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**Dragon Tourism in
Komodo National Park, Indonesia:
Its Contribution to Conservation &
Local Development**

Matthew J. Walpole

**A thesis submitted for the degree of PhD in Ecology,
Durrell Institute of Conservation & Ecology,
University of Kent**

November 1997

**Loh Liang Bay from the Summit of Gunung Ara, Komodo Island,
Komodo National Park, Indonesia.**



ABSTRACT

Tourism is the world's largest industry and is widely promoted as a panacea for sustainable development in developing countries. Nature tourism to protected areas is viewed as an ecologically sustainable means to offset the costs of annexation for governments and local communities. The rapid development of 'ecotourism' as a benign and beneficial form of nature tourism has occurred with little examination of its true impact.

This study adopted a multi-disciplinary approach to examine whether nature tourism based on Komodo National Park (KNP), Indonesia, conformed to the accepted definition of ecotourism as ecologically, economically and socially sustainable at a local level. It also examined whether different types of tourist have different impacts on conservation and local development.

The findings suggest that tourism to KNP does not achieve the ideals of ecotourism. Although ecological disturbance was minimal, the financial contribution to conservation barely offset the costs of tourism for KNP, and could be substantially increased by raising entrance and other fees. Contributions to the local economy were small relative to total expenditure on visits to KNP, and benefits accruing to village communities within KNP, which bear the greatest opportunity costs, were negligible. Independent tourists contributed the most to the local economy, whilst package tourists contributed very little. Cruise passengers, the most affluent visitors to KNP, contributed virtually nothing due to the enclave nature of cruise operations.

The limitations of current tourism development in and around KNP reflect traditional patterns of tourism evolution rather than a reorientation towards ecotourism. Continued evaluation will be necessary to ensure that future development adheres to sustainable principles. This study has provided a template for rapid, cost effective evaluations of nature-based tourism which could be implemented elsewhere.

Keywords: Komodo National Park, ecotourism, local development, sustainability.

ACKNOWLEDGEMENTS

This study formed part of a wider comparative study of protected area tourism funded by the Department for International Development (DFID, formerly ODA) of the British Government. Sincere gratitude is expressed to DFID for supporting this research, to the Darwin Initiative for financial assistance for a Workshop on Sustainable Tourism and Biodiversity held in Labuan Bajo, April 1996, and to the Durrell Institute for Conservation and Ecology (DICE) for the provision of a stipend for the full duration of the study.

This research could not have been carried out without the co-operation of the director, Drs Johannes Subijanto, and staff of Komodo National Park. Particular thanks are owed to the following: Agus Marhadi for logistic assistance during field visits, and for managing the survey budget; Ibu Dede for translating questionnaires and workshop presentations; Muhidin for assisting with data collection in KNP, particularly the visitor questionnaire and the collection of park visitor statistics; Agus Haryanta and Alo Sahu for assisting with field surveys in the park. Sincere gratitude is expressed to Irs. Sudibyو (PHPA, Bogor) for advice and assistance during initial visits to KNP. Sincere thanks also to Paul Boleng, head of the Labuan Bajo tourism office, for providing valuable assistance with the Labuan Bajo visitor survey.

Dr Harold Goodwin and Professor Nigel Leader-Williams provided invaluable support and advice whilst supervising this research. In addition, thanks are due to all those who contributed to the wider DICE/ODA project, particularly Ivan Kent, Kari Ward and Dr Kim Parker, and to the DICE secretariat for logistical support throughout. Particular thanks are due to Annette Huggins for vital and invaluable assistance with maps, photographs, printing and general sanity during the final stages of the completion of this thesis.

Finally, thank you to all the family, friends and colleagues, who have not been named in person, for all their support and encouragement throughout this study.

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1. The History of Conservation and Tourism

1.1 Introduction

Tourism has been linked with protected areas since the formulation of the national park idea over a century ago. Today, 'ecotourism' is one of the fastest growing sectors of the tourism industry (Ceballos-Lascurain, 1991; Giannecchini, 1993; Goodwin, 1996), and one of the major themes of biodiversity conservation (WRI/IUCN/UNEP, 1992; McNeely, 1993). This chapter documents the parallel and combined histories of tourism and protected areas, and examines the evolution of concepts of sustainability in tourism and conservation, culminating in the emergence of the concept of ecotourism.

The painter George Catlin is often claimed as the progenitor of the national park idea. In 1832, he commented on the possible salvation of the disappearing wildlife and native people of South Dakota, hoping that

'[they] might in future be seen (by some great protecting policy of government) preserved in their pristine beauty and wildness, in a magnificent park, where the world could now see for ages to come, the native Indian in his classic attire, galloping his wild horse, with sinewy bow ... What a beautiful and thrilling specimen for America to preserve and hold up to the view of her refined citizens and the world, in future ages! *A nation's park*, containing man and beast, in all the wild and freshness of their nature's beauty!' (Catlin, 1989:263, quoted in Coates, 1993:27).

Forty years later, in 1872, the first national park was established in Yellowstone, Wyoming, and it is generally agreed that this American model has been exported to the rest of the world (Macewen and Macewen, 1982; Nash, 1982; MacKinnon *et al.*, 1986; MacKenzie, 1988). Yellowstone and the other early national parks bore little resemblance to Catlin's vision of cultural and ecological preservation. It was not until well into the Twentieth Century that ecological concerns became a valid rationale for protected areas, and the concerns of local people have only very recently become integrated with protected area conservation.

The protected area concept has undergone a considerable evolution, encompassing monumentalism and scenic nationalism, commercialisation, wildlife preservation and the

conservation of biodiversity, and eventually a recognition of the need for greater links with surrounding communities. Protected areas are today viewed as the cornerstone of biodiversity conservation, and play a pivotal role in sustainable development. At each stage in the development of protected area conservation, tourism has emerged as a key component for continued progress.

Section 1.2 examines early themes in protected area conservation. Conservation from the outset has been characterised by a conflict between preservationist and utilitarian ethics. This section examines the basis of this division and the role of tourism as mediator. Once the national park concept was established in America in the first half of the Twentieth Century, it began to spread worldwide, particularly within colonial parts of the developing world. Again, tourism played an important role in determining the spread of new protected areas. This is explored in **Section 1.3**. Modern themes in conservation link protected areas with local development via the generation of sustainable benefits for neighbouring communities. Here again tourism has emerged as a key mechanism by which protected areas can fulfil their goals. This is discussed in **Section 1.4**. As conservation has evolved, so tourism has developed and assumed aspects of modern conservation and development ideology. One result is the concept of ecotourism. The growth and development of tourism towards the concept of ecotourism is explored in **Section 1.5**. The key issues of the chapter are highlighted in **Section 1.6**, followed by a statement of the objectives of this study (**Section 1.7**).

1.2 Early Themes in Conservation: Preservation vs. Utilisation of American Wilderness

Protected areas are a preservationist tool, a legal designation restricting human exploitation in order to preserve aspects of an area in perpetuity. However, the term conservation, which is often equated with biological preservation, originated in the field of resource management. It was a term used to describe a philosophy of utilisation rather than the prohibition of use. Modern conservation embodies both preservation and utilisation, but from the outset there has been a conflict of interest between those who believe in preservation from the inherently destructive nature of man and those that believe that 'sustainable' utilisation is both necessary and achievable.

1.2.1 Preservationism and the Birth of National Parks

Preservationism has existed since antiquity, but until recent centuries its enjoyment was the sole privilege of the ruling classes. Common throughout Medieval Europe were royal hunting reserves stocked with game. The term 'park' actually stems from this usage (Runte, 1987). The French and American revolutions, and their associated ideologies, led to the democratisation of royal parkland for the enjoyment of the proletariat across Europe. In addition, the anti-urban sentiment associated with the harsh realities of post-industrial revolution living, and the rise of Romanticism, helped to popularise nature in the eyes of the public (McHenry and Van Doren, 1972; Nash, 1982; Runte, 1987). This resulted in a prolific development of urban parks in Europe and subsequently the Eastern United States from the mid nineteenth century.

In America, the transition from the construction of landscaped parks to the protection of natural landscapes was in part due to the realisation that newly-discovered natural wonders of the Western frontier were under threat from private exploitation. America had already witnessed the massive development and commercialisation of Niagara Falls by private entrepreneurs to cash in on the scenic value of the spectacle, which by the mid-nineteenth century was attracting tens of thousands of visitors from home and abroad. The ruination of the scenic experience by uncontrolled development right up to the rim of the Falls was commented on by many overseas visitors, who criticised the patriotism of the American people for allowing such destruction of their natural heritage (Runte, 1987).

This criticism struck at the nation's pride at a time when it was struggling to establish its cultural identity. Independence from Britain left America without an established past to rival the artistic, literary and architectural traditions of Europe, a fact of which it was acutely conscious. The genocide perpetrated by the colonists upon the native American people had also robbed them of a cultural history. However, the natural wonders emerging from the new continent appeared to offer compensation for a nation without a cultural heritage. Niagara had been the continent's only claim to scenic superiority over Europe until the western frontier was pushed back after 1850. With the discovery of new Western wonders such as Yosemite Valley, the nation was determined not to repeat the mistakes of Niagara.

The romantic appeal of the Western frontier, the guilt of the Eastern population over the desecration of Niagara and the scramble for private appropriation of Western wonders, and the need for some form of monumentalism on which to base national pride, conspired to

provide the inspiration for wilderness preservation (Runte, 1987). The first resolution of the 'national park' idea appeared in 1864 when the Yosemite Act was passed by Congress to preserve the Yosemite Valley and a grove of Sequoia redwoods 'for public use, resort and recreation', 'inalienable for all time'. Although the term 'national park' was not officially used until the designation of Yellowstone eight years later, Yosemite was, in all but name, the first national park.

1.2.2 Utilitarian Conservation: a Threat to National Parks

'The first great fact about conservation is that it stands for development ... The first principle of conservation is development.' (Pinchot, 1910:42, quoted in Coates, 1993:20).

The defining features of the original national park ideal in America were threefold; first and foremost, that they should be scenic wonders worthy of national pride; secondly, that they should be open to the public for recreational use, and; thirdly, that they should be 'inalienable for all time'. However, their foundation was based primarily on the 'worthless lands' hypothesis, this being that proposed areas (usually high montane) were of no material value and that designation would not impede the economic progress of the nation (Runte, 1987).

Towards the end of the nineteenth century it became apparent that natural resources were limited, whilst consumption was growing. In the face of rampant deforestation and commercial overexploitation of resources, a new philosophy of use emerged. Professional natural resource managers argued in favour of the efficient use and manipulation of all natural resources to achieve greater efficiency without depriving future generations (Hays, 1959). This philosophy has become known as 'utilitarian conservation', proponents of which viewed scenic preservation as an indefensible waste of potentially valuable resources.

The utilitarians, armed with the Forest Reserve Act (1891) and two new government bureaux (the Forest Service, 1905 and the Reclamation Service, 1902), began to make inroads into the national parks in the early 1900s, and a number were reduced in size as peripheral areas were reclaimed for timber, minerals or agricultural use. However, the ultimate failure of the worthless lands hypothesis came in 1913, when the Hetch Hetchy Valley at the heart of

Yosemite National Park was deproclaimed to make way for a hydroelectric scheme (Nash, 1982; Runte, 1987).

1.2.3 Tourism, Commercialisation and The National Parks Service

The Hetch Hetchy controversy clearly illustrated that the preservationists did not yet have a strong enough rationale with which to defend national parks in America. In an attempt to place utilitarian value on national parks, some proponents argued that national parks were good for the spirit of the workforce, that inefficiency was a direct symptom of unfavourable surroundings and a lack of psychological well-being which could be remedied by wilderness:

'Thousands of tired, nerve-shaken, over-civilised people are beginning to find out that going to the mountains is going home; that wilderness is a necessity; and that mountain parks and reservations are useful not only as fountains of timber and irrigating rivers, but as fountains of life' (Muir, 1898, quoted in McHenry and Van Doren, 1972).

'somehow we must get you to see that the man whose efforts we want to conserve produces the best effort and more effort in agreeable surroundings; that the preservation of forests, water powers, minerals and other items of national prosperity in a sane way must be associated with the pleasure to the eye and the mind and the regeneration of the spirit of man' (McFarland, 1909, quoted in Hays, 1959:195).

A more explicitly economic argument was the clear evidence of revenues generated by scenic attractions in Europe, particularly Switzerland:

'[if] we must consider [the national parks] from the commercial standpoint, let it not be forgotten that Switzerland regards its scenery as a money-producing asset to the extent of some two-hundred million dollars annually.' (Chamberlain, 1910, quoted in Runte, 1987:83).

The economic argument gained plausibility because it coincided with the beginnings of the leisure society which popularised travel. However, to entice the American public to remain on home soil for its scenic experiences demanded the development of improved access to, and facilities within, national parks. The impetus for this came in the form of an alliance with the

railroads, the industry most likely to benefit from increased park visitation. The railroads actively promoted scenic preservation and helped to raise public support and pressure for a bureau of national parks equivalent to the utilitarian Forest and Reclamation Services.

The institutionalisation of the national park idea within the political and legal framework of American government was finally achieved in 1916. The National Parks Service was established on August 25th, its legal mandate to 'promote and regulate the use' of national parks in line with their fundamental purpose, that being

'to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.' (Grosvenor, 1966:2; Runte, 1987:104).

With the establishment of the National Parks Service, attracting tourists became the principal operational objective of national parks. The immediate goal of the service was to 'build a constituency for expansion of the system' (Mitchell, 1994). The successful 'See America First' campaign was a joint marketing initiative with the railroad companies, designed to appeal to cultural nationalism and to persuade the American public to take their scenic holidays at home rather than in Europe. It was the start of an expansion of park visitation throughout the century that reached 270 million visitors by 1994 and is predicted to reach 500 million by the year 2010 (Mitchell, 1994). It also served to stimulate the promotion of recreation as a non-material value of national forests (Nash, 1982), and subsequently wildlife refuges (DiSilvestro, 1993).

1.3 The Global Expansion of Protected Areas

1.3.1 Hunting and Conservation in Africa

The origins of modern conservation in the developing world can be traced to the perceived environmental crises in India and the Cape colonies of South Africa in the mid-nineteenth century (Grove, 1987). Rapid deforestation and soil erosion caused by increased flooding alerted some observers to the impact that colonial resource exploitation was having on the environment. The earliest themes to be promoted were twofold; the scientific and medicinal values of specialised flora threatened by deforestation, and the linkage between deforestation

and rainfall decline, with the resultant occurrence of famine in India. The first forest conservation policies in India surfaced in 1847, whilst the first legislation in the Cape, the 'Forest and Herbage Preservation Act', was passed in 1859. The conservation concept at this time was clearly in the utilitarian vein, focusing on 'improvement' of the environment and resource management.

A second and ultimately more important theme, particularly in Africa, was that of wildlife decline in the face of massive hunting pressures (MacKenzie, 1987). Commercial hunting for ivory and skins, subsistence hunting, and eventually sport hunting by the colonial elite, each contributed to the decline of game. The additional pressures of the rinderpest epidemic spreading south from Eritrea also took its toll (MacKenzie, 1987; Homewood and Rodgers, 1991). The decline in game resulted in the extinction of two species, the blaubok and quagga, and the severe endangerment of the southern white rhino, bontebok and white-tailed gnu. These disappearances, coming at the same time as the American bison was seen to be almost annihilated, led colonial sport hunters to become the biggest proponents of interventionist conservation policy, leading pressure groups to promote legislation for the creation of Game Reserves (MacKenzie, 1987; MacKenzie, 1988).

Game reserves were proclaimed from the late nineteenth century onwards. Sabi Game Reserve (later to become Kruger National Park) was established in 1898, and a dramatic recovery of bushveld and game was witnessed in the space of a decade. However, as with the early national parks in America, game reserves received opposition on the grounds that they impeded colonial economic progress. Again, the emergence of tourism proved to be the best economic defence of protectionist policy.

1.3.2 From Game Reserves to National Parks

The drafting of the 1933 'Agreement for the Protection of the Flora and Fauna of Africa' at the International Conference on African Wildlife marked the transition of protected area conservation in Africa from game reserves to the creation of national parks, using the model developed in America (Boardman, 1981; Nash, 1982; MacKenzie, 1988). National parks were distinguished from game reserves in four principal ways; (1) they were established in perpetuity, (2) their management was often separated from direct government control, (3) the ultimate objective was that they should be self financing, and (4) they were established both for flora and fauna preservation *and* for public recreation (MacKenzie, 1988).

'Reserves were the policy of the hunter-naturalists, a by-product of game legislation designed to limit social access to hunting ... National parks, despite their early start in the United States, were designed for an age of tourism, the era of the motor car and the camera' (MacKenzie, 1988:264).

The railway passing through the Sabi Game Reserve was soon stopping to provide passengers with game viewing opportunities. The economic incentive of tourism proved a forceful argument for greater government protection of the area, and in 1926 the Sabi Game Reserve was transformed into Kruger National Park. Tourist development started immediately, and by 1938 there were 38,000 visitors in 10,000 cars, 1200 miles of road, six entrance gates and 14 visitor camps. National parks blossomed in South Africa throughout the 1930s, with considerable interaction between African and American parks and wildlife preservation groups.

1.3.3 The Expansion of Protected Area Networks in Africa

As protected areas multiplied, so the variation in terminology expanded. Not all 'national parks' in the American tradition were named as such, and not all national parks conform to the definition exported from America. Albert National Park in Belgian Congo was the first to be established in Africa, in 1925. However, this was more of a sanctuary/reserve than a conventional national park, being very small in area, closed to visitors, and established with the sole aim to protect the mountain gorilla population. Conversely, the Masai Mara National Reserve in Kenya conforms to the traditional definition of national park despite its name.

In an effort to consolidate national and regional variation in terminology, IUCN established a list of national parks and equivalent reserves in the 1960s. This was later divided into a series of standard categories, the latest manifestation of which recognises six categories based upon degree of protection and level of permitted use (IUCN, 1994). The majority of protected areas conform to *Category II: National Park*. In Africa, after 1933, many former game reserves were upgraded to the equivalent of national parks.

Clearly, tourism was one of the principal motivations for protected area development in Africa. The earliest expansion of the protected area network occurred in South Africa, where an urban population with private transport existed, and which was already located on an

international tourist trail. The development of protected areas in east African colonies was slower due to the lesser extent of urbanisation and foreign visitation there. In west Africa, with a small European population, a reputation as an unhealthy area, and a dense African population with traditional hunting rights, gazettelement was virtually impossible (MacKenzie, 1988).

By the 1960s, when many former colonies gained their independence, national parks and equivalent reserves had been established throughout east and southern Africa. However, there was a fear that, perceived as white men's playgrounds by the indigenous population, they would suffer after independence. Again, the economic value of international tourism was used as the rationale by conservationists in trying to persuade African leaders to continue to support protected areas (Runte, 1987; MacKenzie, 1988). It was a powerful incentive, and wildlife tourism based upon protected areas soon became the second or first source of foreign exchange for many African nations (Nash, 1982):

'I personally am not very interested in animals. I do not want to spend my holidays watching crocodiles. Nevertheless, I am entirely in favour of their survival. I believe that after diamonds and sisal, wild animals will provide Tanganyika with its greatest source of income. Thousands of Americans and Europeans have the strange urge to see these animals' (Julius Nyerere, ca.1961, quoted in Nash, 1982: 342).

1.3.4 Conservation in Asia

Protected area conservation in Asia, as in Africa, arose primarily from concern over excessive wildlife declines. In Malaya, Ceylon and India, early anxieties over hunting were first translated into legislative action in the 1880s, some of which stemmed from existing forest policy. However, effective legislation which included reference to the proclamation of protected areas did not materialise until the 1920s and 1930s (MacKenzie, 1988). The 1933 International Conference on African Wildlife also served to inspire the creation of national parks and equivalent reserves in Asia. The first in India was Hailey National Park (1934, renamed Corbett National Park in 1957), and others followed elsewhere in south Asia later in the decade (Singh, 1985a).

In Malaysia, game reserves established prior to 1939 provided a significant foundation on which to build a protected area network (Khan, 1985). However, in general the development

of protected areas in Asia occurred later than in Africa. Protected areas in Asia tripled between 1962 and 1982, and the number is still increasing (Ranjitsingh, 1984; Singh, 1985b). Development of conservation legislation in the 1970s and 1980s aided the spread of protected areas across most Asian states (Khan, 1985; Khan, 1985; Lechoncito, 1985; Mahat, 1985; Upreti, 1985; Vejaboosakorn, 1985; IUCN, 1992). More recently, political stability has aided the development of a conservation agenda in Vietnam and Lao (Quy, 1985; IUCN, 1992).

Tourism has been viewed as an economic panacea in Asia as in Africa (Pye and Lin, 1983). However, the emphasis has been principally on cultural and beach tourism rather than nature tourism. This may be due to the fact that Asian parks are often smaller, with less visible wildlife than their African counterparts. Despite this, protected areas are becoming more important tourist destinations in Asia as access and infrastructure improves.

1.4 Modern Themes in Conservation: People and Parks

1.4.1 Biological Preservation

In the last three decades, with the general rise in environmental awareness, conservation biology has emerged as a scientific discipline. Biological preservation became the principal rationale for the establishment of protected areas, which rose dramatically in number during the 1970s (Leader-Williams *et al.*, 1990). In some ways biological preservation is the global equivalent of nineteenth-century American scenic preservation, with parks in developing countries an issue of government pride, and a romantic perception of vanishing wilderness, 'the myth of wild Africa' (Adams and McShane, 1992), driving international concern. There has been an effort to plan the establishment of protected areas on a more scientific basis (Leader-Williams *et al.*, 1990), taking into account biogeographic theory (Diamond, 1975), population ecology and genetics (Soule, 1986; Soule and Simberloff, 1986), and global coverage (Udvardy, 1984; Thorsell, 1985). However, theory has proved difficult to put into practice in light of political and economic realities in the developing world (McNeely, 1992). It has also been recognised that protected areas are no longer protected by their boundaries alone (Garratt, 1984; DiSilvestro, 1993).

1.4.2 Integrated Conservation and Development

One of the overriding principles of protected area establishment, in contradiction to George Catlin's early vision (Section 1.1) has been the absence of human settlement. Early American National Parks were established in montane wilderness areas at a time when the native people had been almost annihilated by European settlers. In Africa, the establishment of protected areas resulted in a progressive separation of local people and wildlife, either because protected areas were established in areas devoid of human habitation, or because native people were repatriated elsewhere. Human activities were deemed incompatible with wilderness preservation, and the presence of local people was considered to interfere with the wilderness experience which foreign tourists came to expect (Adams and McShane, 1992). As such, the exclusion of local people from areas which they had previously inhabited or depended on for resources was common practice.

'When the whites first arrived in this area, they thought we were wild animals and chased us into the forest. Now that they have found out that we are people they are chasing us out again.' (Oriek hunter-gatherer, Mau Forest, Kenya, 1992, quoted in IIED, 1994b).

In the last two decades it had been recognised that the preservationist approach of excluding local people from protected areas has served to heighten conflict between conservation and communities rather than ameliorate it (Machlis and Tichnell, 1985). Distributional inequalities have resulted in a situation whereby local people living adjacent to protected areas bear substantial costs whilst receiving little or no benefit (Munasinghe, 1992; Wells, 1992). It has become imperative for the continued survival of protected areas to demonstrate that conservation can serve the economic and cultural interests of local people rather than cause them hardship (Brown and Wyckoff-Baird, 1992).

