dataset in any systematic way, but it may be possible to achieve this kind of elaboration in specific areas of the country.

The Land Management group has also compiled an exhaustive (Endnote) bibliography of all literature containing any discussion of indigenous food cropping systems in PNG. This is presently being revised and updated.

Robin Hide, one of the original members of the MASP team, is currently completing a separate study of the indigenous pig population of PNG which is to be published by the Australian Council for International Agricultural Research (Hide 2003). This work includes a review of the role of pigs as a vector for the transmission of disease across the boundary between Indonesia and PNG, especially through the southern part of Western Province.

Lakekamu Integrated Conservation and Development Project

The upper reaches of the Lakekamu River basin, on the border between Gulf and Central Provinces became the site of an experimental ICAD Project during the second half of the 1990s. This was designed and implemented by a consortium of NGOs, and funded to a significant degree by the Biodiversity Conservation Network. A number of scientific studies were carried out in the area (see Kirsch 1997b; Mack et al. 1998; Kalwij and de Koning 2000), but the project was 'mothballed' as a result of conflict between the small and scattered local communities in the area and the end of significant external funding.

Transfly Ecoregional Action Plan

WWF began work in the Transfly region in 1998, as part of its Tropical Wetlands of Oceania Program. Work was initially coordinated out of the organisation's Darwin office, because of the general aim of promoting synergies between three regional Ramsar sites: Kakadu National Park in the Northern Territory; Wasur National Park in West Papua; and Tonda Wildlife Management Area in the Western Province of PNG. These three sites are now covered by the Tri-National Wetlands Agreement between the governments of Australia, Indonesia and PNG. However, WWF has since incorporated its work in Wasur and Tonda into the Transfly Ecoregional Action Plan, which is meant to cover a much wider region on both sides of the border between Indonesia and PNG. Work in this region is now coordinated out of the Madang office of the WWF South Pacific Program. Research on the PNG side of the border has so far been primarily focused on biodiversity values (but see Bove 2000, Stronach 2000).

Millennium Ecosystem Assessment

Staff of the Australian National University and the University of PNG are presently organising an assessment of Coastal, Small Island and Coral Reef Ecosystems in PNG as a sub-global assessment within the Millennium Ecosystem Assessment. This will involve a review of existing data and literature relating to coastal ecosystems and production systems in all provinces of PNG, including Gulf and Western, but there currently no plans to conduct any fieldwork in either province as part of the assessment.

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