The publication of the World Conservation Strategy (IUCN/UNEP/WWF, 1980) marked a return to a utilitarian ethos in protected area conservation and, more significantly, the start of a new era of 'conservation with a human face' (Bell, 1987). It stressed the links between conservation and development, and called for the sustainable utilisation of natural resources, acknowledging that parks are protected *for* the people, not against them (Talbot, 1984; Western and Pearl, 1989). This has resulted in an increasing focus on economic rationales for protected areas (WCED, 1987; McNeely, 1988). It has also seen the adoption of a more

pragmatic approach to conservation that recognises the needs of local people (Anderson and Grove, 1987; Adams and McShane, 1992; Bonner, 1993). The major theme of the IIIrd World Congress on National Parks and Protected Areas, held in Bali in 1982, was that people are a part of nature, and that protected areas need to adapt to a new reality in which they must play a role in sustaining society at all levels (McNeely, 1984; McNeely and Miller, 1984). This theme was continued at the IVth World Congress on National Parks and Protected Areas in Caracas in 1992 (McNeely, 1993).

Prior to this, in the 1970s, the UNESCO Man and Biosphere (MAB) programme had begun to promote the creation of buffer zones around protected areas, where land use consistent with conservation was permitted. However, in practice this was not sufficiently successful in linking development to the environment (IIED, 1994b). Five years after the publication of the World Conservation Strategy, WWF initiated the 'Wildlands and Human Needs' Programme, a series of twenty practical initiatives based on protected areas, known as Integrated Conservation and Development Projects (ICDPs) (WWF, 1988; McShane, 1990). Each one attempted to directly link local benefits to protected area conservation, through social and economic development activities. Since the early 1980s there has been a proliferation of similar community-based initiatives in Africa, Asia and the Neo-tropics.

Numerous studies have reviewed the theory and practice of ICDPs and equivalent projects (Kiss, 1990; Zube and Busch, 1990; Brown and Wyckoff-Baird, 1992; Wells and Brandon, 1992; Makombe, 1993; von Loebenstein *et al.*, 1993; Wells and Brandon, 1993; IIED, 1994b). It is clear from these discussions that local 'participation' varies, and that the level of local participation is the most likely factor to determine the success or failure of an initiative. Various forms of participation exist, from passive to active. Passive forms involve the distribution of benefits from a resource without participation in decision-making processes with regard to management of the resource. Active participation or empowerment, involving local people either partially or fully in decision-making, is viewed as more desirable since it establishes more equitable partnerships by which all stakeholders exert some control over the resource (IIED, 1994b). A recent review of 23 projects concluded that, in the majority of cases, local people were treated as passive beneficiaries rather than as active collaborators (Wells and Brandon, 1992). Although some schemes, such as the well-publicised CAMPFIRE initiative in Zimbabwe (Child, B., 1996; Child, G., 1995, 1996) purport to involve local people in decision-making, very few have developed true empowerment. This is unsurprising given that the majority of protected areas are state owned and managed by

professionals who are generally opposed to relinquishing control over management and protection (Wells and Brandon, 1993; Pimbert and Pretty, 1995a; Pimbert and Pretty, 1995b).

Whilst empowerment may remain a concept rather than a reality, there are still numerous ways by which local people can gain material benefit from protected areas. Some agencies have recognised the anthropogenic nature of certain 'pristine' environments and permitted local people access to protected areas for consumptive use. Examples include Maasai grazing in Ngorongoro Conservation Area, Tanzania (Homewood and Rodgers, 1991), and grass collection in Royal Chitwan National Park, Nepal (Lehmkuhl *et al.*, 1988) and Keoladeo National Park, India (Goodwin *et al.*, 1997b). However, central to the theme of most ICDPs is the exchange of access for material considerations (Barrett and Arcese, 1995). Where human inhabitation is incompatible with conservation objectives, benefits are restricted to various forms of income generation (direct employment and associated enterprise). The most widespread means of generating local income from protected areas is through tourism (Zube and Busch, 1990; Wells, 1992; Wells and Brandon, 1993). In practice, international tourism has proved the least difficult form of use to apply to protected areas (Hales, 1989).

1.5 The History and Development of Ecotourism

1.5.1 The Growth of Tourism and Nature Tourism

The origins of tourism on a large scale stem from the industrial revolution. Steam railway development provided the first cheap, mass transport, stimulating the development of holiday resorts, particularly in coastal and scenic areas away from urban centres. International travel began to flourish in the latter half of the nineteenth century, but did not take off until the development of aeroplane technology, stimulated by the two World Wars. Post-war affluence and the advent of the consumer society, with its resultant cheap mass transport and increased leisure time, heralded the onset of modern international mass tourism (Pearce, 1981).

Over the past few decades, tourism has been one of the most consistent growth industries. In 1950, there were an estimated 25 million global international tourist arrivals. In the following 20 years the total had increased over six-fold to 166 million, and in the next two decades it had increased a further three-fold to 459 million. By 1995, an estimated 561 million international tourist arrivals were occurring annually, and international tourism receipts (excluding international transport) were estimated to exceed US\$380 billion (WTO, 1996;

Fig.1.1). In the late 1980's, tourism was ranked the third largest global export industry (Boo, 1992). It is now considered to be the world's largest industry, and arrivals are expected to exceed 1 billion by the year 2010 (WTTC, 1992; Goodwin, 1996).

Figure 1.1 Global International Tourist Arrivals, 1950 - 1995 (WTO, 1996).



The growth of tourism over recent decades has been accompanied by a geographical shift in emphasis towards less developed countries. Between 1980 and 1995, Europe and the Americas experienced a declining share of international arrivals, whilst Africa and Asia commanded progressively more of the international market. East Asia and the Pacific experienced particular growth, doubling their share of the market from 7.3% to 14.8% (WTO, 1996; Table 1.1). This trend is in part due to the adoption of tourism as an economic strategy by many developing countries, and its promotion as such by agencies such as the World Bank, the United Nations and the World Tourism Organisation. It has also been suggested that consumer demand has contributed to the expansion of tourism into less developed and more remote regions of the globe, as certain types of tourist have extended the geographic boundaries of the 'pleasure periphery' (Prosser, 1994). However, others consider a more plausible argument to be the development of transport infrastructure (Goodwin, *pers.comm.*).

Table 1.1 Trends in Regional Market Share of International Tourist Arrivals (WTO, 1996).

Region	% Share of Global Market		
	1980	1995	% Change
Europe	65.8	59.4	-6.4
Americas	21.4	19.7	-1.7
Middle East	2.1	2.0	-0.1
South Asia	0.8	0.8	0.0
East Asia/Pacific	7.3	14.8	+7.5
Africa	2.6	3.3	+0.8

Nature tourism, 'with the specific motive of enjoying wildlife or undeveloped natural areas' (WTTERC, 1993), is a growing sector of the industry. Since the 1960s there has been a great increase in nature tourism, for two main reasons. One is the increasing accessibility and promotion of huge and well-stocked national parks in Africa, which have become prime destinations for wildlife safaris. The other is the increasing number and popularity of nature and wildlife television documentaries (Ceballos-Lascurain, 1993). Nature tourism now commands a considerable segment of the international travel market. Estimates range from 10% (Giongo *et al.*, 1993), to 20-25% (Giannecchini, 1993), to 40-60% (Filion *et al.*, 1992) depending on definitions (see Jenner and Smith, 1992). Much of this sector of the industry is based upon protected areas, particularly in developing countries.

1.5.2 The Growth of a Tourism Conscience

In the early 1950s the realisation that the growth of tourism in American national parks was causing environmental problems began to surface (Nash, 1982). The response of the National Parks Service was a programme of increased development to cope with increased demand (Grosvenor, 1966; Wirth, 1966). However, a concurrent growth in biocentrism, stemming from the non-economic, ecological ethic promoted by Aldo Leopold (Leopold, 1949) heralded an alternative perspective which recognised the environmental values of protected areas. A seminal report on the state of national parks in America advocated an ecosystem approach to wilderness management and controls on the spread of tourism development within national parks (Leopold, 1963).

It was not until the 1970s that a more general disillusionment with tourism became widespread. The previous decade had witnessed the global advocacy of tourism as an economic panacea. As the industry grew, an expanding body of evidence began to highlight the negative cultural, political and environmental changes which were associated with tourism in reality (de Kadt, 1979; Mathieson and Wall, 1982; Krippendorf, 1987; Smith and Eadington, 1994). The ideological rejection of mainstream, mass tourism amongst hosts, guests and pressure groups resulted in the emergence of what has been termed 'alternative tourism' (Krippendorf, 1987; Lea, 1993; Prosser, 1994; Smith and Eadington, 1994).

Alternative tourism, together with its many synonyms, is a loose term which has been applied to anything which is perceived as alternative to mass tourism. As such it has been equated both with minority segments of a continually fragmenting market, such as adventure tourism, cultural tourism or nature tourism, and with principles of less damaging tourism. This has led to confusion and criticism since many alternative forms of tourism may be no less damaging than mainstream tourism (Krippendorf, 1987). In the 1980s, the decade of 'green consumerism', the promotion of alternative tourism became fashionable. One of its many offshoots was 'ecotourism'.

1.5.3 Towards a Definition of Ecotourism

Ecotourism, like sustainable development, is a buzzword of the '90s, and has received considerable recent attention in the literature (e.g. Boo, 1990; Boo, 1992; Lindberg and Hawkins, 1993; Cater and Lowman, 1994; Goodwin, 1996).

Ecotourism emerged at the intersection of two trends, one in conservation and the other in the travel industry (Boo, 1992). The conservation trend of the 1980s, linking conservation with economic development, demanded the extraction of local economic incentives from parks to alleviate people-park conflict (Section 1.4). The concurrent trend in tourism has been towards a greater emphasis on wilderness-based activity holidays and nature-tourism (Section 1.5 above). Where ecotourism differs from nature tourism in Boo's definition is in the explicit statement of a conservation agenda;

'Ecotourism is nature tourism that advances conservation and sustainable development efforts.'(Boo, 1992:iii).

This is one of a multitude of definitions for ecotourism that have been suggested. Indeed, there is little consensus over a definition; it continues to be an area of conflict between commercial tour operators, protected area interests and local people.

Some definitions of ecotourism characterise it purely as nature tourism. For example, the World Travel and Tourism Environment Research Centre defines ecotourism as 'tourism with the specific motive of enjoying wildlife or undeveloped natural areas' (WTTERC, 1993). More commonly recognised is a responsible aspect to ecotourism in terms of minimising negative impacts (Orams, 1995):

'travel to enjoy the world's amazing diversity of natural life and human culture without causing damage to either' (Tickell, 1994).

'Ecotourism is an enlightening nature travel experience that contributes to conservation of the ecosystem while respecting the integrity of host communities' (Scace *et al.*, 1992:14, quoted in Wight, 1994:39).

A number of others, taking their lead from the modern theme of integrated conservation and development, stipulate the requirement for economic benefits to be generated for conservation and local people:

'a form of tourism inspired primarily by the natural history of an area, including its indigenous cultures. The ecotourist visits relatively undeveloped areas in the spirit of appreciation, participation and sensitivity. The ecotourist practices a non-consumptive use of wildlife and natural resources and contributes to the visited area through labour or financial means aimed at directly benefiting the conservation of the site and the economic well-being of the local residents' (Ziffer, 1989).

'Responsible travel to natural areas which conserves the environment and improves the welfare of local people' (Lindberg and Hawkins, 1993).

'purposeful travel to natural areas to understand the culture and natural history of the environment, taking care not to alter the integrity of the ecosystem, while producing economic opportunities that make the conservation of natural resources beneficial to local people' (definition of the Ecotourism Society, quoted in Wood, 1991).

'low impact nature tourism which contributes to the maintenance of species and habitats either directly through a contribution to conservation and/or indirectly by providing revenue to the local community sufficient for local people to value, and therefore protect, their wildlife heritage as a source of income' (Goodwin, 1996:288).

None of these latter definitions are perfect. For example, many local residents in Southern Africa (and many Western recreational hunters) would take issue with Ziffer's definition for excluding consumptive wildlife tourism as a form of ecotourism. Others would question the apparent emphasis on local economic benefits whilst failing to address the socio-cultural significance of tourism in rural destinations which other forms of alternative tourism, such as Bolivian 'ethno-ecotourism', highlight. However, these semantic debates may be irrelevant in light of the way ecotourism is used in practice. In the scramble for sustainable alternatives, many proponents of ecotourism have been blinded to the realities of tourism development by the appeal of the sustainable concept (Wheeler, 1992; Wheeler, 1993; Cater, 1995). Some critics suggest that it is nothing but a marketing tool that implies sustainable practice in order to attract the discerning consumer (Wall, 1994):

'an economic process where rare and beautiful ecosystems are marketed internationally to attract tourists' (Steele, 1993).

The principle of ecotourism must equate to sustainable tourism based upon the natural environment (de Kadt, 1994). If it is to be used as a tool to fulfil the modern expectations of protected area conservation, then it must be more than a buzzword or a marketing tool. It must incorporate three major features, namely:

- **ecological sustainability,**
- **the generation of sustainable economic benefits for conservation, and**
- **the stimulation of local sustainable development in surrounding communities.**

What is currently lacking is a rational, objective evaluation of any type of tourism in the context of sustainability from the perspective of the destination area (Butler, 1994).

1.6 Summary of Key Themes

- **Tourism and conservation have been linked, through the national park idea, since its inception in the United States in the late Nineteenth Century. Protected areas have become a focus for a huge sector of the tourism industry, whilst at the same time relying on this demand for political support and economic justification.**
- **The evolution of conservation has been characterised by a conflict between preservationist and utilitarian philosophies. Tourism emerged as a mediator, a form of use which was acceptable to the preservationists and which countered the economic pressures of the utilitarians for the development of preserved land. This has occurred repeatedly throughout modern history, from early Twentieth Century America, through colonial and independent Africa and Asia, to modern global strategies for protected area conservation.**
- **In the two decades following World War Two, there was a massive expansion of travel and tourism, and American national parks became increasingly commercialised and congested. The preservationist ideals of wilderness protection were neglected in the face of consumer demand and entrepreneurial capitalisation.**
- **At the same time, tourism was being heralded as a panacea for economic development in newly-independent African and Asian countries. Wildlife tourism based upon vast protected areas was viewed by African leaders as an important source of foreign exchange, and by international conservation groups as a means to safeguard protected areas. The emergence of the visual mass media helped to promote protected areas and wildlife, and demand for nature tourism began to swell.**
- **The 1960s heralded a realisation that parks were under threat from uncontrolled tourism development. In the following decade it became apparent that mass tourism brought considerable environmental and cultural costs, whilst the economic benefits were not always as sizeable as expected. The increased awareness of the realities of tourism, and the threats which parks faced, led to the development of new principles of ecologically sound management and responsible development.**

- The 1980s heralded the emergence of sustainable development as a global concept. Conservation embraced sustainable development, and particularly the needs of previously neglected local people, as integral to protected area management. In the decade of green consumerism, industries such as tourism were obliged to reorient themselves to the goals of sustainability. The result for nature-based tourism was the 'ecotourism' concept.
- Ecotourism is the product of the parallel evolution within conservation and tourism. At its most principled, it embodies the tripartite philosophies of environmental, economic and social sustainability. It has been embraced by conservationists as a means of realising integrated conservation and development. However, it is a concept that has yet to be adequately tested or demonstrated in practice.

1.7 Aims and Overview of Study

The main aim of this study is to examine the three assumptions of ecotourism in relation to a specific case study, that of Komodo National Park (KNP), Indonesia. These assumptions are:

- tourism is not in conflict with conservation in KNP;
- tourism is of net economic benefit to KNP; and
- tourism contributes to local sustainable development in communities around KNP.

A second aim, recognising that destinations receive different types of tourist visitation, is to identify a typology of visitors to KNP, and to test the assumptions of ecotourism with respect to each type of visitor.

This thesis is divided into three parts;

- **Chapters 1-4** serve as an introduction to the topic, the study, the study site and the general methodological approach.
- **Chapters 5-9** present the data and findings of the research.
- **Chapter 10** consolidates the findings and considers recommendations for the improvement of tourism to KNP and implications for future studies.

Chapter 1 has examined the history and development of conservation and tourism, and the evolution of the concept of ecotourism as applied to protected areas. **Chapter 2** reviews the realities of tourism for conservation and local development. Firstly, the environmental impacts of tourism and their implications for protected area management are discussed. Secondly, the role of tourism in the economics of protected areas is examined, along with a number of analytical techniques and policy issues. Thirdly, the economic and socio-cultural impacts of tourism for local communities are discussed. **Chapter 3** presents an overview of tourism and conservation in Indonesia, and a detailed site profile of KNP and surrounding communities. **Chapter 4** discusses the methodological approach to the research and describes the principal methods used.

Chapter 5 analyses quantitative data regarding patterns of tourism to KNP, at a number of spatial and temporal levels. It identifies a typology of visitors with which to disaggregate the different impacts identified in subsequent chapters. **Chapter 6** examines the ecological impacts of tourism in the park, and the management initiatives which attempt to ameliorate them. An attempt is made to qualitatively and quantitatively assess the significance of the environmental impacts of tourism, and the extent to which tourism is in conflict with the conservation objectives of the park. **Chapter 7** examines park finances, and determines the level of economic benefit which tourism bestows upon the park. It also examines visitor responses to hypothetical increases in entrance fee, and other means of increasing benefits. **Chapter 8** provides an micro-economic analysis of tourism in surrounding communities. Estimates are made of employment and revenue generation. Distributional issues and leakage are also examined, along with changes in the style and pace of local development. **Chapter 9** presents the results of a questionnaire survey of local residents designed to ascertain their attitudes towards tourism and conservation. It examines perceptions of social, economic and cultural impacts, and attempts to identify factors which affect local attitudes.

Chapter 10 is a detailed discussion of the results of the study. It integrates ecological, economic and social factors into an overall picture of the performance of tourism to KNP in terms of conservation and local development. It draws out key themes and explanatory factors in the relationship and identifies particular areas of conflict. The results are related to the wider literature and to similar studies, and a series of conclusions and recommendations are tentatively presented.

2. The Impacts of Protected Area Tourism on Conservation and Local Development - A Review

2.1 Introduction

The concept of ecotourism has been defined in Chapter 1. The three assumptions of ecotourism are that it is ecologically sustainable, and contributes to both protected area conservation and sustainable local community development. Considerable research and theoretical debate has taken place regarding the performance of tourism in practice. However, much of the empirical research has been of limited scope or validity, and some areas remain conspicuously understudied.

In this chapter, some of the realities of tourism development are examined through a review of the literature regarding the impacts of tourism on protected areas and local communities. The limitations of existing theoretical and practical approaches, and gaps in current knowledge, are also highlighted. The most thoroughly researched are the ecological impacts of recreation and tourism on wildlife and protected areas (Section 2.2). This section examines visitor impacts, and management strategies designed to detect and ameliorate them. The assumption that tourism is of economic benefit to protected areas has only recently been examined in the literature (Section 2.3). A number of approaches to valuing protected areas, and their limitations, are considered. Since the 1970s numerous publications have highlighted the negative economic and socio-cultural impacts of tourism on host communities. Whilst there has been little empirical research conducted, the principal ideas and models regarding tourism development are considered in Section 2.4. The chapter concludes with a summary of key themes (Section 2.5).

2.2 The Ecological Impacts of Nature-Based Tourism

The first assumption of ecotourism is that it is ecologically sustainable and does not conflict with the conservation priorities of the area on which it is based. Tourism as a form of exploitation of protected areas is clearly identified as preferable, in ecological terms, to extractive industries such as mining and agriculture. However, from a conservation perspective, the physical impact of tourism is at best neutral and often negative, given the 'preservation of naturalness' ethic which embodies the principle of many national parks.

Numerous authors have reviewed the literature concerning the ecological impacts of tourism over the past twenty-five years (Speight, 1973; Wall and Wright, 1977; Mathieson and Wall, 1982; Edington and Edington, 1986; Knight and Gutzwiller, 1995; Roe *et al.*, 1997). From the hundreds of studies that have been conducted it is clear that, whilst much is known about specific situations, there are few simple, generalisable relationships between activity and impact. Impacts will vary depending on the characteristics of the ecosystem (including populations and individuals), and the characteristics of the disturbance (activity, behaviour, frequency, etc.) (Knight and Cole, 1995b).

2.2.1 Habitat Disturbance

Localised damage to vegetation, by trampling and vehicle tracks, is the most studied aspect of visitor impact, with a wide range of investigations in different environments (Goldsmith, 1983; Preece *et al.*, 1995). Studies have been carried out in alpine habitats (Bell and Bliss, 1973), sand dune systems (Hylgaard and Liddle, 1981; McDonnell, 1981), heath grassland (Duffey, 1975; Harrison, 1981; Bowles and Maun, 1982; Aspinall and Pye, 1987) and rainforest (Boucher *et al.*, 1991), and have identified numerous effects of trampling on these environments. These include reductions in species richness (Liddle, 1975), diversity (McDonnell, 1981), plant cover (Bell and Bliss, 1973; Hylgaard and Liddle, 1981; Cole, 1995a), primary production (Bell and Bliss, 1973; Liddle, 1975), and changes in species composition (Burden and Randerson, 1972; Liddle, 1975). Soils are also affected by trampling, including physical and chemical changes (Crawford and Liddle, 1977), soil compaction (Burden and Randerson, 1972) and litter loss (Jim, 1987). Changes in soil characteristics will adversely affect germination, establishment, growth and reproduction of plants (Cole and Landres, 1995). In addition, invertebrate fauna have been shown to be affected in trampled soils (Duffey, 1975; Bayfield, 1979).

Ecological response appears to have a curvilinear relationship with intensity of trampling (Cole, 1995a), although general trends are difficult to establish since sensitivity is a factor of both intensity of use (Hylgaard and Liddle, 1981) and environmental conditions (Aspinall and Pye, 1987), such as climatic seasonality (Harrison, 1981) and relief (Edington and Edington, 1986). The major factors affecting vulnerability to any level of trampling are vegetation type (plant structure and potential for regrowth) and environmental conditions (dry or wet soils) (Liddle, 1975). More specifically, soft leaves, year-round growth, wet habitat and easily

compacted soils have been identified as features indicating vulnerability to trampling (Kuss, 1986). A more recent study suggests that plant morphology is more important than other site factors (Cole, 1995b).

A second problem faced by many national parks is that of vehicle damage. Soil erosion and vegetation damage caused by tourist vehicles have been identified in numerous parks in Africa, including Yankari Game Reserve, Nigeria (Olokesusi, 1990), Gonarezhou National Park, Zimbabwe (Goodwin *et al.*, 1997d), and Masai Mara National Reserve (MMNR), Kenya (Kokai, 1992; Muthee, 1992). The MMNR is one of the most heavily visited in Africa, with almost 200,000 recorded visitors in 1989, over 27% of all visitors to Kenya. These visitors brought almost 24,000 vehicles into the park, for an average of 2.5 days each, leading to great concern over the potential impacts on the grassland habitat. A study revealed that increased vehicle densities and increased speed correlated with a greater loss of vegetation cover and increased soil compaction on the grasslands, that most damage occurred in the wet season, and that plant species composition changed with long term vehicle disturbance (Muthee, 1992).

The third type of habitat disturbance caused by tourism is vegetation clearing. This may be deliberate, for infrastructural development, campsite construction or bush clearing to aid visibility close to paths and roads. It may also be accidental, such as the widespread damage caused by the uncontrolled spread of fires from campsites (Roe *et al.*, 1997).

2.2.2 Wildlife Disturbance

Disturbance of wildlife can occur at a number of levels. At the level of the individual animal, disturbance can have physiological effects, cause behavioural changes, and affect survival and productivity (Gabrielson and Smith, 1995; Knight and Cole, 1995a). The physiological effects of disturbance have been little studied. The most common immediate effect to be identified is a change in heart rate (Gabrielson and Smith, 1995). However, the ultimate effects of physiological changes are unknown. At the population level, spatial distribution, growth rates and abundance can be affected (Anderson, 1995; Knight and Cole, 1995a). At the community level, changes can occur in community assemblages (species composition, diversity and abundance) and in interspecific interactions (Gutzwiller, 1995; Knight and Cole, 1995a).

The majority of studies of the direct effects of disturbance on individuals and populations has focused on changes in behaviour and survival/productivity, and most of these have been conducted on birds. Some have demonstrated the immediate effects of recreational activity upon behaviour, particularly the interruption of feeding and roosting behaviours (Hulbert, 1990; Keller, 1991; Pierce *et al.*, 1993). Others have identified the displacement of individuals away from areas of recreational activity, by showing a negative correlation between bird density and recreational intensity (Tuite *et al.*, 1984; vander Zande *et al.*, 1984; Fox *et al.*, 1994; Klein *et al.*, 1995), and the longer-term response of the displacement of nesting sites away from visitor trails (Burger and Gochfeld, 1993). Studies on individual productivity and survival, and population growth rate, have principally been confined to nesting colonies of waterbirds (Kury and Gochfeld, 1975; Anderson and Keith, 1980; Hand, 1980; Burger *et al.*, 1995). The principal effects on breeding success are nest abandonment and increased levels of predation of eggs and young (Anderson and Keith, 1980; Ahlund and Gotmark, 1989).

An increasing number of studies are being conducted on other fauna. Increased agitation/avoidance behaviour has been demonstrated in primates (Johns, 1996; Kinnaird and O'Brien, 1996) and in beluga whales (Blane and Jaakson, 1994). A number of specific activities have been shown to be disrupted by the presence of visitors, including feeding in Asian rhinoceros (Lott and McCoy, 1995), hunting in cheetah (Henry, 1980), denning in black bears (Goodrich and Berger, 1994), and reproductive behaviour in Thompson's gazelles (Edington and Edington, 1986) and Galapagos iguanas (de Groot, 1983). A reduction in breeding success due to increased egg predation has been demonstrated for nesting crocodiles in Uganda (Cott, 1969). This was a result of human disturbance during the breeding season, similar to examples for bird nesting colonies cited above. Recruitment failure could lead to population decline over a longer period. Only one study has demonstrated such an impact on population size; a 20yr study of wood turtle numbers in two populations in a Connecticut wildlife reserve identified a decline in numbers commensurate with the onset and growth of recreation in the reserve (Garber and Burger, 1995).

Effects at the level of the community have been principally demonstrated for plants (Section 2.2.1). However, indirect impacts on habitat structure can alter faunal richness, abundance and composition (Gutzwiller, 1995). Changes in food and living space will cause 'trophic cascades' in which some existing species are displaced whilst others, particularly exotics, flourish (Cole and Landres, 1995). The most common direct impact on fauna at the

community level is the disruption of predator-prey relationships. Although no studies have explored the long-term effects on community structure, short-term impacts have been identified. Disturbance which facilitates the predation of young has been discussed above for birds and crocodiles. Disturbance of predators themselves, resulting in lower hunting success, has also been discussed for cheetah. This species has also been shown to suffer increased competition for prey from lion and hyaena as a result of recreation pressure (Haysmith and Hunt, 1995). Other predators known to have been displaced by human disturbance, resulting in spatially altered predator-prey interactions, include timber wolves and bears (Knight and Cole, 1995a).

2.2.3 Pollution

Human waste, such as litter and sewage, can cause marine and terrestrial habitat damage by introducing minerals, nutrients and toxins into the environment. Wildlife health and behaviour can be affected, the latter particularly through habituation to predictable sources of food waste (Tyack, 1996). Litter can also be a fire hazard. Noise pollution can have a range of effects upon wildlife, from physiological stress and behavioural changes to reductions in productivity (Bowles, 1995). Habitat use, reproductive behaviour, parental care and social communication may all be affected by noise disturbance, although it is likely to be one of a number of principal factors contributing to visitor disturbance of wildlife.

2.2.4 Visitor Activity and Behaviour

Clearly the type of visitor activity will affect the type and intensity of impact. In addition, the timing of activities will affect the level of disturbance of wildlife. Activities occurring during the breeding or nesting seasons have been shown to be particularly important (see above), but daily behaviour patterns may also make wildlife more or less susceptible to disturbance (Tuite *et al.*, 1984). In addition, the predictability of a particular activity will affect the response of wildlife to it; learned responses depend on the outcome of the interaction and range from avoidance to habituation to attraction (Knight and Temple, 1995).

The behaviour of visitors is also an important variable (Duffus and Dearden, 1990). Both visitors and their guides can be responsible for considerable harassment of wildlife. Independent guides in Manu National Park, Peru have been reported to have excavated turtle eggs and deliberately disturbed a number of mammal species (Groom *et al.*, 1991), whilst in

Keoladeo National Park, India, local villagers disturb basking pythons in order to provide a spectacle for visitors (Goodwin *et al.*, 1997b).

2.2.5 The Limitations of Ecological Impact Research

Considerable research has been conducted in this field. The majority of work has focused on impacts on vegetation and soils (Wall and Wright, 1977), whilst wildlife impacts have received attention only relatively recently. In addition, most work has been carried out in north-temperate environments (Cole and Schreiner, 1981). However, studies are increasingly being conducted in tropical environments (Jim, 1987; Stephenson, 1990; Boucher *et al.*, 1991; Sun and Liddle, 1993), and in protected areas in developing nations. Two recent reviews (Haysmith and Hunt, 1995; Roe *et al.*, 1997) cited published research from 23 national parks and equivalent reserves in 16 countries, mostly in the tropics.

Despite this wealth of research, it has proven difficult to quantify human impacts and to assess their ultimate significance. Wall and Wright (1977) identify four confounding factors for quantitative studies:

- baseline data is often lacking
- the roles of humans and nature cannot always be disentangled
- cause and effect relationships may have spatial and temporal components which are not obvious, and
- individual components cannot be isolated in complex ecosystem interactions.

As a result, many studies are anecdotal in nature. A survey of a range of trampling studies, showed that many are superficial or anecdotal, and that no framework for monitoring and evaluating disturbance is ever provided (Goldsmith, 1983). The same is true for animal disturbance. Some 67 hours over a twelve month period were spent searching for leopards in Ruhuna NP, Sri Lanka, in which time 16 sightings were made (Chambers *et al.*, 1983). 'Alarm' was observed in 75% of sightings. Diurnal and seasonal activity patterns were inferred to have been influenced by tourist vehicle densities, but no supporting data was offered. Similarly, a study of the effect of baiting upon tigers in Royal Chitwan NP, Nepal, was based purely on anecdotal evidence (McDougal, 1980).

Most impacts are localised in nature. In addition, most studies focus on particular individuals in particular (disturbed) places, and most are conducted over short periods of time. Very few long term studies have been conducted, and as a result little knowledge exists about the significance of human impacts. Thus, displacement of wildlife may simply result in the choice of alternate, equally satisfactory nesting or feeding sites, behavioural changes may subside over time or reverse once the disturbance has ceased, and habitats may recover when visitor pressures ease. For example, as described above, numerous impacts of vehicles on the grassland habitat of MMNR have been identified. However, damaged was localised along vehicle tracks, and limited to 15.3% of the area of the reserve. In addition, recovery of vegetation in experimental plots was swift, taking around three weeks once vehicles were excluded (Onyeausi, 1986; Muthee, 1992). Short-term disturbance of wildlife may incur only temporary changes. For example, wildfowl will temporarily relocate from a disturbed area, and resume occupation once the disturbance has ceased (Tuite *et al.*, 1984), whilst mammal species have been shown to display temporary deviations from natural behaviour in the presence of human disturbance (Blane and Jaakson, 1994; Lott and McCoy, 1995). Longer-term, predictable disturbances may result in habituation of wildlife, as has been demonstrated in primates, most notably the mountain gorillas of Rwanda and Uganda (Johns, 1996).

Ultimately, there is a lack of linkage in our understanding between the proximate effects of disturbance on the individual in the short term, and the ultimate effects on populations and communities. Whilst it is difficult to quantify animal disturbance, it is even more so to show a significant impact on population dynamics. Where quantitative data has been collected (primarily for birds), it is often so specific as to be of little relevance to understanding the wider consequences for the species. Whilst conceding that the reactions of migratory and wintering waterfowl to disturbance has been well studied and documented, Madsen (1994) criticises the apparent focus on local effects. Little is known about the wider significance of localised disturbance in terms of bird distribution, reproduction and population dynamics. Part of this lack of attention and understanding can be attributed to the problem of isolating key variables (Cayford, 1993);

'So far, most studies of [bird] disturbance have been observational, with the associated problems of controlling for confounding effects and determining causal relationships' (Madsen, 1994:68).

Very few experimental studies have been carried out, since manipulating and controlling field conditions is difficult (Gutzwiller, 1991). A comparative theoretical approach, based upon an understanding of the behaviour and ecology of species in particular environments, has been advocated (Cayford, 1993). However, comprehensive baseline data encompassing the range of natural variation in a particular situation is rarely available. It was concluded that experimental manipulations may offer the best method for studying disturbance and its ultimate implications (Cayford, 1993). However, experimental manipulation may not be practical in national parks and protected areas. In light of the shortcomings of scientific research, impacts are often assessed and management policies defined on aesthetic grounds. The key for protected area managers is to integrate scientific knowledge with value judgements when considering the type of management intervention to employ.

2.2.6 Visitor Impact Management

The concept of carrying capacity as a tool for defining the upper limit of visitor use beyond which ecological damage would occur was discussed widely in the 1960s and '70s. However, in practice, carrying capacity proved very difficult to establish, principally because of the difficulty of defining maximum limits in naturally dynamic systems;

'[carrying capacity] was simply not generating technically effective and politically viable solutions to visitor management problems' (McCool, 1990).

A more recent approach has been to devise systems of management which take into account the uncertainties of a complex relationship, acknowledging both the aesthetic implications of visitor impacts, and the subjective nature of management. Perhaps the most well known of these is the Limits of Acceptable Change (LAC) system (Stankey *et al.*, 1985). However, a number of other systems exist, including Recreational Opportunity Spectrum (ROS), Visitor Impact Management (VIM) and Visitor Activity Management Process (VAMP) (Graefe *et al.*, 1990; Giongo *et al.*, 1993; Vaske *et al.*, 1995). Each of these shares four principal planning steps (Giongo *et al.*, 1993):

- Determining the current situation
- Deciding what situation is desired
- Establishing how to get from the current to the desired situation
- Monitoring and evaluating progress or success in attaining the desired situation.

In comparison with carrying capacity, the emphasis in these systems has moved from defining limits to the number of visitors, to defining the degree of change which is acceptable within the system. This refers to social as well as ecological factors, and is based on evaluating the state of the system by reference to a number of suitable indicators. Once indicator limits have been defined, direct and indirect site and visitor management strategies can be implemented. Direct tactics for limiting use include controlling overall volume of visitation, dispersing use patterns away from heavily used areas, concentrating use patterns in designated areas away from fragile areas, seasonal closures at sensitive times of year, and spatial zoning by level and form of use. Indirect tactics include visitor education and raising awareness of impacts.

However, adaptive visitor management is rarely employed. A questionnaire study of the implementation of visitor management strategies in 319 national parks around the world revealed that monitoring of biophysical impacts were only occurring in 50% of parks in developed countries, and in 35% of parks in developing countries (Giongo *et al.*, 1993). Direct management tactics were employed in less than 50% of parks overall. The conclusion reached by the authors of this study was that, in parks in developing countries,

‘an adequate level of basic infrastructure, information exchange, and training must still be reached before visitor and resource management issues become the focus of attention.’ (Giongo *et al.*, 1993:104).

2.3 The Economics of Tourism in Protected Areas

The second assumption of ecotourism is that it contributes economic benefits to protected area conservation. Protected areas have proved very difficult to justify on economic grounds in comparison to competing forms of land use. This is a result of market failure; very few of the benefits of protected areas to society (Table 2.1) can be exchanged in markets. Hence they have no financial value ascribed to them, and are either underestimated or ignored in economic analyses. At the same time, many of the costs of protected areas are more immediate and quantifiable, and hence appear sizeable in comparison to the quantifiable benefits (Dixon and Sherman, 1991). Whilst benefits are diffuse and bestowed mainly upon society in general, costs are generally acute and borne by individuals or governments.

Tourism, by providing direct financial benefits, offers a means of offsetting the opportunity costs of protected areas .

Table 2.1 Economic Benefits of protected Areas (Dixon and Sherman, 1990).

1. Recreation/tourism	
2. Watershed protection	<ul style="list-style-type: none"> • Erosion control • Local flood reduction
3. Ecological processes	<ul style="list-style-type: none"> • Regulation of stream flows • Fixing and cycling of nutrients • Soil formation • Circulation and cleansing of air and water • Global life support
4. Biodiversity	<ul style="list-style-type: none"> • Gene resources • Species protection • Ecosystem diversity • Evolutionary processes
5. Education and research	
6. Consumptive benefits	
7. Non-consumptive benefits	<ul style="list-style-type: none"> • Aesthetic • Spiritual • Cultural/historical • Existence value
8. Future values	<ul style="list-style-type: none"> • Option value • Quasi-option value

2.3.1 The Direct Benefits of Tourism for Protected Areas

Few published case studies, providing quantitative analyses of the contribution of tourism to park finances, exist. Those which do compare entrance fee and equivalent revenues with park running costs. An early report of Plitvice National Park, Yugoslavia suggested that it was self-supporting as a result of sound visitor management, good accessibility and a favourable financial arrangement with a hotel enterprise (Movcan, 1982). The Bonaire Marine Park in the Caribbean is also reported to be financially self-sustaining, with direct revenue of US\$185,000 from scuba diving fees channelled back into the park to offset annual

maintenance costs of US\$150,000, in 1991 (Dixon *et al.*, 1993). The Uluru (Ayers Rock) National Park in Australia was reported to have recouped 83% of management costs from entrance fee revenue prior to 1991 (Lindberg and Enriquez, 1994). However, in the 1991-92 financial year user revenue was reported to have equalled only 64% of management costs (Driml, 1994). In the same year, Kosciusko National Park recouped 95% of management costs through user fees, although other Australian and Tasmanian parks and reserves included in the survey recouped considerably less; total user revenue over eight protected areas amounted to A\$14.97 million, less than 25% of the A\$61 million budgetary outlay for these areas (Driml, 1994). Similarly, annual revenue from protected areas in Nepal of US\$900,000 only amounted to 18% of the US\$4.9 million expenditure on management and protection (Wells, 1993).

It is likely that most parks do not generate sufficient revenues to offset management costs, due to the low pricing structure adopted by parks, and their accessibility to the public. Those parks which do generate significant revenues charge relatively high fees of US\$5-10 or more. Only in very few cases have parks been shown to generate significant amounts above and beyond management costs, due to the uniqueness or rarity of their attractions. For example, the Galapagos National Park is reported to have recouped nine times its management costs, whilst tourism based upon gorilla viewing in Rwanda generated significant profits prior to the civil war in that country (Lindberg and Enriquez, 1994). However, both have also incurred considerable social and ecological costs as a result of their success.

However, there are problems with this approach to valuing tourism:

- **Lack of linkages between benefits and costs**

In the majority of cases, revenues from parks are returned to central government, such that there are no direct links between expenditure and revenue. The impact of tourism revenues for conservation then becomes difficult to assess. If increased revenues do not result in increased investment, then tourism may become a financial burden to parks rather than an asset (see Potts *et al.*, 1996, for a discussion of this point in relation to Hwange National Park, Zimbabwe). Conversely, even comparatively small returns from tourism may generate political support for continued or additional funding of parks (Lindberg and Enriquez, 1994).

- **Overestimating costs**

Many of the park costs against which tourism revenues are compared are not directly related to tourism. Whilst it can be argued that tourism based on a park is entirely dependent upon the continued existence of that park and should therefore support full management costs, it is also true that parks provide other benefits to society beyond recreational use. It may be an unfair analysis of the contribution of tourism to compare full park management costs with tourist revenues. Tourism must at least be expected to cover the costs incurred by its existence in a park, with further expectations dependent upon government financial policy for parks. However, disaggregating tourism-related costs from total park costs is problematic. Only one study which attempts to do so has been identified (Lindberg and Enriquez, 1994). Revenues in two reserves in Belize were compared with different estimates of the cost of tourism. At low estimates, costs were recovered with excess generated to cover traditional management costs. However, at medium and high estimates (including proportions of traditional management costs), costs were not matched by revenues.

- **Underestimating benefits**

The direct economic benefits of tourism are only a fraction of the total benefits. A recent postal survey of 319 protected areas revealed that entrance fees were only charged in 54% of areas in developing countries and 43% of developed countries, and that concession and licence fees were charged in the minority of cases (<20% for concessions, <10% for licences) (Giongo *et al.*, 1993). Pricing policy for most protected areas has promoted open access or a minimal fee structure, based on the philosophy that protected areas are merit goods which should be freely available to society (Laarman and Gregersen, 1996). With this in mind, some authors have incorporated additional benefits in economic analyses of protected area tourism.

In some cases, the considerable indirect benefits generated by tourism outside protected areas, in terms of expenditure on accommodation, transport, guide services etc. has been included (Movcan, 1982; Dixon *et al.*, 1993; Driml, 1994). However, others have criticised this approach, suggesting for marine parks at least that the existence of tourism is not dependent upon protection of the resource, and that the absence of protected area status would not necessarily eliminate the tourism industry based upon the area, at least in the short term (Pendleton, 1993).

Other authors recognise that, as a result of pricing policy, many of the benefits of tourism are non-monetary and accrue to users rather than to the funding agency. These studies have used economic estimation techniques to value the non-monetary benefits of tourism.

2.3.2 Valuing the Non-monetary Benefits of Tourism

The failure to incorporate the non-monetary, external values of environmental goods and services in land-use decision-making is viewed by some as the principal cause of biodiversity decline (Swanson, 1995). The response to this threat has been the development of environmental economics as a recognised discipline (Pearce, 1976; Pearce and Turner, 1990; Barde and Pearce, 1991; Swanson and Barbier, 1992). This attempts to include the non-monetary values of environmental goods such as protected areas in economic analyses by converting them into equivalent monetary values. Such an approach has been taken to estimate the total amenity value of protected areas.

Total amenity value is the sum of the amount paid for access to the resource (such as entrance fee) plus the consumer surplus. The consumer surplus is defined as the extra amount that consumers would pay if rights to the resource were sold by a perfectly discriminative monopolist (i.e. in a perfectly functioning market) (Shafer *et al.*, 1993). Where fees are set deliberately low or are non-existent, there will be a considerable consumer surplus. Both surrogate and constructed market valuation techniques have been used to estimate the total amenity value of protected areas to users (IIED, 1994a).

The most common surrogate market technique to be used for estimating amenity values for parks is the travel cost method (TCM) (Clawson and Knetch, 1965). This assumes that the value which users place on a site can be inferred from the amount of time and money they spend getting there. A well-known application of TCM to valuing ecotourism was that conducted for the Monteverde Cloud Forest Reserve in Costa Rica (Tobias and Mendelsohn, 1991). This study estimated a consumer surplus for domestic visitors of US\$35 per visit. Net Present Value of ecotourism was calculated to be around US\$12.5 million, resulting in a per hectare recreational value of US\$1250, considerably higher than market prices for surrounding land. TCM has also been used to value ecotourism in Madagascar, where a consumer surplus of approximately US\$300 per person was estimated (Maille and Mendelsohn, 1993), and in Kenya, where an average consumer surplus of US\$725 was estimated, of which a little over 10% was attributed to the existence of elephants (Brown and

Henry, 1989). The method has been used most extensively in the United States (e.g. Shafer *et al.*, 1993).

An alternative, constructed market valuation technique, is contingent valuation (CVM). This presents respondents with a hypothetical market situation, by asking them to reveal their willingness to pay for (or willingness to accept compensation for) a specified change in quality or quantity of an environmental product, such as a national park. CVM is the generally preferred method due to a stronger link with economic theory, and the fact that it can measure option and existence values as well as use values (e.g. valuing elephants in Thailand by Dixon and Sherman, 1990). CVM has been used to estimate the willingness to pay increased entrance fees by users of national parks in Kenya (Brown and Henry, 1989; Moran, 1994; Pearce, 1995) and the Caribbean (Dixon *et al.*, 1993). In all cases aggregate willingness-to-pay has exceeded existing revenues by a considerable amount.

However, there has been considerable debate and controversy over the use of these techniques. There are a number of methodological weaknesses and analytical constraints to both TCM and CVM (IIED, 1994a; Jakobsson and Dragun, 1996). Moreover, the utility of the results have been questioned. In most cases it is unclear how the estimated hypothetical values could be translated into tangible economic benefits for conservation. This is particularly true of TCM. However, even where CVM is based on existing payment mechanisms (such as entrance fees), the derived values do not represent *capturable* benefits. No account is taken of elasticity of demand or the effect of price increases on different users. These methods have simply been used to estimate a *single* figure designed to reflect favourably on protected areas as a land use strategy. Hypothetical benefits are a weak defence against real costs and lucrative financial alternatives. The value of CVM in identifying *capturable* benefits has yet to be fully explored or implemented.

2.3.3 Capturing Greater Benefits for Conservation

Economic valuation studies of protected area tourism have demonstrated a considerable consumer surplus. Some of this surplus could be captured by increased fees, but at present this is rarely being implemented. The most important explanatory factor may be the traditional pricing policy for parks, which has promoted open access or a token fee structure.

There is a historically and culturally ingrained philosophical perspective that natural wilderness areas which are under public ownership should be freely accessible for the benefit of society as a whole. Public support for open access can perpetuate a political unwillingness to impose fees (Laarman and Gregersen, 1996). However, it has been argued that this is a Western cultural construct and that, particularly in the developing world, pragmatic arguments in favour of increased fees outweigh philosophical objections (Child and Heath, 1990). Open access or token fees effectively result in the subsidisation of foreign visitors to parks in developing countries. They provide scant revenue for maintenance and development and little incentive for augmented government funding. They may also act as a disincentive for local people to enter the tourism industry, if pricing of accommodation within parks undercuts surrounding private initiatives. This does nothing to offset the opportunity costs of the protected area for local people (Child and Heath, 1990). However, with respect to this last point it should be noted that, if low fees result in higher visitation levels, then low fees could stimulate local development rather than depress it.

Child and Heath (1990) argue that the role of protected areas as ‘a *de facto* social amenity’ should be reviewed in light of:

- the class of people using the parks, the distribution of benefits and the overall welfare of the country;
- the effects of low charges on rural use options outside protected areas;
- the extent to which government can (and should) subsidise parks; and
- the extent to which the economic viability of protected areas might safeguard the asset.

There are numerous incentives for introducing or increasing user fees for protected areas, including revenue goals, visitor control and management, local economic stimulation and even education (Laarman and Gregersen, 1996). However, in the context of sustainable tourism, a policy based upon cost-recovery is the minimum requirement, and is also politically defensible. In practice this has rarely been implemented or achieved.

2.4 Tourism and Local Community Development

The third assumption of ecotourism is that it contributes to sustainable local community development, specifically by benefiting those who bear the greatest opportunity costs of

protected area conservation. Tourism has long been recognised as a potentially major revenue earner for protected areas and governments. It is now additionally viewed as a rural development tool with which to provide benefits to local people from conservation. Whilst very little research had been conducted into the local impacts of protected area tourism *per se* (Healy, 1994, but see Place, 1991 for an exception), there is a wealth of wider literature on the role that tourism in general has played in local development.

2.4.1 The Local Economic Impacts of Tourism

Proponents of tourism cite numerous economic benefits for host communities. The most significant, direct impacts, are revenue and employment generation. These in turn will generate knock-on effects of a second and subsequent rounds of spending, including indirect effects (purchase of goods and services by the direct recipients of tourism revenues) and induced effects (spending of wages by employees of the direct recipients of tourism revenues). In addition to these, a third benefit is the promotion of local entrepreneurial activity stemming from tourism-related infrastructural improvement (Lea, 1988).

The benefits of tourism were initially assumed to be easily achievable for developing countries and peripheral regions within them for a number of reasons (Eadington and Redman, 1991):

- tourism relies on relatively simple technologies;
- it draws on an abundant domestic labour supply;
- it would require limited capital investment;
- it can earn substantial foreign exchange;
- it can constrain industrial expansion and growing urbanisation; and
- it provides a substitute for unstable commodity exports.

Overall there is potential for local communities to gain economic benefits from tourism. However, in reality tourism may prove to be less of a panacea for economic development than once thought (Krippendorf, 1987; Lea, 1988; Ryan, 1991). The economic benefits are tempered by inflation and opportunity costs. Non-local ownership and the import of foreign goods to satisfy visitor tastes results in large amounts of leakage. Jobs in tourism may be unattractive in terms of salaries, working conditions, hours, seasonality, and the subservient connotations of the service sector. Local skills and capital are often insufficient to allow local

people to progress in the industry, and opportunities for training and promotion are limited. This often results in the development of informal trade sectors as the only means by which local people can benefit (Cukier and Wall, 1994; Evers and Mehmet, 1994; Roberts, 1995). Informal sectors are characterised by long hours for minimal returns, but they do allow entry by poor, landless and uneducated sections of the population (Wu, 1982). The development of handicraft industries is a prime example (Healy, 1994).

Some authors have expressed the view that tourism, in common with many export industries, merely perpetuates the economic inequalities between the metropolitan core and under-developed peripheral areas (Britton, 1982; Pleumaron, 1994). Economic capital, and therefore control, stem from external sources, local land and labour are sold cheaply to external entrepreneurs, the local economy becomes increasingly dependent on outsiders and tourism, with all the associated vulnerability of 'single-crop', export industries (Krippendorf, 1987). The result is an unequal distribution of benefits and costs and a loss of local control and decision making over development.

The goal of alternative tourism development, and sustainable development in general, is to combat the historic trend of increasing inequality and dependency (Brohman, 1996). However, few detailed case studies exist of either the local economic impacts of tourism (particularly distributional effects and employment generation), or the efficacy of so-called alternative developments.

2.4.2 The Social and Cultural Impacts of Tourism

The social impacts of tourism development on host communities are often neglected in favour of economic and ecological concerns (Craik, 1995). However, cultural transformation is a feature of many forms of development, including tourism. Tourists interact culturally with hosts in a number of areas, including language, tradition, gastronomy, creative arts, architecture, religion and behaviour (Ritchie and Zins, 1978). These interactions have a range of positive and negative consequences. Positive impacts include:

- increased amenity of the destination;
- maintaining community stability;
- providing new training and employment opportunities;
- fostering community pride and identity;

- supporting community traditions and enterprises; and
- broadening horizons by inter-cultural contact.

The evidence for positive social impacts is generally lacking, and negative impacts are more widely commented upon (Krippendorf, 1987; Ryan, 1991; Patterson, 1992; Craik, 1995).

Rather than improving a destination, tourism may exert undue pressure on services and facilities, and increase pollution. It may destabilise communities for a number of reasons; the strain of hospitality can become intolerable, crime accelerates, particularly prostitution, drugs and theft, and traditional residents may be displaced by the higher cost of living associated with tourism development. Employment opportunities are often limited to subservient roles, whilst training is not provided. There may also be gender inequalities in employment opportunities, leading to imbalances in traditional gender roles in the community (Cukier-Snow and Wall, 1993; Swain, 1995; Wilkinson and Pratiwi, 1995; Shackley, 1996). Cultural identity and local traditions can be severely damaged by tourism. The demonstration effects of an unfamiliar tourist culture can undermine local traditions, particularly in younger residents, resulting in cultural drift. The focus on traditional practices as a tourist spectacle can serve to debase and commodify the activity rather than preserve and enhance it (King and Stewart, 1996). Finally, tourists largely do nothing to promote cross-cultural, international understanding. Culture clash is the more likely outcome.

The level of impact, and the resulting attitude of local people towards tourism, has three determinants (Ryan, 1991):

- the level of contact between local people and tourism;
- the relative importance of the industry to the individual and the community; and
- whether or not the host community can handle the amount of tourist traffic generated.

The apparent early success of tourist development on an island off Bali may be due to the minimal contact which tourists have with local people (Long and Wall, 1996). Conversely, comparative studies in Greece (Tsartas, 1992) and Micronesia (Mansperger, 1995) suggest that increased levels of impact and scales of development lead to increased social problems. However, these are rare examples, and few studies have offered a detailed assessment of the cultural impacts of tourism within the context of sustainable development.

2.4.3 Theoretical Models of the Tourism Development Lifecycle

A number of theoretical models exploring the evolution of tourism development at a destination have been proposed. The most well known is Butler's analogy to the sigmoid curve of the evolution of visitation to a destination (Butler, 1980). Once a destination is discovered and deemed attractive, it becomes fashionable and experiences a period of growth and development. Eventually it reaches saturation, at which point negative impacts affect the appeal of the destination. It may then enter a period of stagnation and decline.

Associated with the growth of a destination is a change in the typology of visitors (Cohen, 1972; Plog, 1973). The first visitors are explorers, with lower expectations of comfort and luxury. They seek out new destinations and undeveloped areas, spending small amounts of money but relying on local facilities. This group acts as precursors for backpackers and special interest tourists, followed by general interest tourists and finally mainstream mass tourists. At each step the levels of facility and service required increase, and whilst expenditure increases it is matched by increased leakages and external involvement.

The pattern of development associated with the growth of tourism, and the change in tourist typology, is one of decreasing local control and increasing local costs (Keller, 1987). At the discovery phase, local control is maximised and benefits remain within the local community. As tourism develops it becomes *institutionalised*, assuming more of the characteristics of core-domination and peripheral dependency. Control and benefits are increasingly monopolised by external developers, and local interests become marginalised.

Local attitudes are also assumed to evolve in response to changes in tourism growth and development. One theory suggests that an initially positive attitude amongst residents towards visitors declines into ambivalence and antagonism as the expected benefits fail to materialise whilst costs and negative impacts become more apparent (Doxey, 1975). An alternative hypothesis, although similar, suggests that an initially homogenous attitude within a local community becomes more heterogeneous as the distribution of benefits becomes more unequal, favouring certain sectors of the community and not others (Dogan, 1989).

There are few test cases of these models, and validation of them is ongoing (Keller, 1987). However, the destination growth life-cycle (Butler, 1980) has been demonstrated in the Isle of Man (Cooper and Jackson, 1989). Variations in local attitudes towards tourism within host communities have also been examined (de Kadt, 1979; Dogan, 1989). Clearly there is no

single life-cycle applicable to all destinations. The path of local development will be affected by local conditions, and the progression described in these models may be halted or reversed at any point if local control can be established (Inceoglu *et al.*, 1994). As a result, the value of theoretical models as predictive tools has been questioned (Cooper and Jackson, 1989). However, they do provide a useful descriptive tool against which to judge the performance of tourism with regard to local sustainable development.

2.5 Summary of Key Themes

- Widespread research has been conducted into the ecological impacts of tourism and recreation. All aspects of the natural environment have been shown to be adversely affected by particular forms of tourism. Some generalisations have emerged, but many studies are finely focused and of little relevance to the wider debate on the significance of visitor impacts for conservation. This stems from a lack of linkages between research and management. Visitor management has evolved to deal with the conflicts which tourism presents for conservation in protected areas. Modern concepts incorporate scientific research and subjective values. However, management-oriented research and monitoring is rarely practised.
- Tourism can contribute significantly to protected area finances, but is frequently constrained by pricing policies. Economists have adopted certain valuation techniques for measuring the non-financial economic benefits of protected area tourism, in an effort to present these areas as economically viable in the absence of substantial material benefits. However, as with ecological impact research, there is a lack of linkage between academic studies and the identification of practical methods for improving the benefits of tourism for protected areas.
- Tourism development has a number of economic consequences for local communities. Whilst revenue and employment generation may be considerable, the local benefits are often reduced by leakage and distributional inequalities. Local benefits in conjunction with protected area tourism have received little attention in the case study literature. In particular, the differential levels of local impact from different types of tourist has not been examined. The socio-cultural impacts of tourism can be profound, particularly

where host cultures differ significantly from tourist cultures. Once again, this is a relatively understudied part of tourism.

- An enormous amount of research has been conducted into the ecological, economic and social impacts of tourism. However, little has changed in our fundamental knowledge and understanding of the relationship between conservation and tourism in protected areas, and development in surrounding areas. Although theory has advanced and sustainable principles have been defined, the conflicts inherent within the tourism/conservation and tourism/local development dichotomies are still predominantly unresolved in practice. There is an almost total absence of integrated studies of the ecological, economic and socio-cultural impacts of tourism, particularly in relation to protected area tourism. However, these issues are not mutually exclusive, and any strategy for sustainable development must incorporate all three. The concept of ecotourism, whilst attracting much academic debate, does not appear to have been widely scrutinised in practice.

3. A PROFILE OF KOMODO NATIONAL PARK AND SURROUNDING COMMUNITIES

3.1 Introduction

The purpose of this chapter is to provide an introduction to the study area in the context of the key themes of the research. It draws primarily on secondary sources, along with some observations made during visits to the research site.

Section 3.2 provides a national perspective by examining conservation and tourism in Indonesia. It details the history and development of Indonesian conservation and tourism, and examines the current situation with respect to protected area tourism. Section 3.3 presents a physical and biological profile of KNP, whilst Section 3.4 details the history of protective measures, both legislative and managerial, which have been applied to KNP. Section 3.5 describes the development of tourism in KNP, culminating in an overview of current tourism facilities and activities provided in KNP. Finally, Section 3.6 introduces the surrounding local communities. It approaches the question of defining 'local' people in terms of geography and ethnicity, and describes the current demographic and livelihood profiles of the communities contained within the study area.

3.2 Conservation and Tourism in Indonesia

3.2.1 Biodiversity Significance

Indonesia is one of the world's mega-diversity countries, second only to Brazil as the most important global centre for biodiversity. Although it only covers 1.3% of the terrestrial surface of the earth it contains 10% of the world's known flowering plant species, 12% of its mammal species, 16% of all herpetofauna, 17% of all bird species and 25% of the world's fish species (BAPPENAS, 1993a). It ranks seventh in the world for flowering plant richness, first for mammal richness, 3rd for reptiles, 4th for birds and 5th for amphibians. Its flora and fauna are also considerably endemic. It ranks third in the world for higher vertebrate endemism, whilst 66.7% of its flowering plants are endemic (WCMC, 1992).

The richness of the Indo-Pacific seas in Indonesia's vast amount of territorial waters result in a substantial coastal and marine diversity. The coral reef systems off Sulawesi and Maluku are among the world's richest in coral fish and other reef organisms.

Indonesia contains the largest expanse of lowland rainforest in tropical Asia, within which are the world's greatest number of palm species, and more than 400 species of dipterocarp. The plant genetic resources within the forests are enormous. However, because of forest degradation, hunting and trade, and natural catastrophes, much of Indonesia's wildlife is threatened with extinction. This problem has been heightened by the demand for Indonesian wildlife and wildlife products by overseas markets. This demand has greatly increased the prices for wildlife products.

As a result of these pressures, Indonesia has the unfortunate distinction of being the country with the greatest number of vertebrates threatened with extinction, including 126 birds, 63 mammals and 21 reptiles.

3.2.2 Protected Area Administration and Legislation

Protected areas were first established under the Dutch colonial ordinances of 1932 and 1941, and placed under the jurisdiction of the Forest Department (IUCN, 1992). The Basic Forestry Act (1967) comprehensively upgraded the legislation, defining four types of reserve: Nature Reserves, Game Reserves, Hunting Reserves and Recreation Parks (Sumardja *et al.*, 1984a).

In 1972, the Directorate of Nature Conservation (PPA) was established as part of the Directorate General of Forestry, with the responsibility for establishment and maintenance of protected areas. Soon after, a joint UNDP/FAO project was initiated to assist with the planning of protected areas. This 10-year project produced a National Conservation Plan for Indonesia, including proposals for a national network of protected areas based upon representative biogeographical coverage. It also produced a number of management plans for national parks, including Komodo (Goodwin *et al.*, 1995).

In 1983, the Directorate of Forestry was upgraded to Ministerial status and PPA became the Directorate General of Forest Protection and Nature Conservation (PHPA). At this time, responsibility for park management was devolved from national headquarters to protected

area managers themselves, although the administrative structure remains complex, involving regional offices of a number of government bureaux.

The most recent legislation regarding protected areas is the Conservation of Living Natural Resources and their Ecosystems Act (1990), which distinguishes between nature sanctuaries and nature conservation areas (including national parks). Within the latter, certain levels of utilisation are permitted according to a strict zoning system. In 1993, a National Biodiversity Action Plan was published. This identified national objectives in terms of reducing biodiversity loss, expanding information and public awareness, and fostering sustainable development (BAPPENAS, 1993a). Among specific projects identified for priority in the plan was the development of a conservation programme and protected area management in Nusa Tenggara Province, which includes KNP (BAPPENAS, 1993b).

3.2.3 Integrated Conservation and Development

By the culmination of the UNDP/FAO project in 1984, 11 million hectares were under government protection. However, the establishment of parks and the management plans drawn up for them failed to take into account human aspects of conservation, and many of the plans were unrealistic in light of available manpower and financial resources. The National Conservation Strategy was based clearly on biocentric, preservationist ideals, and made no allowances for the needs or wishes of the growing human populations surrounding national parks (Cochrane, 1994; Goodwin *et al.*, 1995).

The concept of integrated conservation and development with respect to protected areas was essentially a product of the IIIrd World Congress on National Parks, which was held in Bali in 1982 (see Chapter 1). This served as an impetus for greater people-park integration in Indonesia, although it has been slow to develop. PHPA has a management philosophy which attempts to integrate conservation with social and economic development (Robinson and Sumardja, 1990). This states that national parks should:

- contribute to the perception of the state as ecologically sensitive and responsible;
- have at least some foreign exchange benefits; and
- have relevance to local and regional development strategies.

There has been some attempt to adapt extension programmes from Indonesia's rural community development strategy (Atmosoedarjo *et al.*, 1984). However, operational initiatives have been most widely developed by NGOs and external funding agencies working in collaboration with PHPA. In 1992, WWF Indonesia began a new program titled Primary Environmental Care. This aims to conserve biodiversity and natural resources by enlisting the support, cooperation and participation of people living near protected areas (Dias, 1992). A number of specific projects have been initiated, including: community awareness and sustainable local development around Tangkoko-Dua Saudara Nature Reserve in North Sulawesi (Mustika, 1994); cultural preservation and conservation education associated with Ujung Kulon National Park, Java (Deschamps, 1992); watershed protection around Dumoga Bone National Park, Sulawesi (Sumardja *et al.*, 1984b), and; proposed ICDPs in Wasur National Park, Irian Jaya, Lore Lindu National Park, Sulawesi, and Bunaken Marine Reserve, Sulawesi (Cochrane, 1994).

The Nature Conservancy (TNC) also has a protected area programme aimed at implementing conservation with community development (Fujita, 1992). This includes work in Lore Lindu National Park and Morowali Nature Reserve, Sulawesi (Schweithelm *et al.*, 1992), and community development work around KNP focusing on sustainable marine utilisation. There are also Asian Development Bank sponsored programmes to establish integrated protected area systems in Siberut, Sumatra, and Ruteng, Flores (ADB, 1993). Many of these initiatives include a tourism component.

However, the growth of these initiatives does not imply their successful implementation. Many are still in the early development phases, and currently community participation remains a theoretical concept rather than a reality (Cochrane, 1994). None of the existing projects have been comprehensively assessed, and many rely on the promise of gains from tourism to canvass support (e.g. Cochrane, 1992; Cochrane, 1993b).

3.2.4 History of Tourism Development

International tourism to Indonesia began with the discovery of Bali in the 1920s and '30s, although its active promotion and development did not begin until the start of the Suharto government in the 1960s, when tourism was included in the first national strategy for economic development (Repelita I). Ten areas were earmarked for development, including Java and Bali, West and North Sumatra, and North and South Sulawesi. However, political uncertainties at this

time prevented Indonesia from capitalising on the global travel boom, and as such it was a relatively late starter compared with other south-east Asian nations (Goodwin *et al.*, 1995).

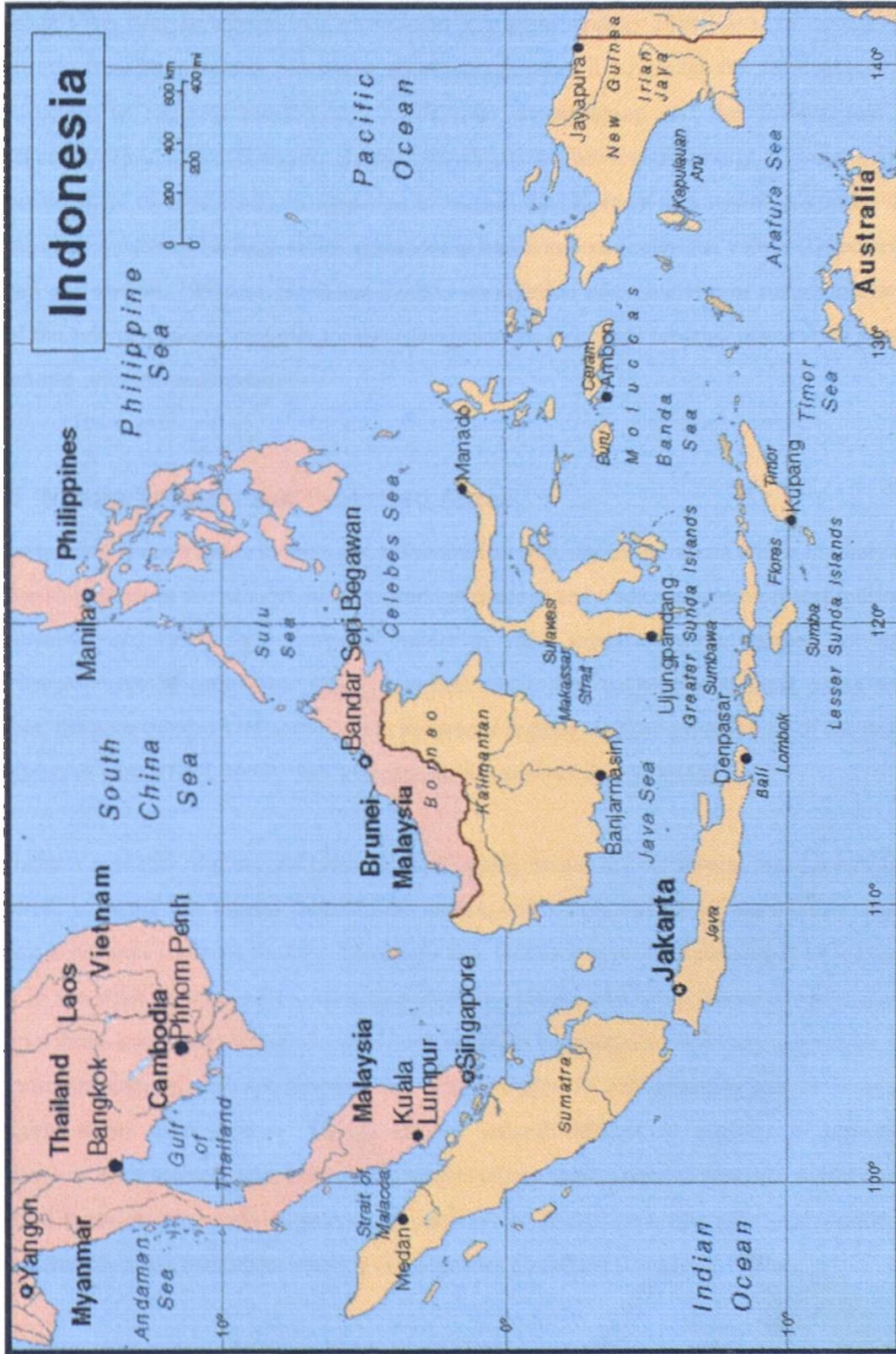
By the onset of the fourth Five-Year Development Plan in 1984, tourism was targeted as a key sector for development, and restrictions were raised on foreign entry and investment. A government awareness campaign was initiated in 1988, with the Tourist Promotion Board established a year later, and the 'Visit Indonesia Year' marketing campaign following in 1991. Tourism legislation was enacted in 1990, recognising that:

- 'the nature, flora and fauna, archaeological and historical remains, and art and culture of the Indonesian people represent an important resource for the development of tourism; and that
- tourism can play an important role in augmenting employment opportunities, regional development and national earnings through increasing the welfare and wealth of Indonesia's people, as well as encouraging love for our country, enriching the national culture and strengthening national pride, and creating friendship between nations.' (Government of Indonesia, 1990b:1).

Since 1986, annual growth rates in international arrivals have averaged 20-30% and tourism has become a major economic force. Traditional beach tourism has been augmented by cultural, nature and marine tourism initiatives. As part of this product diversification exercise, seven peripheral areas have been targeted for development, including East and West Nusa Tenggara, the islands east of Bali in which KNP is situated (EIU, 1991).

Data for tourism to the different provinces of Indonesia are lacking. However, it is clear that Bali remains the major focus for development, and acts as a hub for major tourist routes through the archipelago. The principal route is to the west of Bali, through Java and Sumatra. Travellers can also continue north from Bali through Sulawesi, or east through the Lesser Sunda islands en route for Australia. Package tours to remoter parts of the archipelago such as Kalimantan, Irian Jaya and the Moluccas also operate from Bali (Fig.3.1). However, away from the principal routes and centres, there is little by way of facilities and skills, and communication is poor. Tourism promotion has occurred before the necessary infrastructure

Figure 3.1 Map of Indonesia.



has been developed so that, currently, the market is confined to specialist tours and backpackers in these areas (EIU, 1991; Corzine, 1996).

The sixth Five Year Development Plan includes a tourism strategy aimed to ameliorate these limitations. Besides increased promotion and diversification, it advocates the development of infrastructure to improve accessibility, institutional strengthening and the development of human resources to improve skill levels and service quality. Most significantly, it recommends the development of community participation in tourism development as a means of conserving and promoting cultural heritage whilst maintaining traditional and religious values (Directorate General of Tourism, 1993a,b). However, there is no mention of ecotourism or nature tourism, nor of the role of national parks in tourism development. Indonesia remains primarily a beach and culture-oriented destination.

3.2.5 Nature Tourism and Protected Areas

Nature tourism is not a major component of the tourism industry in Indonesia and is unlikely to become so because of the strength of the cultural attractions and traditional beach-resort tourism (Goodwin *et al.*, 1995). A consultancy report in 1986 suggested three reasons for the underdevelopment of nature tourism to protected areas; the remoteness of most parks and reserves, the poor transport infrastructure in peripheral regions, and the general lack of facilities for tourists in parks (IRG, 1986). This assessment remains true over a decade later.

The tourism potential of protected areas remains largely unrealised for several reasons besides accessibility. Firstly, the rugged nature of the terrain, and the elusiveness of the wildlife make viewing it difficult for most tourists. Extremely few facilities have been developed to make it easier to see wildlife, such as guided nature trails or viewing platforms. Secondly, park staff have not been adequately trained to deal with tourists. Interpretative and language skills in particular are lacking, and management and administration is still primarily geared towards protection rather than tourism. Thirdly, it has proved difficult to develop a domestic constituency of protected area users, due to prevailing local attitudes towards wilderness. Protected areas are essentially targeting overseas visitors, and as such compete with countless more accessible areas with better viewing opportunities elsewhere (Cochrane, 1993a).

The sparse evidence that exists suggests that, currently, very few parks are realising benefits for conservation from tourism. However, tourism is viewed by PHPA as part of the long term plan

for national parks, with KNP seen as a potential model for development of other parks in the archipelago (E.Sumardja, 1994, *pers.comm.*).

3.3 Biogeography of Komodo National Park¹

3.3.1 Location

Komodo National Park is located in the Lesser Sunda Islands of Indonesia, in the province of East Nusa Tenggara (Fig.3.2). Lying in the Sape straits between Flores and Sumbawa, it comprises the three islands of Komodo, Rinca and Padar, and smaller surrounding islands, plus the straits between the main islands and all waters within 1000m of shore (Fig.3.2). The location of Komodo Island is 119°30'E, 8°35'S. The total area of KNP is 173,000ha (1,730km²), of which 35% (40,728ha) is terrestrial and 65% (132,572ha) is marine.²

3.3.2 Physical Features

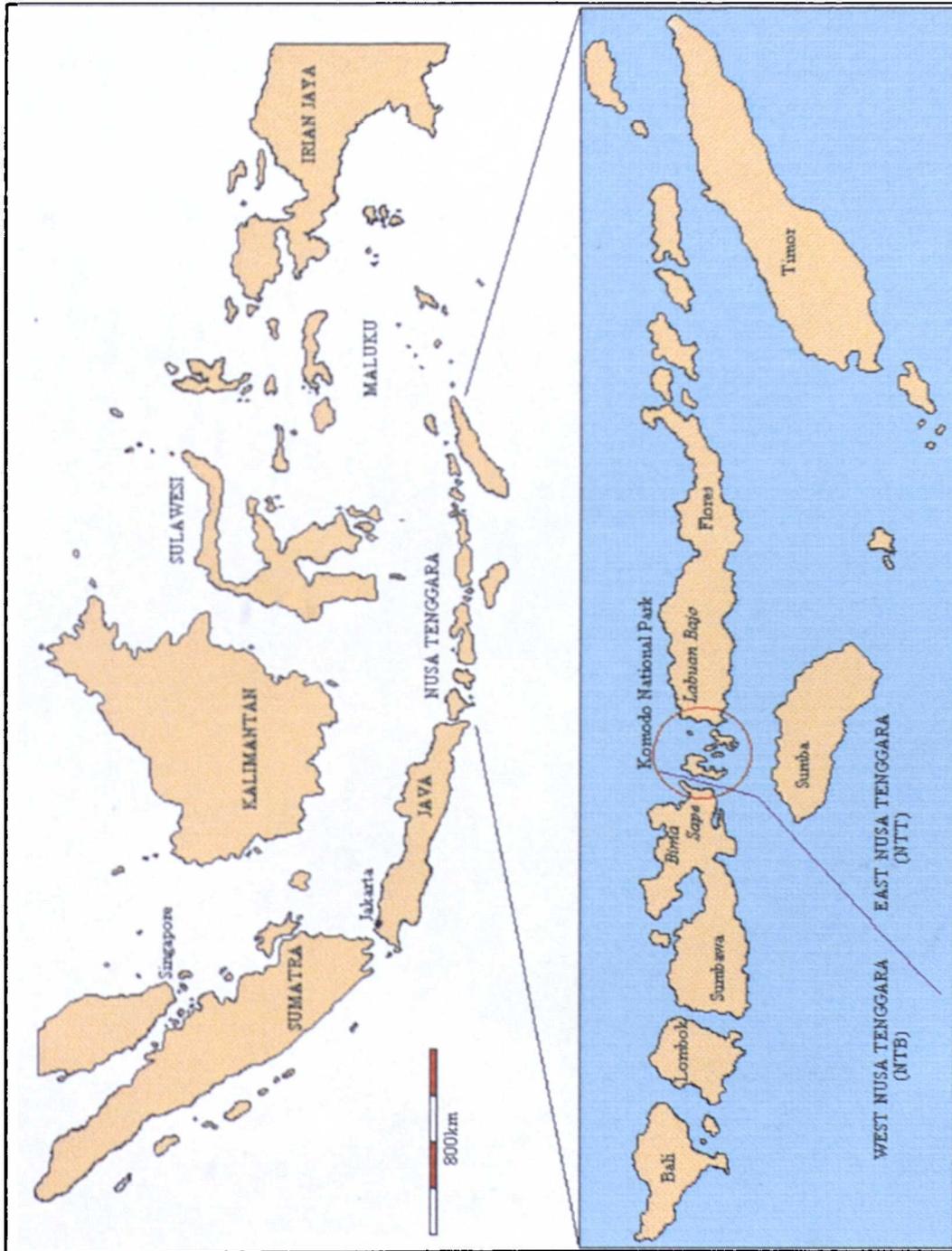
The islands are generally rugged, with sheer cliffs, numerous small bays and inlets, plentiful surrounding coral reefs and powerful offshore currents. The topography reflects the position of the national park within the active volcanic 'shatter belt' between Australia and the Sundas shelf. The islands are relatively arid with little perennial surface water, although there are fairly extensive catchment areas with good forest cover on the higher massifs of Komodo and Rinca which sustain limited water supplies throughout the year. There are a number of perennial springs around the coasts of the islands, and also streambeds where, even when dry, water may be found by digging.

Komodo, the largest island in KNP, is about 35km from north to south with a width varying from 4km at its southern end to 15km towards its northern extremity. It has a topography dominated by a range of rounded hills oriented along a north-south axis at an elevation of 500-600m. Relief is steepest toward the north-east. The coastline has many small bays and inlets separated by headlands, often with sheer cliffs falling vertically into the sea. Other bays have rocky shores or white (coral) sand beaches.

¹ compiled from unpublished WCMC and IUCN reports, and Sumardja (1981), Blower et al. (1977), Robinson and Bari (1982), and Robinson et al. (1982).

² Ministry of Agriculture Degree No.306/Kpts-II/1992.

Figure 3.2 Map Showing the Location of KNP In East Nusa Tenggara Province, Indonesia.



Rinca, further east, is the second largest island in KNP, roughly 25km in length and 12km wide at its southern end, narrowing to about 2km at the centre and then widening to some 5km towards the north. It is separated from Flores by a narrow strait. The island is mostly comprised of rolling hills, but in the south the topology is dominated by a 667m massif, while the north exhibits low, steep-sided peaks.

3.3.3 Climate

KNP lies in one of the driest regions of Indonesia with an annual rainfall of 800-1000mm. Heaviest rainfall with higher humidity and lower temperatures are recorded during the monsoon between December and March. The pattern is reversed during the dry season from May to October, when mean daily temperatures are around 40°C. There is a scarcity of water on the islands, and during the dry season streambeds near the coast often dry up.

3.3.4 Vegetation

The predominant vegetation type is open grass-woodland savanna, mainly of anthropogenic origin, which covers some 70% of KNP. The dominant savanna tree is lontar palm *Borassus flabellifer*³, which occurs individually or in scattered stands. Grass species include *Eulalia leschenaultiana*, *Setaria adhaerens*, *Chloris barbata*, *Heteropogon contortus* and, in the higher areas, *Themada* spp. Alang-alang *Imperata cylindrica* is conspicuous by its rarity.

Tropical deciduous (monsoon) forest covers about 25% of KNP. It is thorny and rather open, often secondary due to the effects of fire, and it survives mostly on the upper slopes of hills and in moist valley bottoms. Characteristic tree species include *Sterculia foedita*, *Oroxylum indicum*, *Tamarindus indica*, *Zizyphus horsfieldii*, *Schleichera oleosa*, *Cassia javanica* and others. In forested coastal valleys are also found *Murraya paniculata*, *Diospyros javanica*, *Harrisonia brownii* and *Piliostigma malabaricum*. The forest lacks the predominance of Australian-derived tree fauna found further to the east on Timor.

A quasi cloud forest occurs above 500m on pinnacles and ridges. Although covering only small areas on Komodo Island, it harbours a relict flora of many endemic species. Floristically, it is characterised by moss-covered rocks, rattan, bamboo groves and many tree

³ scientific names conform with the International Code of Botanical Nomenclature (Tokyo code, 1993) and the International Code of Zoological Nomenclature (3rd edition, 1985).

species generally absent at lower elevations. These include *Terminalia zollingeri*, *Podocarpus nerifolia*, *Uvaria rufa*, *Ficus orupacea*, *Callophyllum spectabile*, *Mischocarpus Sundasicus*, *Colona kostermansiana* and *Glycosmis pentaphylla*.

Coastal vegetation includes mangrove forest, which occurs in sheltered bays on all three major islands, such as Loh Sebita and Soro Lawi on Komodo and Loh Kima and Loh Buaya on Rinca. Dominant tree species include *Rhizophora stylosa*, *R. mangle* and *Bruguiera* spp., with *Avicennia marina* frequently bounding the landward side in large stands. Pioneering beach vegetation includes *Ipomoea pescaprae*, *Spinifex littoreus* and *Cassytha filiformis*. Extensive sea grass beds occur to the north end of Rinca Island.

3.3.5 Fauna

KNP is best known for the Komodo monitor, *Varanus komodoensis*, known locally as 'ora' (Figs.3.3-3.4). Discovered in 1910, its total population was estimated in 1972 to be c.5700 individuals with a very limited distribution, although more recent surveys within KNP suggest that it is unlikely that more than 3000 exist in the wild (Table 3.1). It is found only on the islands of Komodo, Rinca, and Gili Motong and in certain coastal regions of western and northern Flores. The species is probably extinct on Padar, where it was last seen in 1975. It is the world's largest living lizard, with males often weighing over 90kg and exceeding 3m in length.

Very little is known about Komodo dragons in the wild. The most comprehensive field study of the species was carried out between 1969 and 1972 (Auffenberg, 1981). Auffenberg noted that 'in some areas our information is still sparse: physiology, demography and reproduction data are scanty,' (Auffenberg, 1981), and this remains true 25 years after his original fieldwork. The following is a brief resume of some of Auffenberg's findings.

Komodo dragons exhibit both predatory and scavenging behaviour. The principal prey species of adult dragons on Komodo island are deer and wild boar. However, carrion constitutes a significant portion of their diet, and individuals may follow olfactory signals to a carcass over distances of several kilometres. Congregations of individuals at carrion sites is common, but usually limited to less than four individuals at any one time. Congregations may last 1-2 days until the carcass is consumed. Intraspecific aggression has been noted at feeding sites, and a defined social hierarchy exists with the larger, dominant individuals

Figure 3.3 Komodo Dragon, *Varanus komodoensis*.

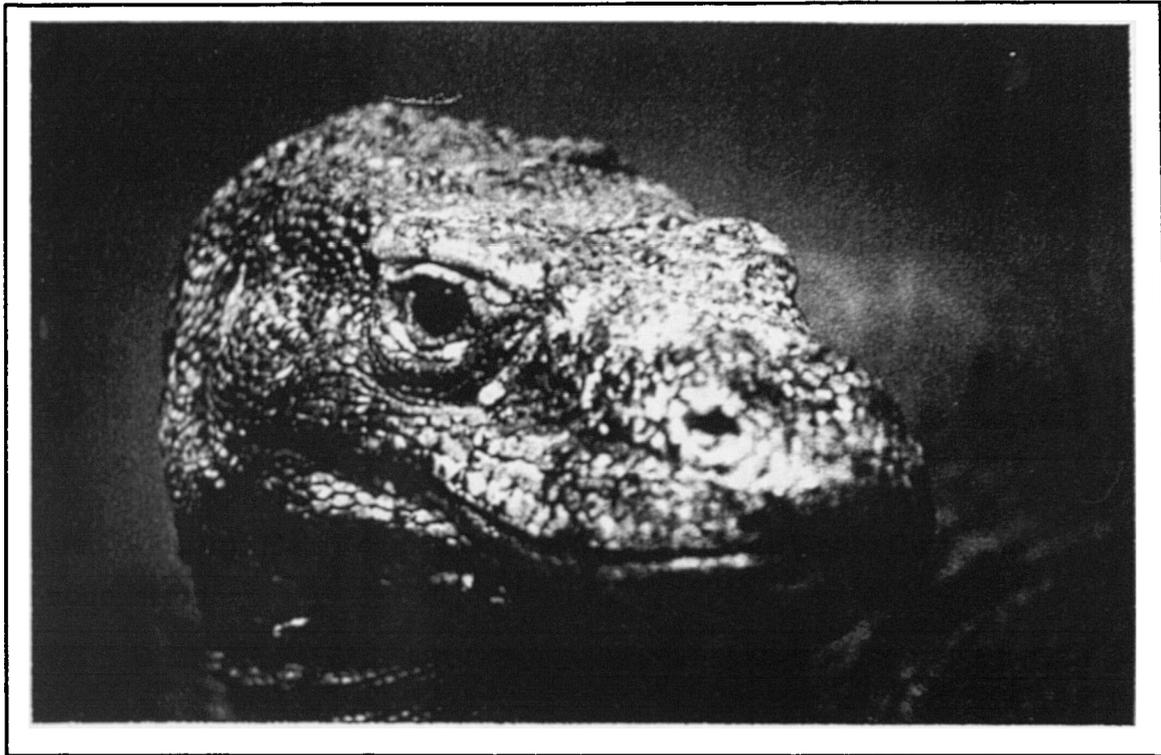
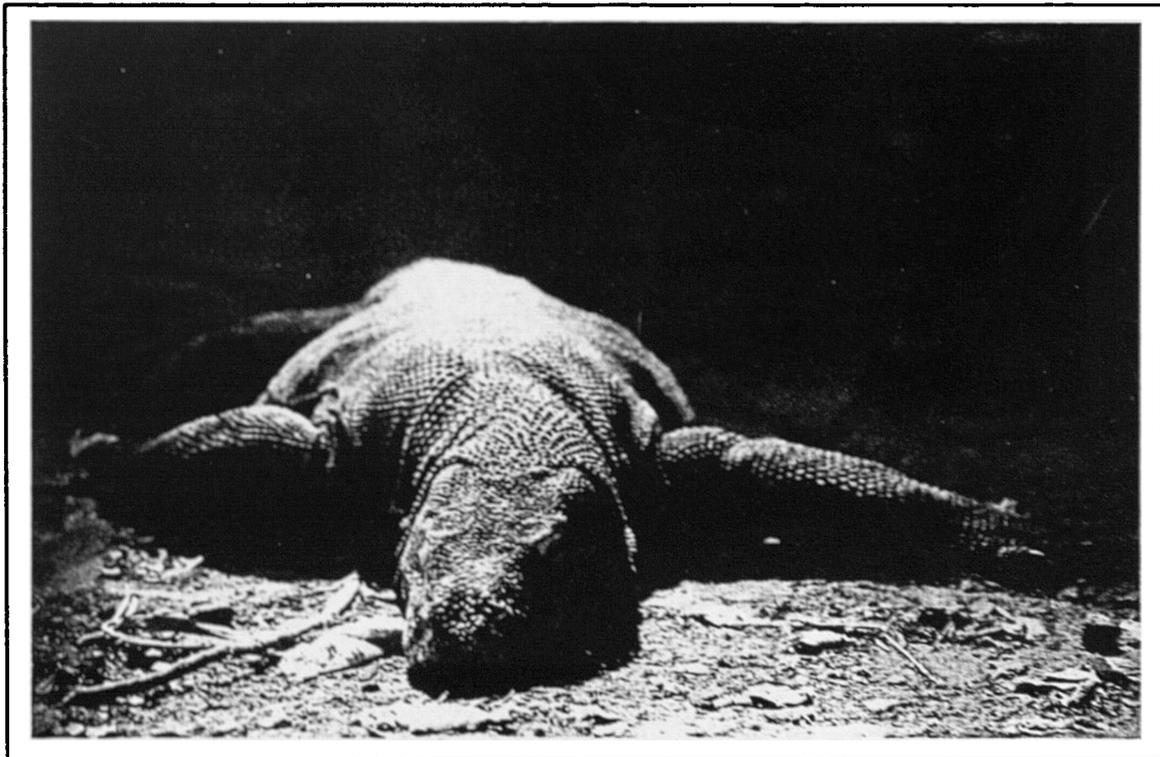


Figure 3.4 A Large Male Komodo Dragon Residing in the Visitor Camp on Komodo island.



commanding greater access to the carcass. Juvenile individuals are rarely given the opportunity to feed on carrion.

Table 3.1 Dragon Population Estimates, 1959 - 1995.

Year	Komodo Island	Rinca Island	Total in KNP	Total Population	Survey Method	Source
1959	400-500	100	1000-1500	1500-2000	unsubstantiated estimate	Auffenberg, 1981
1960	1500	-	2500	n/a	unsubstantiated estimate	Auffenberg, 1981
1972	2348	792	3265	5713	Mark recapture	Auffenberg, 1981.
1993	1574	1050	2624	n/a	Baiting	TNK, 1994a; TNK, 1994b.
1994	1639	1110	2749	n/a	Baiting	TNK, 1995
1995	1687	-	-	n/a	Baiting	TNK, 1996

Ranging behaviour can be similarly divided into foraging ranges and scavenging ranges, the latter incorporating the former and extending over a larger area and determined by wind direction and topography. Komodo dragons do not exhibit territoriality, although the core home ranges of resident individuals rarely overlap. Scavenging ranges overlap considerably, particularly with respect to carrion sites. Very few individuals are resident in an area for long. Most are transient migrants which wander over large areas, spending a few weeks to several months in a locality.

There is a small seasonal pattern to activity levels of foraging individuals, with more having been observed in the wet season months (January and February) than at other times of year, although at feeding sites there was no seasonal pattern in observations. However, reproductive behaviour has a marked seasonal dimension. Successful copulation in captive dragons is confined to a three month period (July - October), whilst observations in the wild suggest a narrower breeding period, confined to June and July. Courtship and mating appear to commonly take place at carrion sites in the presence of small groups (1-4 individuals) of other individuals. This is unusual, and the vague territoriality, aggression and social hierarchy associated with carrion may interfere with courtship or confine successful mating to dominant individuals.

Population estimates for Komodo dragons (Table 3.1) are highly questionable. No systematic monitoring was undertaken until 1993. However, this annually repeated survey has relied on extrapolating observed counts of dragons at a number of temporary bait sites on Komodo and Rinca Islands (Chapter 6). Dragons are assumed to be attracted to bait from within a 500m radius, with total counts multiplied by the ratio of the total area of the island to the total assumed 'area of influence' of the bait sites. This method assumes an equal distribution of dragons across each island, without taking into account habitat preferences and topology. It is likely that actual population sizes are considerably lower than current estimates.

Several other species of herpetofauna inhabit the different vegetation zones, including frogs, reptiles and snakes such as the green pit viper *Trimeresurus albolabris* and the common cobra *Naja naja*. The mammal fauna is characteristic of the Wallacean zoogeographic zone, with seven terrestrial species recorded including the endemic rat *Rattus rinjanus* and the crab-eating macaque *Macaca fascicularis*. Other mammal species include rusa deer *Cervus timorensis* and wild boar *Sus scrofa*, as well as feral domestic animals including horses and water buffalo. 72 species of bird have been recorded, including the sulphur-crested cockatoo *Cacatua sulphurea*, the noisy friarbird *Philemon buceroides* and the common scrubhen *Megapodius freycinet*.

3.3.6 Marine Environment

As a result of a continual interchange of water between the Flores Sea and the Savu Sea, the waters around KNP have a high degree of oxygenation and nutrient richness, which together with intense sunlight has produced a rich coral reef system fringing the islands. Dominant corals on most reefs are *Acropora* spp., as well as *Millepora* spp. and *Porites* spp.. *Fungia* spp. are present on reef slopes. In areas of strong currents, the reef substrate consists of an avalanche of coral fragments, with only encrusting or low branching species, such as *Seriatophora caliendrum* and *Stylophora pistillata*, being able to withstand the rapid water flow. More protected reef slopes are dominated by species of the genera *Heteropsammia* and *Heterocyathus*. Reefs off the north-east of Komodo have a particularly high species diversity.

There is an abundance of plankton in the waters surrounding the islands, which lie close to the migratory routes of a number of marine mammals. These include the blue whale *Balaenoptera musculus* and sperm whale *Physeter catodon* which are occasionally observed.

In addition to numerous varieties of sharks, 10 species of dolphin have been recorded as well as the dugong *Dugong dugon*, although the latter is probably rare.

3.4 Conservation in KNP

3.4.1 History of Protective Legislation

The history of protection of the area goes back to 1938 when Padar and part of Rinca were established as nature reserves, although it did not receive national park status until 1980 (Table 3.2).

Table 3.2 History of Protective Legislation of KNP.

Year	Legislative Measures
1938	Padar Island and part of Rinca Island established as a Nature Reserve.
1965	Komodo Island gazetted by Ministerial Decree No.66.
1977	Komodo Island (excluding village) accepted as a 30,000ha Biosphere Reserve under the UNESCO Man and Biosphere Program.
1980	KNP established by a letter of the Minister of Agriculture. 75,000ha, comprising Komodo, Rinca, Padar and Gili Motong Islands, and surrounding waters.
1984	KNP extended to 219,322ha (Ministerial Decree 46/kpts/VI-sek/1984) to include expanded marine buffer zone and parts of western Flores
1990	Nomination by Indonesian Government for World Heritage status
1992	KNP included on UNESCO World Heritage list
1992	KNP amended to 173,000ha (Ministerial Decree 306/kpts-II/1992) by removal of Flores reserves.

In 1978, Komodo Nature Reserve was administered under the Regional Centre for Nature Conservation VII (BKSDA VII) in Kupang, the capital of Nusa Tenggara province. The management of nature reserves was the responsibility of the Directorate of Nature Conservation (PPA), the national headquarters of which was based in Bogor. In 1984, PPA was replaced by the Directorate General of Forest Protection and Nature Conservation (PHPA), part of the Ministry of Forestry. Responsibility for management of KNP passed directly to the park director in Labuan Bajo.

KNP exists primarily as a protected area for the conservation and protection of the Komodo monitor in its natural habitat. Even before the first establishment of reserves on the islands this species was declared protected by the Sultan of Bima, and killing of it prohibited. This was extended to a prohibition of capture and possession of live or dead Komodo monitors or parts thereof, and also to the collection of eggs and disturbance of nests.

In 1992 KNP became a World Heritage Site. The application for inclusion of KNP on the World Heritage list cited four criteria pertaining to the natural properties of KNP (Table 3.3). An IUCN evaluation recommended inclusion on the list based upon criteria III (superlative natural features) and IV (habitat of threatened species).

Table 3.3 Criteria for Inclusion of KNP on World Heritage List

<p>Earth's evolutionary history - Komodo lies at the junction of the Australian and Asian tectonic plates and has experienced a violent geological history.</p> <p>Biological Evolution and man's interaction with his natural environment</p> <p style="padding-left: 40px;">The Komodo monitor and the isolated environment in which it has evolved represent an outstanding example of biological evolution.</p> <p style="padding-left: 40px;">Prehistoric archaeological remains, in particular large 'menhirs' (megalithic statues), are found in KNP, but their significance is not yet fully understood.</p> <p>Superlative natural features - KNP's landscape is regarded as among the most dramatic in Indonesia, with the rugged hillsides of dry savanna and pockets of thorny green vegetation contrasting starkly with the brilliant white sandy beaches and blue waters surging over coral.</p> <p>Habitat of threatened species - KNP is the only place in the world where the Komodo exists in the wild. Being an island group and relatively isolated, it is one of the best locations in which to ensure the long-term survival of the species.</p>
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3.4.2 Conservation Values of KNP

- **Biodiversity Values**

The terrestrial species richness of KNP is moderate. Plant species richness is relatively low, with some 102 different species recorded, whilst bird and mammal species number 72 and 7 respectively. This is because KNP consists of small islands, lacking the extensive rainforest of the larger islands of the archipelago. However, the remnants of moist forest from earlier eras are interesting and diverse. The marine environment is very species rich owing to the presence of a substantial fringing coral reef system. It is considered one of the most species-rich areas of reef in Indonesia, and one of the richest areas in the world for fish, containing almost 1000 species (Holthus, 1995). What KNP lacks in terrestrial species richness it makes up for in special characteristics; it includes some of the least-disturbed remaining dry lowland forest of the Lesser Sundas, and contains a limited yet characteristic Wallacean transition fauna.

The rationale for the inclusion of KNP on the UNESCO World Heritage list was as a habitat for threatened species. The Komodo dragon is listed by the IUCN as vulnerable, and is endemic to KNP and the western tip of Flores. Other endemic species include *Rattus rintjanus*, and listed species include the sulphur-crested cockatoo (endangered), the blue whale (endangered) and the dugong (vulnerable) (IUCN, 1996).

- **Socio-Economic Values**

The major economic value of KNP for surrounding communities relates to its considerable marine resources. Fishing is the mainstay of the local economy in both the subdistrict of Sape, to the west of KNP on Sumbawa, and the subdistrict of Komodo, which includes KNP and the adjacent part of western Flores to the east. Local people are allowed to fish within the waters of KNP, but it is clear that overexploitation is occurring, with many boats from outside the local area operating in KNP, and a number of destructive fishing practices being used (see below). Both pelagic and sedentary marine resources are utilised, and whilst the local community relies more on the former, the non-local fishermen primarily exploit the latter (Pet and Djohani, 1996). The villagers of Kampung Komodo collect squid and fish for drying and salting, which takes place on the island. They also carry out an activity called *meting*, which involves the collection of marine products (sea cucumber, shells, pearls, fish) from specific

coastal sites around the island. Shrimp is also harvested for the production of *terasi* (Sudibyo, 1995a). There is a commercial pearl farm situated on Rinca island.

Terrestrial resources include wildlife (principally the Timor deer, *Cervus timorensis*, and water buffalo, *Bubalus bubalis*) and forest products (tamarind, firewood, building wood and bamboo, mangrove wood for squid drying boards). These have been utilised both by villagers within KNP and outsiders. Some cultivation has occurred on land around villages within KNP. The Komodo dragons do not appear to have been hunted, probably for cultural reasons. There is a local creation myth which suggests that the Ata Modo people and the dragons are siblings.

- **Aesthetic and Amenity Values**

These values are based on the conservation values of KNP (the dragons, the characteristic Wallacean biodiversity, and the marine diversity), and also on the landscape and the opportunities to undertake recreational activities in KNP. Since the designation of KNP in 1980 tourism has emerged as a means of exploiting the aesthetic and amenity values of KNP. The collection of entry fees has allowed KNP to capitalise on these values.

- **Current Prioritisation of Values**

The current designation of the area as a national park prioritises conservation and non-consumptive utilisation in core areas. According to Act No.5 of 1990, 'Concerning the Conservation of Living Resources and their Ecosystems' (Government of Indonesia, 1990a), a National Park is 'a nature conservation area which possesses native ecosystems, and which is managed through a zoning system which facilitates research, science, education, breeding enhancement, recreation and tourism purposes' (Chapter I, Article 1).

Much of the terrestrial area of KNP is Core Zone, within which any form of utilisation is prohibited. Tourism facilities may be developed in the Utilisation Zone of national parks. Much of the marine part of KNP is a Buffer Zone in which consumptive utilisation is permitted. Whilst utilisation of living resources and their ecosystems is permitted outside of the Core Zone, it 'shall take place with strict maintenance of the conservation function of the area' (Chapter VI, Article 27).

The socio-economic values of KNP for local communities, in terms of terrestrial usufruct rights, have been curtailed. The original management plan (Blower *et al.*, 1977)

recommended the relocation of some village communities outside KNP, and the restriction of the remaining communities to enclaves within the protected area. Only three communities currently remain within KNP, with restricted rights to terrestrial resource utilisation.

The original management plan for KNP (Blower *et al.*, 1977) refers to five priorities for management; conservation, research, tourism, education and interpretation, and estate management. Current management priorities include much clearer reference to the need for integrated conservation and development, with much closer links between KNP and surrounding local communities (Djuwantoko, 1996; Subijanto, 1996). It is clear that tourism is viewed as having a major role in both conservation and local development. The suggestion has been raised by current managers that KNP should apply to become a self-funding body, using tourism as a means of revenue to support protection and management.

3.4.3 Park Management

KNP headquarters is in Labuan Bajo. In addition there are ten ranger posts on the islands within KNP, including those at the two visitor centres of Loh Liang (Komodo island) and Loh Buaya (Rinca island). In total, 90 staff are employed by KNP. The director is supported by 5 structural and technical advisors and an administration staff of 19. There are 11 information officers (community extension workers) and 54 rangers who patrol KNP and guide tourists. Rangers work for 21 days in the field, followed by 7 days leave.

KNP is funded entirely from government sources, the total budget comprising three separate operating budgets. The Routine budget is for wages, equipment, maintenance and transport. Two capital budgets are provided for additional project expenses. The APBN⁴ budget is for development, particularly of new infrastructure, and patrolling. The IHH budget, from the Ministry of Forestry, is for operational activities concerning forest protection and utilisation. Both involve some degree of community extension work. Any overspend is compensated for by central government, and any surplus funding returns to central government.

The main objective of the establishment of KNP was to ensure the survival in perpetuity of the Komodo monitor. A management plan was written under the UNDP/FAO programme in 1977, inventorying the flora, fauna and history of the area. The plan was revised in 1982 (Robinson *et al.*, 1982). The principal recommendations of the plan were: the establishment

⁴ APBN and IHH are Bahasa Indonesia acronyms.

of a national park with marine zone; the resettlement of smaller human settlements outside KNP and the inclusion of larger ones as enclaves; the development of tourism infrastructure and management (including zonation of KNP by intensity of permitted use); conservation by habitat management (including controlled burning) for both Komodo monitor and their prey, and; the control of feral dog as a perceived threat to the Komodo monitor. Between the 1977 plan and the 1982 revision the authors noted improvements in the administration, supervision and productivity of staff, with more frequent patrols and better results in terms of arrests of poachers. By 1982 staff were resident on Komodo and on Rinca.

The main failing of the plan, aside from overambitious development goals, was the deliberate exclusion of local people from any form of involvement in KNP. Although it was envisaged that local people may benefit from tourism to KNP, tourism development was deliberately located away from village enclaves which reduced local exposure to tourism. At the same time, no efforts were made to assist local people to become more involved with tourism.

In 1996, a new management plan was completed, which gave greater emphasis to community participation and development (Djuwantoko, 1996). Community participation and utilisation are two of the four main goals of current management, the other two being environmental management and protection (Subijanto, 1996). Tourism is ascribed a major role in implementing these goals.

3.5 Tourism in KNP

3.5.1 History of Tourism to KNP

Tourism to the islands of KNP has existed since the discovery of the Komodo monitor, and this charismatic species is the prime focus of the attention of visitors.

Wild animals, and carnivores in particular, are difficult to observe in the wild except at points of natural congregation such as waterholes or feeding sites. The provision of bait to attract carnivores to a location for scientific or recreational observation is widely practised. On Komodo Island, baited traps were used as a means to capture dragons for export to zoological gardens, and have also been used to enable researchers to take body measurements and tissue samples. Provisioning with dead goats has been used to attract dragons to the vicinity of a hide in order to facilitate behavioural observation by ecologists (Auffenberg, 1981). More

recently, it has been used as a means of attracting dragons to a location where they can be viewed by tourists.

The earliest visitors to Komodo baited the monitors with a goat (dead or alive) staked out in an appropriate place. In the early 1980s a feeding site for the dragons was established about 2 kilometres easy walk from the accommodation centre and jetty. The use of provisioning as an aid to tourist viewing has been carried out at a much greater intensity than that for scientific studies. Whereas field studies have to date been short term, baiting for tourists has taken place regularly weekly or twice weekly for over ten years, with several goats provided on each occasion, purchased from the local village. The monitor gradually became habituated to humans and to receiving offerings of dead goat, which became increasingly frequent as visitor numbers expanded. KNP management eventually decided that provisioning was unhealthy for the dragons, and in conflict with the objective of providing a natural viewing experience. Provisioning ceased in August 1994.

3.5.2 Visitor Access to KNP

All visitors to Komodo National Park arrive by boat. There are three means of transport to Komodo Island: the local government-run ferry that travels between Sape and Labuan Bajo; a chartered boat (Fig.3.5), either a round trip from Sape or Labuan Bajo or a chartered passage between Lombok and Labuan Bajo, or; a cruise ship from further afield (Fig.3.6), usually from Bali. Independent tourists have access to the ferry or can charter boats (mainly from Lombok or Labuan Bajo), whilst package tourists either arrive in cruise ships or in local boats chartered by the tour company (mainly from Sape). It is only possible to reach Rinca Island by charter boat. The different routes of each type of transport are shown in Fig.3.7.

3.5.3 Visitor Facilities Within KNP

The Third World Congress on National Parks provided the impetus for PHPA to upgrade facilities in some of the parks nearest Bali to which field trips were arranged for delegates, including Komodo. Visitor facilities in KNP are concentrated at Loh Liang on Komodo Island and Loh Buaya on Rinca Island (Fig.3.12).

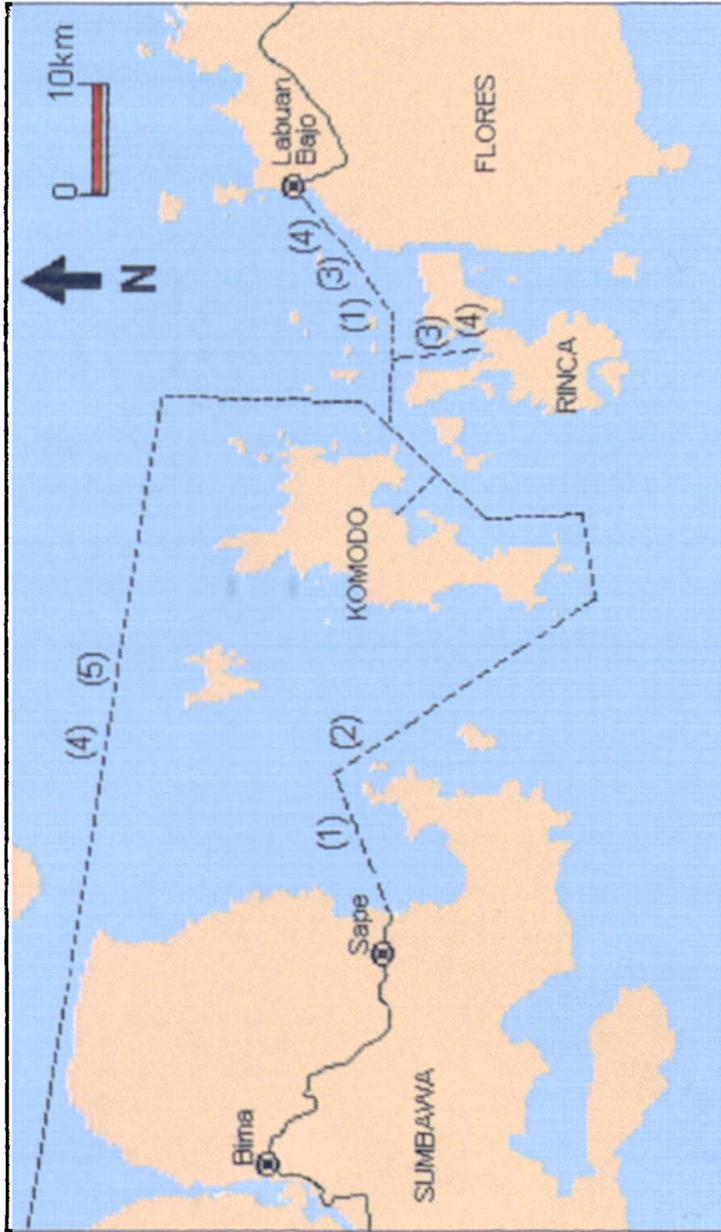
Figure 3.5 A local Charter Boat Used by Visitors to KNP.



Figure 3.6 The Bali Sea Dancer, a 160-passenger Cruise Ship Which Visits KNP Twice-Weekly From Bali.



Figure 3.7 Map Showing Routes of Visitor Transport to KNP.



- | |
|--|
| <ul style="list-style-type: none"> (1) Ferry (2) Charter Boat to/from Sape (3) Charter Boat to/from Labuan Bajo (4) Charter Boat to/from Lombok (5) Cruise Ship |
|--|

Loh Liang is a large circular bay on the east side of Komodo. The visitor facilities, rangers quarters and park office are situated in a camp 2 kilometres north of Kampung Komodo, the only village on the island. Access to the camp at Loh Liang is by boat, and visitors disembark onto a wooden jetty which is a short walk from the camp. Larger vessels must anchor in the bay and ferry their passengers to the jetty in inflatables or other small vessels. Loh Liang currently incorporates the following facilities for visitors:

- **Main office:** where visitors pay their admission fee and complete the visitor book (Fig.3.8).
- **Interpretation centre:** a new building housing biological exhibits from the island and information boards detailing the history of the islands (Fig.3.9).
- **Information boards:** situated outside the main office, these boards provide information and advice for visitors, together with an orientation map.
- **Rest room:** newly constructed for day visitors.
- **Sheltered platforms:** open-sided and with thatched roofs, two resting platforms are situated on the edge of the beach allowing visitors to rest and picnic with a view across the bay.
- **Cafeteria:** a large, open-sided building seating 40-50 people, the cafeteria sells drinks, simple meals and a selection of other supplies and provisions, as well as souvenirs and postcards.
- **Accommodation:** overnight accommodation is available in six lodges, although at present one of these is under renovation, and another is under construction. These lodges are divided into several rooms and house approximately 50 visitors. They include toilet and ablution facilities.

A limited network of trails is available for guided walks by visitors outside of the camp (Fig.3.12). Most activity is concentrated along a 4km circular trail to a viewing site and back. The facilities provided along this trail are;

- **Orientation signs,** outlining the route for visitors at the trail head.
- **Footbridges,** constructed over small gullies to provide an easier and safer walk.
- **Resting platform.** An open-sided shelter situated beside the trail 1.1kms from Loh Liang, with a litter bin.
- **Viewing enclosure.** A fenced enclosure overlooking a dry river bed, with a shelter and interpretation board (Figs.3.10-3.11).

Figure 3.8 The Main Office on Komodo Island Where Visitors Register.



Figure 3.9 The Visitor Interpretation Building on Komodo Island.



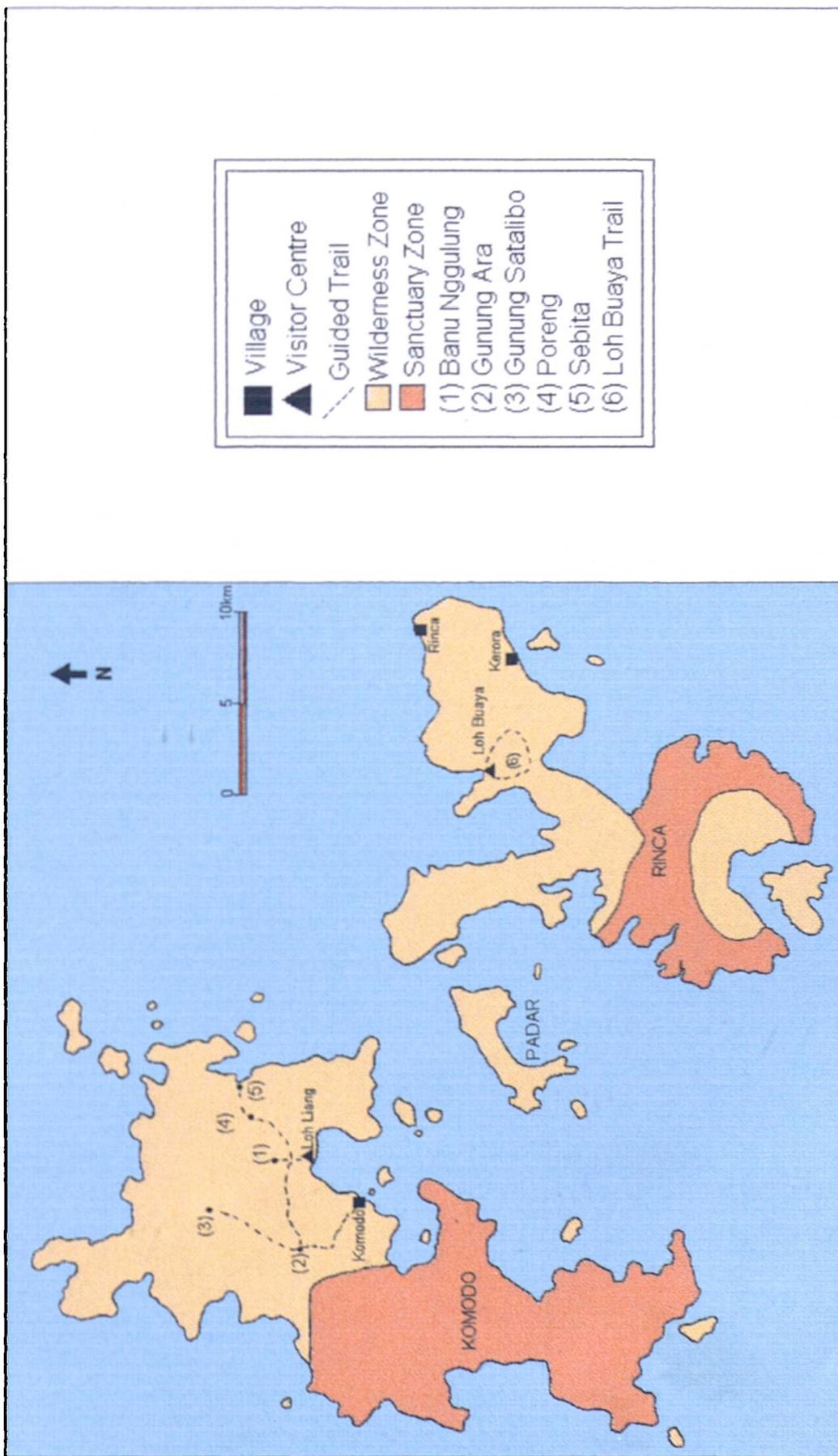
Figure 3.10 The Visitor Enclosure at Banu Nggulung From Where Visitors View the Dragons.



Figure 3.11 A Typical Visitor Encounter with a Dragon at Banu Nggulung.



Figure 3.12 Map of KNP Showing Villages, Visitor Centres and Trails.



Facilities on Rinca are concentrated at Loh Buaya. This is a scaled down version of Loh Liang. Only two overnight lodges exist, and the cafeteria only serves drinks and snacks. There are no designated viewing sites for visitors to see Komodo dragons, although a network of hiking trails provides scenic views across the island as well as the opportunity to see a variety of wildlife.

3.5.4 Visitor Activities Within KNP

Current visitor activities on Komodo Island outside the area of the camp at Loh Liang are limited to guided walks along designated paths. The primary objective for most visitors is to view the Komodo dragon (Fig.3.11), although the path network offers the opportunity for birdwatching and other gameviewing. The path network itself is limited to the following destinations, from Loh Liang (Fig.3.12):

- **Banu Nggulung:** previously the baiting site for the Komodo dragon, a 4km circular route through gallery forest.
- **Gunung Ara:** the second highest peak at 530m, offering breathtaking views over the islands of KNP and beyond. 13km there and back, including steep climbs on exposed ridges.
- **Gunung Satalibo:** the highest mountain, an extension of the Gunung Ara path, usually involving an overnight stop.
- **Poreng:** a disused feeding site several kilometres north of the visitor camp.
- **Loh Sebita:** a bay north of Loh Liang.

However, the network of paths other than to the old feeding site at Banu Nggulung are infrequently used (Chapter 5). It is also possible to visit Kampung Komodo, the only local settlement on the Island, by following the beach at low tide.

Aside from guided walks, it is possible for visitors to Loh Liang to snorkel or scuba dive over coral. This activity occurs at Red Beach (Fig.5.1) and involves a short boat ride from Loh Liang. No facilities were provided for snorkelling until August 1996, when snorkelling equipment and boat hire became available from the Koperasi at Loh Liang.

From Loh Buaya on Rinca there exists a circular trail over moderate terrain, passing through monsoon forest and savanna grassland and including scenic views across the island. A series of short cuts and extensions permits a range of distances up to 7kms to be chosen.

3.5.5 Revenues from Tourism

The only source of revenue from tourism which accrues to KNP is the compulsory entrance fee. Tourist spending on optional services within KNP (accommodation, guiding, cafeteria and shop purchases) are handled by the Koperasi (see below and Table 3.4). The entrance fee permits a stay of up to a week in KNP, although most visitors stay only a few hours. In January 1993 the price of entrance rose from Rp1000 to Rp2000 (approximately US\$0.87).

Table 3.4 Source and Initial Destination of Tourism-related Revenues in Komodo National Park.

Source of Tourist Expenditure in Park	Cost/person (Rp)	Initial Destination of Tourist Expenditure in Park ⁵
Entrance fee	2,000	KNP
Accommodation fees	10-20,000	Koperasi
Purchases (cafeteria and shop)	n/a	Koperasi
Guiding fees (Banu Nggulung/Loh Buaya)	1,000/1,500	Rp3,000/4,500 to guide, rest to Koperasi
Guiding Fees (other)	10-35,000	75% to Guide, 25% to Koperasi

All revenue from visitor entrance fees to KNP returns to regional and national government according to the following allocations;

- District Authorities 40%
- Provincial Authorities 30%
- Central Government 15%
- PHPA head office 15%

At present, all other tourism-related revenue is handled by the Komodo Koperasi. The Koperasi is a co-operative organisation that provides visitor services in Loh Liang and Loh Buaya, and in Labuan Bajo. It was founded in 1987 to provide restaurant facilities in these locations. In 1994 it also assumed control of the visitor accommodation facilities within KNP.

⁵ All revenue to KNP is subsequently divided between local and central government (see above).

At this time, expenditure and revenue associated with visitor accommodation passed to the Koperasi from KNP.

The Koperasi is overseen by a steering committee of twelve senior KNP staff, chaired by the park director. It employs a manager and 18 ground staff; 10 in Loh Liang, 2 in Loh Buaya and 6 in Labuan Bajo. All 90 park staff are members of the Koperasi, and all pay in an annual deposit, made up of compulsory and voluntary contributions. Annual dividends are paid to all members based upon the size of their deposit.

The Koperasi retains the revenue from overnight accommodation in KNP, and cafeteria profits. It also retains a proportion of the guiding revenue. Until May 1995, the individual guide received 75% of the fee paid by tourists (Rp3000 per group for the Banu Nggulung trail, Rp5-10,000 for longer trails), whilst the Koperasi received the other 25%. Since May 1995, each visitor to Banu Nggulung has paid Rp1000 (minimum Rp3000 per group). Of this fee, the guide receives a fixed amount of Rp3000 (US\$1.30) and the Koperasi retains the rest. For longer walks the 75:25 split between guides and Koperasi remains.

Koperasi profits are divided in the following way;

• Retained as capital	40%
• Members dividends	40%
• Steering committee incentives	5%
• Employee incentives	5%
• Education/Training	5%
• Development work	2.5%
• Social Fund	2.5%

Although senior KNP staff still control the Koperasi via the steering committee, it is financially independent of central government, and is essentially a privatised commercial tourism development within KNP.

3.6 Local Communities and KNP

Before attempting to assess the benefit to local people of tourism to KNP, it is necessary to define who these people are. This is not always a simple task, but it is important. There are many different scales of 'local' and many different groups of 'local people' with potential interests in KNP. Clearly geographic factors are important, with those people living within or in close proximity to KNP defined as 'local'. However, history also plays a role, with certain ethnic groups claiming more established roots in an area whilst other, more recent inhabitants may be considered less local. The communities surrounding KNP have a diverse cultural mix, and defining local and non-local based on ethnicity is likely to be problematic.

Returning to the theory of integrated conservation and development to which ecotourism aspires, local people are defined as those individuals who are most disadvantaged by the existence of a protected area, whether by the opportunity costs of denied access and utilisation of resources, or by suffering direct costs such as crop damage or injury by wildlife. For the purposes of this project, local people were defined as those living within or adjacent to KNP and who currently rely, or traditionally relied, upon resources within KNP. This conforms with the distinction made by Sudibyo (Sudibyo, 1995a; Sudibyo, 1995b) during recent socio-economic surveys in and around KNP. In practice, attention was focused on communities rather than individuals, and distributional differences between 'local' and 'non-local' sectors within each community examined (Chapter 8 & 9).

KNP lies on the border of two provinces; East Nusa Tenggara (NTT) and West Nusa Tenggara (NTB) (Fig3.2)). There are a number of settlements within KNP itself. There are also rural communities in bordering districts on both sides of KNP which utilise the marine resources of the park (Sudibyo, 1995b).

There is a diverse cultural and ethnic mix in the community in and around KNP. Not all groups can be considered indigenous, but many have become firmly integrated into the community. Whether they should be considered as local people when assessing the current division of benefits from tourism is difficult to answer. An attempt is made, in Chapter 8, to identify the origin of those benefiting from tourism in order to better assess the local contribution which tourism makes.

3.6.1 Communities Living Within KNP

Communities within KNP comprise the villages of Kampung Komodo on Komodo Island, and Kampung Rinca and Kerora on Rinca Island (Fig.3.3). These villages were not relocated out of KNP upon its establishment, but were allowed to remain as enclaves on the islands, with utilisation rights over marine areas in KNP but no rights other than access over terrestrial areas outside of the enclaves. These people, arguably the most local of the locals, have suffered direct opportunity costs as a result of the ban on hunting, clearing and felling, and some restrictions on marine utilisation.

The early history of the Komodo islanders is uncertain. Initially the islands may have been temporary stopovers for traders and fishermen, and travellers during storms (Bagus, 1986). It has also been suggested that Komodo was used as an exile or penal colony by the Sultan of Bima, under whose jurisdiction the islands fell from 1727 until 1930 (Hitchcock, 1993). However, research in the early 1980s showed that both the language and social organisation of the Komodo people was sufficiently different from those of Sumbawa for the islanders to be considered a separate ethnic group, the Ata Modo, which may have originated on Western Flores some 2000 years ago (Verheijen, 1982).

Due to immigration and intermarriage, there are very few of these original inhabitants remaining. One report suggests 18.4% of the population within KNP is Ata Modo (Bagus, 1986), whilst another reports that the last pure-blooded Ata Modo person died in the mid-1970s (Ellis, 1996). There has been continual settlement by other ethnic groups recorded in island legends (Needham, 1986). Nowadays the majority of inhabitants are of Bajo and Bugis origin, along with some Bimanese and Manggarai people (Hitchcock, 1993; Sudiby, 1995a). Many of these immigrants were granted land rights on the islands.

The early settlements on Komodo were small due to their isolated nature, the poor quality soils and the scarcity of fresh water. It has also been suggested that slave trading in the nineteenth century had an impact on the population (Zollinger, 1956).

The population of Kampung Komodo has grown substantially since the 1977 management plan was written. At that time there were 529 people in 79 families, whilst in 1994 the population had almost doubled to 1024 people in 267 families. Kampung Rinca has also grown substantially, from 460 people in 1977 to 636 in 1994. Kampung Kerora is a more recent settlement, originating in 1955 (Sudiby, 1995a). It has a population of 214 people

living there (Table 3.5). The rapid growth rates in these villages is a symptom of a high birth rate and high immigration, exacerbated by the cultural practice that men from other areas who marry women from the islands are expected to move to the islands.

The high growth rate of the island communities is seen by some as a threat to KNP's resources. There have been attempts to move them to Flores, giving them more land in compensation. These moves have been made partly on the basis that the islanders are incomers from neighbouring islands so have no traditional roots in the area - although this is not the case for at least a part of the population. Suggestions that they move have been strongly resisted by the Komodo islanders, and so far the PHPA and local government have been unwilling to press the point.

The Ata Modo were small-scale farmers, well adapted to the poor soils, supplementing crops with the collection of forest products. Nowadays there is still some cultivation, collection of woodland products such as tamarind, bamboo and honey, and animal husbandry, particularly in Kampung Kerora (Sudiby, 1995a). The local staple is sago extracted from the *gebang* palm, although rice has become more important with more frequent contacts with the market centres of Bima and Labuan Bajo. Hunting of deer and boar continues, although the monitor do not appear to have been hunted, probably for cultural reasons (Blower *et al.*, 1977; Hitchcock, 1993).

The most important economic activity is fishing, which employs the majority of the male population of the islands. Squid is the principal catch, along with other commercially valuable fish and shrimp. All are dried and processed on the islands before export to market. Another important form of marine utilisation is the practice of *meting*, the periodic collection of intertidal marine products such as shells and sea cucumbers (Sudiby, 1995a). These activities, particularly the squid fishing, are seasonal.

3.6.2 Communities Living Adjacent to KNP

Besides the inhabitants of KNP, communities surrounding KNP also depend on its resources. To the west, on Sumbawa, is the subdistrict of Sape in Bima Regency. There are seven settlements bordering KNP, including the subdistrict centre, Sape. To the east, on Flores and adjacent islands, is the subdistrict of Komodo, Manggarai regency. There are seven settlements bordering KNP in this subdistrict, including the centre, Labuan Bajo.

The inhabitants of Sape subdistrict are Bimanese, whilst those inhabiting Komodo subdistrict are Manggarai people. The major immigrant groups in these areas are Bugis and Bajau from south Sulawesi. The latter were originally nomadic, and only recently began settling coastal parts of Sulawesi, Nusa Tenggara and Maluku. In the towns of Sape and Labuan Bajo there are people with a variety of tribal and geographic origins. Bajo, Bugis and Manggarai are interspersed with West Javan, Sumatran and even Chinese (Sudibyo, 1995b).

The seven communities to the west of KNP, in Sape subdistrict, have a total population of approximately 29,000, of which approximately 4,300 are located in Sape town. The seven communities to the east of KNP, in Komodo subdistrict, have a total population of approximately 13,500, of which approximately 4,400 are located in Labuan Bajo town (Table 5.1, and Sudibyo, 1995b). As with the communities within KNP, there has been considerable population growth. The population in Komodo subdistrict has increased by 50% in the ten years from 1983 (Sudibyo, 1995b). Much of this is due to immigration; fishermen from other islands are drawn to the area because of the rich waters of KNP, and immigrant traders and entrepreneurs have been attracted by the development of Labuan Bajo and Sape as regional market centres.

Table 3.5 Local Populations in and Around KNP (from Sudibyo, 1995a).

Local Area	Number of Settlements	Approximate Total Population	Approximate Population in tourist/resident contact points ⁶
Within KNP	3	1807	914
Sape Subdistrict	7	29,000	4,326
Komodo Subdistrict	7	13,559	4,398
Total	17	44,366	9,638

The coastal villages adjacent to KNP are principally seafaring communities who have fished for generations in the waters between these two islands. Their market economy is based on marine products, particularly squid and milkfish. Fishermen are principally of Bajo origin, with some

⁶ *Kampung Komodo, Sape and Labuan Bajo respectively (Section 3.6.3).*

Bugis also involved. A small proportion of the Flores communities are farmers, and these are principally of Manggarai origin. One traditional Bimanese village in Sape subdistrict is also based predominantly on farming. Civil servants and traders are mostly Bimanese, Javanese and from Lombok (Table 3.5, Sudibyo, 1995b).

Whilst farming is principally small-scale and self financed, fishing is a capital-intensive industry. The majority of local fishermen do not own their equipment, but either work for a small number of boat owners or borrow credit from lenders. This stifles local development since borrowers must sell their catch to their creditors for a fixed, low price rather than at open market (Bagus, 1986; Sudibyo, 1996b). The number of local and non-local boats operating in the waters of KNP has increased considerably over recent years as demand for squid has grown, and technology has improved to increase yields. However, most fishermen perceive catches to be declining as a result of overfishing, and question the long-term future of the industry (Sudibyo, 1995b).

3.6.3 Links Between Local People, KNP and Tourism

KNP lies on one of the established routes taken by backpacker tourists travelling through the Lesser Sundas. During the last 5 years Indonesia has become fashionable among backpackers and numbers have increased dramatically, with a consequent increase in low-budget accommodation in Sape and Labuan Bajo.

The towns of Sape and Labuan Bajo act as gateway ports for visitors to KNP, and hence infrastructural development has been concentrated in these places. It is in these places that the direct financial benefits of KNP tourism are most likely to be felt. Within KNP, tourism development was deliberately located away from villages. Only Kampung Komodo receives any visitors or any benefit from tourism.

The islanders of both Komodo and Rinca have been allowed to remain as enclaves within KNP, but with reduced rights to resource utilisation, particularly of terrestrial resources. The communities living adjacent to KNP also continue to use marine resources, but must compete with outsiders. Until recent initiatives were promoted by TNC, none of the communities within or adjacent to KNP were consulted about their perceptions or aspirations with regard to the park. It has been externally imposed upon them and externally managed.

3.7 Summary of Key Themes

- **KNP is a small National Park in eastern Indonesia, which is designated as a MAB biosphere Reserve and a UNESCO World Heritage Site. It consists of a number of small islands and surrounding waters. Its terrestrial biodiversity is moderate, although it does display a characteristic Wallacean transition fauna. Its major conservation value is as the majority of the range of the vulnerable Komodo dragon (*Varanus komodoensis*). KNP management and protection are funded by national government.**
- **The Komodo dragon is also the major tourist attraction of KNP. Visitors travel by various forms of sea transport from neighbouring islands and further afield to view the dragons. The principal visitor activity is a short walk to a viewing site on Komodo Island which was, until 1994, the site of artificial provisioning of dragons with goats. Other, longer guided trails are also available to visitors on Komodo and Rinca Islands, the two larger islands of KNP. Tourism is viewed as an integral part of KNP management and a valuable source of revenue.**
- **There are local communities living within and adjacent to KNP. Traditional livelihoods have been, and continue to be, based upon pelagic fishing within the waters of KNP. Terrestrial usufruct rights of KNP residents have been curtailed since the designation of the area as a National Park in 1980, and current marine fishing practices are unsustainable. Tourism is being promoted as a means to offset the opportunity costs of KNP for local people, and to increase the benefits which local people gain from KNP.**

4. General Methodologies

4.1 Introduction

This study assesses the ecological, economic and social impacts of tourism based on KNP. It was conducted as part of a wider project carried out in collaboration with host partners in three countries; India, Indonesia and Zimbabwe. This is the first time a study has attempted to comprehensively assess the performance of 'ecotourism' by simultaneously examining impacts from three different perspectives; ecological, economic and social. It is also the first time that individual protected areas have been the focus of such interdisciplinary studies of tourism.

This chapter introduces the methodology for the study. Section 4.2 describes the wider research project of which this study forms a part. Section 4.3 explains the rationale for the methodological approach taken, whilst Section 4.4 provides an overview of specific methods which were employed. Section 4.5 documents the framework of field research undertaken. The major points of the chapter are summarised in Section 4.6. It should be noted that further detailed presentation regarding specific methods is presented in the relevant data chapters (Chapters 5-9).

4.2 DICE/ODA Tourism, Conservation and Sustainable Development Project

In 1994, the Overseas Development Administration (ODA) of the British Government funded a three year study by the Durrell Institute for Conservation and Ecology (DICE) entitled *Tourism, Conservation and Sustainable Development*. This was a comparative study of protected area tourism in three developing countries; India, Indonesia and Zimbabwe. The specific study sites within each country were, respectively, Keoladeo National Park, Komodo National Park, and the south-east lowveld region.

The project was designed to identify and quantify the nature of the relationships between tourists, the tourism industry, local communities and national parks. It also aimed to identify ways of maximising benefits from tourism for parks and local communities, whilst

minimising the negative ecological implications of tourism (Goodwin *et al.*, 1997a). A particularly important feature of the ODA project was the focus on collaborative research with host partners. The project aimed to develop a methodology for continued use in each site by host partners, and for comparative research in other developing countries.

The research reported in this thesis is an extension of one of the case studies included in the ODA project (Goodwin *et al.*, 1997c). A team of four DICE staff and students collaborated on research design in the early stages of the ODA project (see acknowledgements). This author then assumed responsibility for undertaking specific methodological design, field research, data analysis and reporting of the KNP case study in order to fulfil the objectives of the ODA project, which broadly equate to those of this thesis outlined in Chapter 1. This author also assisted with the other case studies and the comparative analysis for the ODA project, which are reported elsewhere (Goodwin *et al.*, 1997a,b,d).

The methods employed in this study are those developed as part of the ODA project. The overall methodological approach and the use of particular techniques reflects the objectives of the ODA project with regard to the type of data collected, the collaboration with local counterparts, time and cost-effectiveness, and the need for replicability in this and other similar sites elsewhere.

4.3 Rationale for a Rapid, Integrated Approach to Data Collection

The broad range of issues under examination necessitated an integrated approach to the research. Both natural and social science methodologies have been implemented, drawing on both quantitative and qualitative data. As such the study conforms to Robson's definition of 'case study':

'a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence' (Robson, 1993:52).

An integrated approach, utilising a combination of both quantitative and qualitative methods, is preferable to a narrower, single method inquiry, since it combines quantitative precision with qualitative detail (Warwick, 1983). In addition, the specific problems and limitations

associated with operational research in developing countries demand a more holistic approach to data collection (Bulmer and Warwick, 1983). Central to the idea of case studies is the concept of *triangulation*. This is a process whereby more than one source of information is used to examine a particular issue, with the intention of increasing both the range and quantity of data pertaining to the issue, and confidence in the accuracy of results and conclusions. Triangulation has been used across all areas of this study.

One of the principal objectives of the ODA project was the development of applicable research methods for use by local researchers to provide data which would be of practical use to planners and managers and which could be collected in a rapid and cost-effective manner. To this end, rapid methods of data collection and short-term survey techniques were employed. This approach is ideal for certain aspects of the study such as economic appraisal, particularly where existing data sources can be tapped. However, for aspects such as ecological and social change it has been contested. Both ecological and ethnographic research is usually characterised by long periods in the field undertaking large amounts of quantitative or qualitative data respectively. However, in the context of 'real world research' (Robson, 1993), traditional methods of inquiry may not be appropriate:

'Decisionmakers need information that is relevant, timely, accurate and usable. In rural development, a great deal of the information that is generated is, in various combinations, irrelevant, late, wrong, or unusable anyway. It is also often costly to obtain, process, analyse, and digest it remains a remarkably inefficient activity. Criteria of cost-effectiveness have not been applied, and manifest inefficiency is sometimes met by demanding not better information, or less, but simply more.'
(Chambers, 1981:95).

Chambers (1981) criticises both 'quick and dirty' and 'long and dirty' approaches to research, the former typified by short term development consultancies and the latter by traditional academic inquiry. An alternative approach, using multiple methods to obtain appropriate data in optimal amounts, utilising local expertise and adapting to local situations, is advocated (Chambers, 1981). This study has attempted to conform to this approach.

4.4 Overview of Methods Employed

Extended periods of ecological or ethnographic research were impractical within the scope of this project, and were rejected on principle. Hence small to medium scale quantitative questionnaire surveys were used as the primary method of new data collection, combined with the collection and analysis of appropriate secondary data. Observation and qualitative appraisal, and local discussion of results, were used to validate and contextualise the quantitative data. This section describes the broad methods employed in the study, whilst detail regarding specific methods of data collection are included in the relevant chapters.

4.4.1 Documentary Evidence and Data Archives

Data has been collected from a number of sources. Most extensive were KNP records, including compiled statistics from the park headquarters and raw data entry books from the visitor centres within the park. Information on visitation patterns, expenditure, revenue and ecological impacts has been collected from these sources (Chapters 5, 6, 7 & 8). Other sources include hotel visitor arrival books, police report forms and harbour office records. These have all been used to collect information on visitor patterns in gateway towns (Chapter 8). Business accounts have been accessed in rare cases to assist in assessing local economic contributions (Chapter 8).

Existing reports on ecological and socio-economic conditions, providing a mixture of quantitative and qualitative data, have been used where relevant to contextualise primary data (Chapters 3, 6 & 8).

The use of existing data, accounts and reports is common practice in applied research. Sources may provide considerable quantitative data, often amassed over a long period of time. They may also provide valuable contextual data. However, there are a number of limitations inherent in this source (Shipman, 1981). Firstly, the researcher has no control over how the data was collected, since information regarding methodology is often unrecorded. Secondly, where sources are not original, copy errors or reporter biases can affect the accuracy of the records. Thirdly, the credibility of reporting can be questioned where the original reporter may benefit from false or inaccurate reporting.

These limitations underscore the importance of corroborating documentary evidence through triangulation. All of the above criticisms could be aimed at different sources used in this study. Therefore triangulation has been used wherever possible to validate results.

4.4.2 Questionnaire Surveys

Questionnaire surveys of tourists have been used to investigate willingness to pay increased entrance fees to KNP, preferences regarding tourism development of KNP (Chapter 7), and contributions to the local economy (Chapter 8). These were carried out both within KNP and in Labuan Bajo, the major gateway town to KNP. Questionnaire surveys of local people have also been used to examine employment and revenue generation (Chapter 8), and perceptions and attitudes towards tourism and conservation (Chapter 9). These were conducted in both gateway towns and the village of Kampung Komodo on Komodo Island.

Many authors prefer an anthropological approach to sociological and development research (Ellen, 1984; Eyles and Smith, 1988); the common criticism of rapid, quantitative survey methodologies being that they lack sufficient insight (Chambers, 1983). However, they do allow greater sample sizes to be collected in a shorter period of time, and have been used in numerous studies of people-park interactions (Newmark *et al.*, 1993; Hartup, 1994; Mkanda and Munthali, 1994; Nepal and Weber, 1995; Studsrod and Wegge, 1995), and of local perceptions of tourism (Ap *et al.*, 1991; Wall, 1996).

The major criticism of questionnaire surveys has been mentioned above. A well-structured survey based on a representative sampling frame will yield a reliable quantitative data set but will lack qualitative insight (Shipman, 1981). It has also been criticised for assuming an underlying social norm that can be approached through the collective responses of individuals, and for the application of the concept of causality to human actions and beliefs (May, 1993). However, in the absence of random allocation of individuals into different experimental classes, questionnaires cannot actually prove causality. They can only demonstrate correlation between variables. In addition, the analysis of correlations can be used to highlight differences in the underlying population rather than to measure a central tendency within the population. The investigation of correlations and variation are considered to be legitimate goals of questionnaires, and are the basis for the surveys undertaken in this study.

However, questionnaires can still be criticised on hermeneutic grounds (May, 1993). Can questions formulated out of the cultural context within which they are to be applied yield valid responses? Will respondents interpret questions in the way that researchers intend? Can a limited set of variables adequately incorporate and isolate the multitude of social actions and responses to a given situation? And, how do respondents' statements of attitude and intent relate to actual actions? The debate surrounding quantitative versus qualitative social research methods continues. Questionnaires, in common with almost all applied methods, are not a perfect methodological instrument, but with careful design they do provide a useful tool. It is reiterated that combining methodological approaches will strengthen any research, and where possible questionnaire surveys have been used in conjunction with other complementary techniques.

4.4.3 Semi-Structured Interviews

Less standardised interviews were conducted with a number of key informants as part of the investigation of visitor impacts and management (Chapter 6). These followed a basic structure of discussion topics, but allowed for elaboration and additional probing by the researcher.

Semi-structured interviews of this nature combine a certain level of standardisation, in that all respondents are asked the same basic questions, with the facility to explore beyond the confines of the structure and attain a greater level of insight into particular issues. The method is a compromise between a fully-structured, quantitative approach and an unstructured, qualitative approach (May, 1993).

Interviews of this nature, unlike questionnaire surveys, could only be conducted by the author, so that the content of the discussion was gained firsthand and not distorted through intermediate interviewers. This limited the respondents to those who could speak English, primarily park staff. Time constraints also precluded extensive surveying of this nature. Whilst it would have been a useful tool to augment the survey of local attitudes and perceptions, it was prevented by time and language constraints. However, the results of prior local surveys utilising semi-structured and group discussion techniques were made available to the author for comparison with questionnaire results.

4.4.4 Personal Observation

The period of time spent conducting research in the field allowed for an extensive amount of personal observation. Although formal participant observation was not chosen as a research method, substantial contextual information was collected from informal interactions with a variety of stakeholders, including tourists, hotel and restaurant staff, and park staff. The most valuable of these was the time spent with independent tourists, given the age, language and cultural similarities between the researcher and individuals from this group.

It was also possible to conduct impartial observations of tourist behaviour in KNP and gateway towns, and to conduct a visual assessment of visitor impacts as part of field-based interviews of park staff (Chapter 6). This method relies on subjective interpretation, and can be unreliable if the observer is not exposed to a wide range of experiences and scenarios. As described, time constraints have limited a comprehensive application of this method. In this study, personal observation has only been cited where it augments more formal methods of appraisal.

4.4.5 Local Discussion Groups

The preliminary findings and observations were presented at a three-day local workshop on sustainable tourism (Chapter 10). This presented an opportunity for discussion of relevant issues with a variety of stakeholders, including KNP staff, the local community, local businesses, tour operators and NGOs. It allowed the conclusions of the researcher to be further contextualised and improved, and provided a forum for different opinions and attitudes to be raised simultaneously, and common ground explored.

Group discussion is a valuable research tool which is becoming more commonly adopted in rural appraisal studies (Samarasekara, 1996). In this study its principal goal was to incorporate the views and needs of all the relevant stakeholders in the development of appropriate recommendations for the management and development of tourism in and around KNP.

4.5 Framework of Field Research

Fieldwork was conducted during a number of visits to the site in 1995 and 1996. A total of approximately three and a half months was spent in the field over a period of eighteen months. Additional work was undertaken by local counterparts during interim periods.

April-May 1995

This visit of approximately one month served as an introduction to the study site. Key informants were identified and used to provide essential contextual information and to direct the researcher to existing sources of information. Data pertaining to tourism in the park was identified and collected from records and accounts held by the park. Pilot visitor questionnaires were conducted, and a framework for the major visitor survey (Chapter 7) was developed with park staff. Semi-structured interviews were conducted with key informants regarding visitor impact and management in the park. These included field-based interviews during which the researcher was able to augment the testimony of the informant with personal observation. An initial inventory of tourism enterprises in gateway towns was carried out with a local counterpart, and a framework developed for local assistants to conduct surveys of tourism enterprises.

On return to the UK, the visitor questionnaire was adapted and despatched to Indonesia for distribution by a park employee. The time frame for the visitor questionnaire was July - November 1995. Half of the responses were returned to the UK in September 1995. The other half were collected by the researcher in March 1996. A preliminary survey of local tourism enterprises was conducted by local assistants during August 1995.

March - April 1996

Approximately 2 weeks were spent in the study area conducting follow-up research. A further year of detailed data from park records was collected. In addition, a workshop was held with representatives of the park, local government, local tourism entrepreneurs, tour operators and the local community. This served to disseminate some of the results of the study and obtain feedback from a variety of stakeholders with regard to park management and tourism. The proceedings of this workshop are presented elsewhere (Goodwin et al., 1996), although some of the results are referred to in this thesis (Chapter 10).

July - September 1996

Approximately 2 months were spent conducting the final period of fieldwork. The major emphasis of this trip was to collect detailed information on the economic contribution of tourism to local communities, and to conduct research into local perceptions and attitudes towards tourism and conservation.

An updated inventory of tourism enterprises was compiled and, building on the preliminary survey carried out a year before, a comprehensive survey of hotels, restaurants, shops and charter boats was conducted to elicit visitation, revenue and employment data. The author participated in hotelier interviews whilst questionnaires of other entrepreneurs were conducted by local assistants. A questionnaire survey of visitors to the gateway town of Labuan Bajo was conducted to elicit spending patterns in the town. In addition, data on visitor arrivals was collected from local government sources and park records to supplement and update previously collected data.

A questionnaire survey of local people was translated into Indonesian and conducted by local assistants in the two gateway towns and the village on Komodo Island. All data collection was completed during this visit, and a preliminary report of field research submitted to the park director and the head of the tourist office in Labuan Bajo.

4.6 Summary of Key Themes

- This study was conducted as part of a comparative research project investigating the role of protected area tourism in conservation and local development in three countries; India, Indonesia and Zimbabwe
- A key facet of the research project was the development of rapid, cost-effective methodological tools for use by local researchers in evaluating the performance of protected area tourism. An integrated approach, using a number of tools from both the natural and social sciences, was employed.
- Numerous sources of secondary data were exploited, along with structured and semi-structured questionnaires and interviews. Primary and secondary data were augmented with observation and discussion. As far as possible, triangulation using multiple sources of evidence was employed to validate and cross-check findings.

- **Fieldwork was conducted by the author over three and a half months during three visits to the study area in 1995 and 1996. Data were also collected in intervening periods by local researchers.**

5. Komodo National Park Visitor Patterns

5.1 Introduction

Patterns of tourism are constantly changing. There may be temporal changes in the volume of tourist traffic to a destination, either directionally, cyclically or both. The spatial distribution of visitors at a destination may also be uneven and change over time. In addition, characteristics of the visitors themselves may vary in the form of a tourist typology (Cohen, 1972; Cochrane, 1993a). The type of visitor and visitation will affect the level of impacts, both ecological and economic, which tourism has on a destination (Krippendorf, 1987; Lea, 1988; Cole, 1995b). It is assumed that the type of visitor and patterns of visitation associated with alternative forms of tourism, such as ecotourism, result in more sustainable development than those associated with mass tourism. Thus it is an important prerequisite for studies of tourism impact to identify and measure these patterns.

This is an essentially exploratory chapter, that examines the nature of tourism to KNP and attempts to identify patterns in the visitation profile of the park. Four areas of enquiry are focused upon;

- What temporal patterns can be identified in visitor arrivals to KNP, and how do they differ from Indonesia as a whole?
- What is the nationality breakdown of visitors to KNP, and how does this differ from Indonesia as a whole?
- What temporal and spatial patterns can be identified in visitor activity within KNP?
- Can a typology of visitors to KNP be constructed from arrival and activity patterns?

The first two questions examine whether tourism to KNP is different from general tourism, using arrivals to Indonesia as an indicator of general tourism trends. The third and fourth questions establish patterns amongst visitor and visitation which are used in subsequent chapters when examining the impacts of tourism on conservation and local development. Data sources and statistical methods are presented in Section 5.2. This is followed by analyses of visitor arrivals to KNP compared with those to Indonesia (Section 5.3), visitor nationalities for KNP compared with Indonesia (Section 5.4), and spatial and temporal

activities within KNP (Section 5.5). The concluding discussion considers the implications of arrival and activity patterns, and develops a tourist typology of arrivals to KNP (Section 5.6).

5.2 Methods

5.2.1 Temporal Patterns of Arrivals to KNP and Indonesia

A time variable such as visitor arrivals comprises three main components (Bradley and South, 1981). Firstly, the *secular trend*, or long-run movement (growth or decline). Secondly, the *seasonal cycle*, a cyclical variation over the period of a year. Seasonality is a common feature of tourism, driven by climate and socio-cultural factors such as the timing of holiday-taking around religious festivals or school holidays in originating countries, or dates of regular cultural events in destination countries (Lea, 1988). Thirdly, *irregulars*, variation which cannot be explained by the trend or cycle components, and which may be a result of chance events such as political unrest or the outbreak of disease. Each of these components was analysed separately and then combined in an overall growth model.

Monthly visitation data were available from the park headquarters for thirteen years, from April 1983 - March 1996. Monthly data regarding international arrivals to Indonesia were available from January 1983 to December 1993 from the Directorate General of Tourism in Jakarta. Monthly data were used to analyse seasonality, and were also compiled into annual (April to March) totals for analysis of growth rates.

Annual growth rates were calculated as percentages of the previous year's arrivals. Seasonal indices were calculated for each month using a multiplicative, centred moving average model (Bradley and South, 1981). Weighted centred moving averages were calculated, and seasonal indices derived by dividing the actual monthly value by the appropriate average. Index values greater than unity signify above-average visitation, whilst those below unity signify below-average visitation. The magnitude of the index value indicates the strength of the seasonal factor. Both monthly and quarterly seasonal indices were calculated, using weighted thirteen-month and weighted five-quarter centred moving averages respectively. 1-way ANOVAs were performed on the quarterly index data to assess the significance of seasonal differences.

Irregulars for each quarter were derived by subtracting the centred moving average from the deseasonalised quarterly arrival figure. Deseasonalised figures were derived by dividing the

actual arrival figure by an average seasonal index. Average quarterly seasonal indices were calculated using only the six most recent years of data, to control for long-run secular changes in seasonality.

Two stepwise multiple regressions were performed in order to identify the key components in overall growth of arrivals to both KNP and Indonesia as a whole. Quarterly visitor arrivals were used as the dependent variable. A secular trend variable and quarterly dummies were included as independent variables.

5.2.2 Nationality Patterns of Visitors to KNP and Indonesia

Annual arrivals to KNP since 1983/84 have been classified as either domestic or foreign. This has permitted an examination of the annual growth in tourism in terms of differential rises in foreign and domestic visitation.

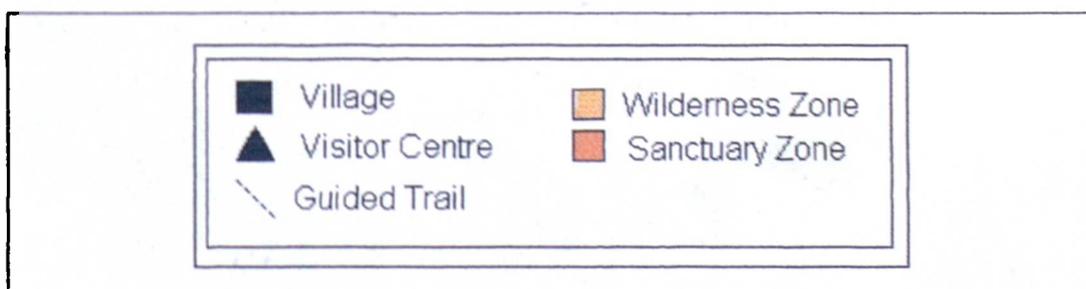
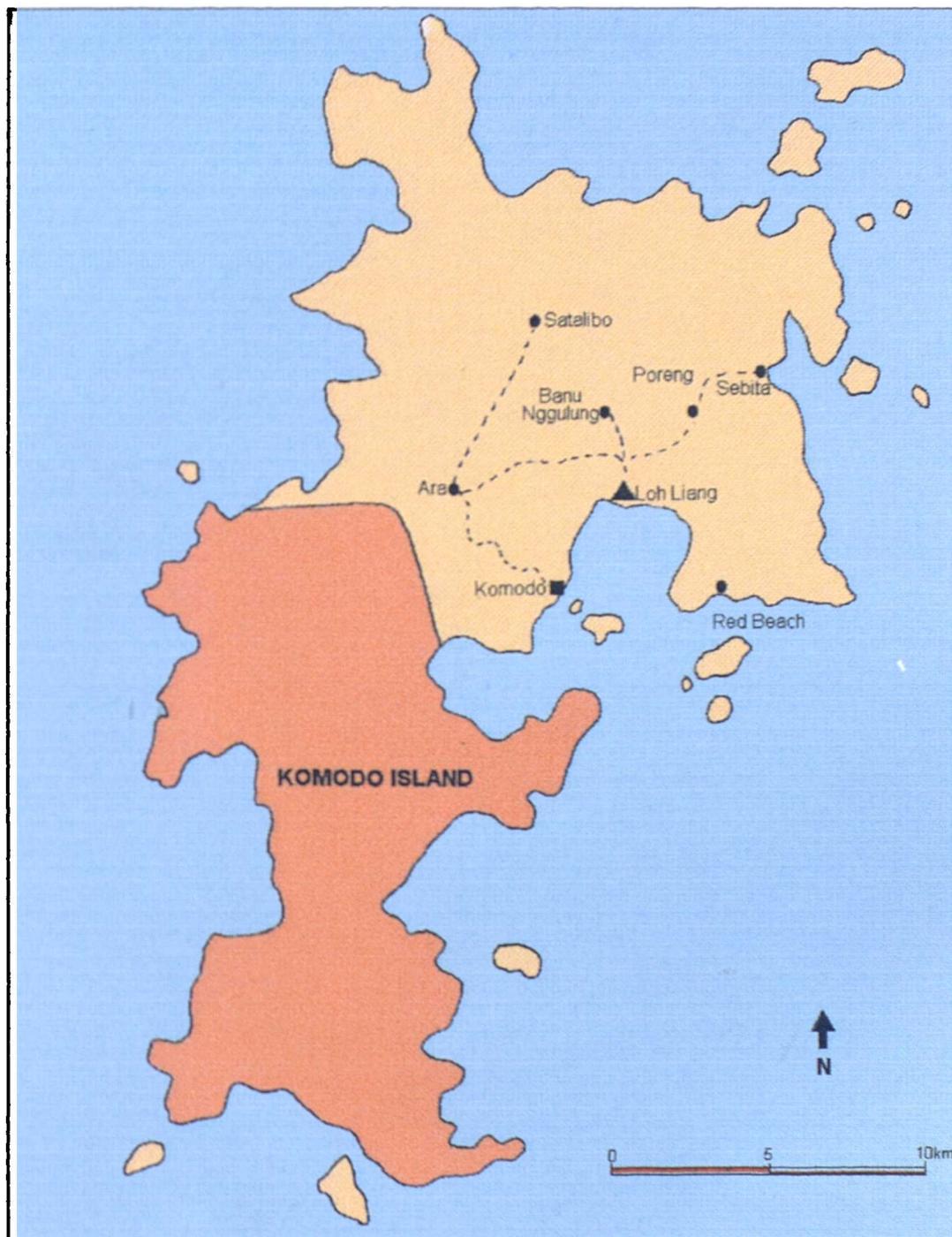
Monthly visitor arrivals compiled by nationality were available from park headquarters for the period from April 1990 - March 1996. Both annual and seasonal patterns of arrival by different nationalities, and compiled by continent, were analysed. A comparison of foreign arrivals to KNP with arrivals to Indonesia was made for 1995, the latest year for which comparable data were available.

5.2.3 Visitor Activity Patterns Within KNP

Temporal and spatial patterns of visitor activity within the park were examined, focusing on mode of transport to the islands, length of stay on the islands, and inter- and intra-island spatial distribution. Data on mode of transport (ferry, charter boat or cruise ship¹) and length of stay was collected in raw form from park visitor books at the visitor centres on each island. This data was collected for the 1995/96 year and compiled into monthly totals. Monthly compiled data on spatial distribution and length of stay were available from park visitor books, and were collected for the three years from April 1993 - March 1996. Accounting error amongst the different sources of data on KNP arrivals has resulted in

¹ there are also some arrivals by private yacht, but these amount to only 0.4% of arrivals and so have been excluded from this analysis

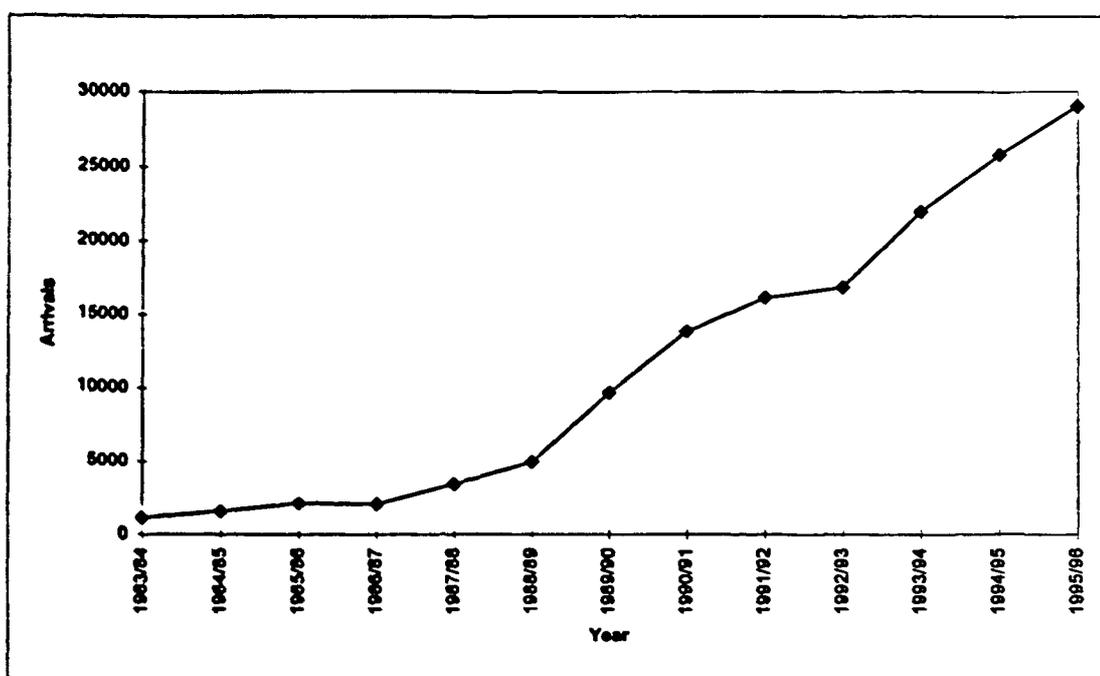
Figure 5.1 Map of Komodo Island Showing Trail Network.



some small discrepancies in monthly totals between sources. To account for this, comparisons are only made between data from the same source.

On Komodo Island there are opportunities to undertake a number of different guided trails around the northern part of the island (Fig.5.1, and Section 3.5). Visitors may also snorkel or dive at Red Beach. Records are kept of each guided walk; the date, group size, and destination, from which it was possible to compare the use of different trails. However, no data are available on the use of Red Beach by visitors.

Figure 5.2 Total Annual Arrivals to KNP, 1983/84 - 1995/96.



5.3 Patterns of Visitation

5.3.1 Secular Trend

There has been considerable growth in annual arrivals to KNP from 1983 to 1996. There were 1140 visitors in 1983/84, and this had increased over 25-fold to 28,991 in 1995/96. Although growth has been irregular, visitor arrivals have shown a rapid rise throughout the late 1980s and 1990s (Fig. 5.2). The average annual growth rate over the thirteen year period has been 33.4%. Growth has slowed somewhat in recent years, the average for the five years from 1991/92 - 1995/96 being 16.3% (see Appendix Table A.1).

Figure 5.3 Annual Arrivals to KNP and Indonesia, 1983/84 - 1992/93.

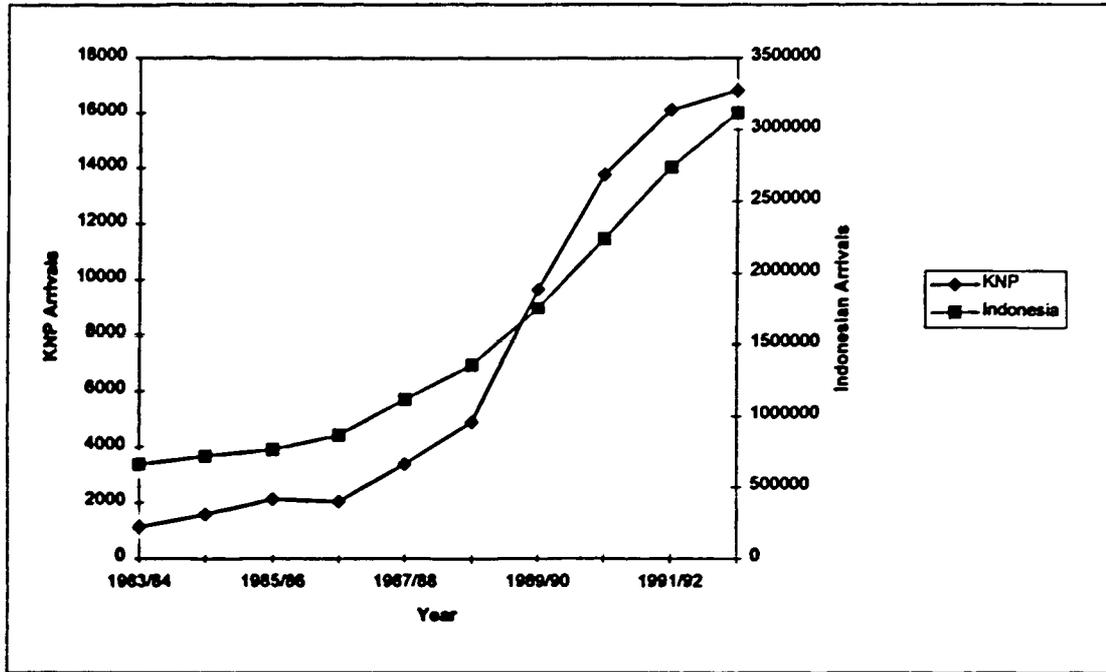
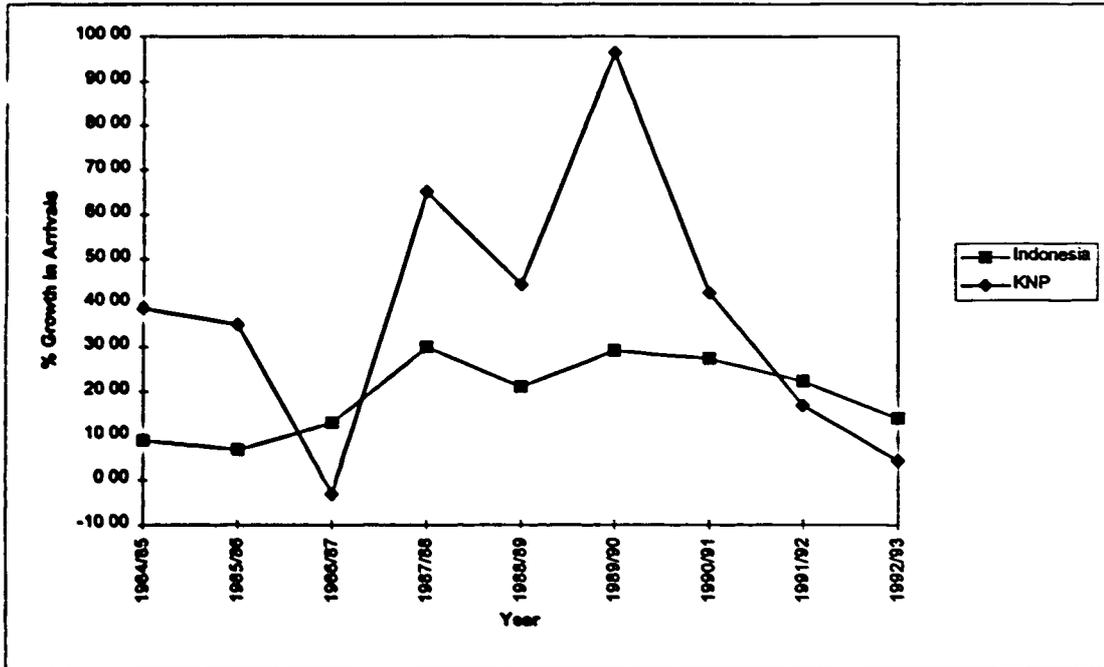


Figure 5.4 Annual Growth Rates in Arrivals to KNP and Indonesia, 1983/84 - 1992/93.



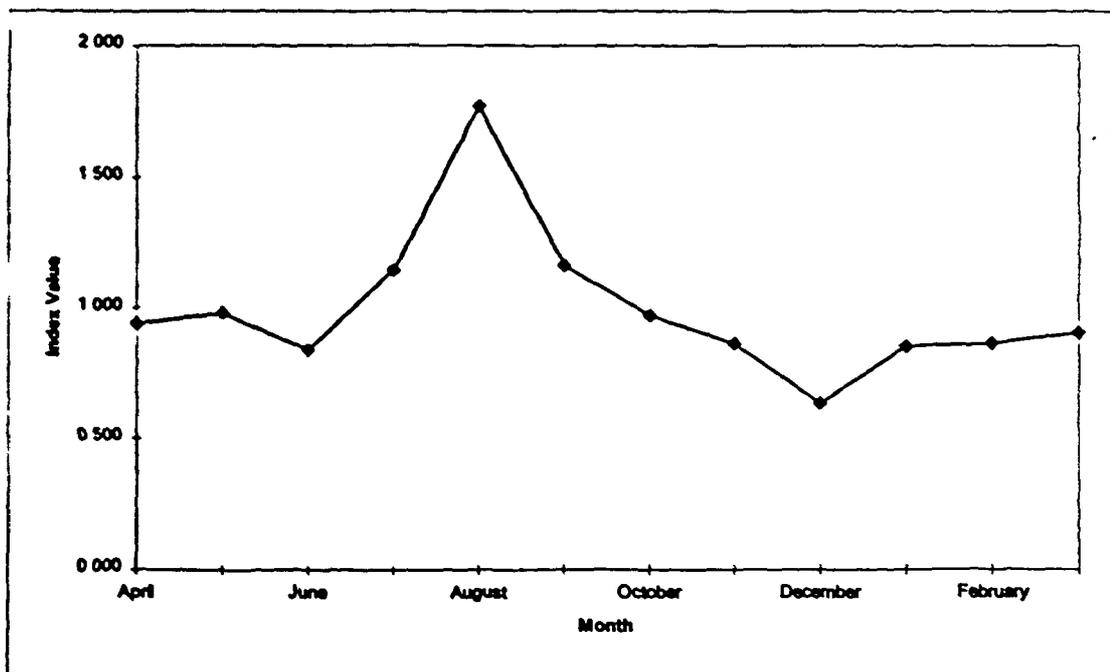
Indonesian visitation has also shown impressive growth since the mid 1980s. However, the growth in KNP visitation, although more erratic, has generally been higher than that for

Indonesia as a whole; over the ten year period from 1983/84 - 1992/93, the park averaged growth of 37.8% whilst the country averaged growth of 19.2% per annum (Figs. 5.3 - 5.4, and Appendix Table A.6).

5.3.2 Seasonal Cycle

The monthly indices show a clear peak in August (Fig.5.5). Both monthly and quarterly indices reveal that in the first few years of data the seasonal pattern was irregular, whilst over the last nine years the third quarter (July - September) has assumed a strong peak (Figs. 5.6- 5.7, Appendix Tables A.2-A.3). These differences were significant ($F_{3,44}=27.68p<0.0001$); the mean third quarter index value was significantly higher than the other three, which were not significantly different from each other (Table 5.1).

Figure 5.5 Average Monthly Seasonal Indices for KNP Arrivals, 1983/84 - 1995/96.



There is only mild seasonal variation in arrivals to Indonesia. The quarterly seasonal indices for the ten year period from 1983/84 - 1992/93 vary between 0.9 and 1.1, whilst those for KNP over the same period vary between 0.6 and 1.5 (Figure 5.8 and Appendix Table A.7). Also, whereas KNP displays a strong third quarter peak, Indonesia as a whole displays weak third and fourth quarter peaks.

Figure 5.6 Quarterly Seasonal Indices for KNP Arrivals, 1983/84 - 1995/96.

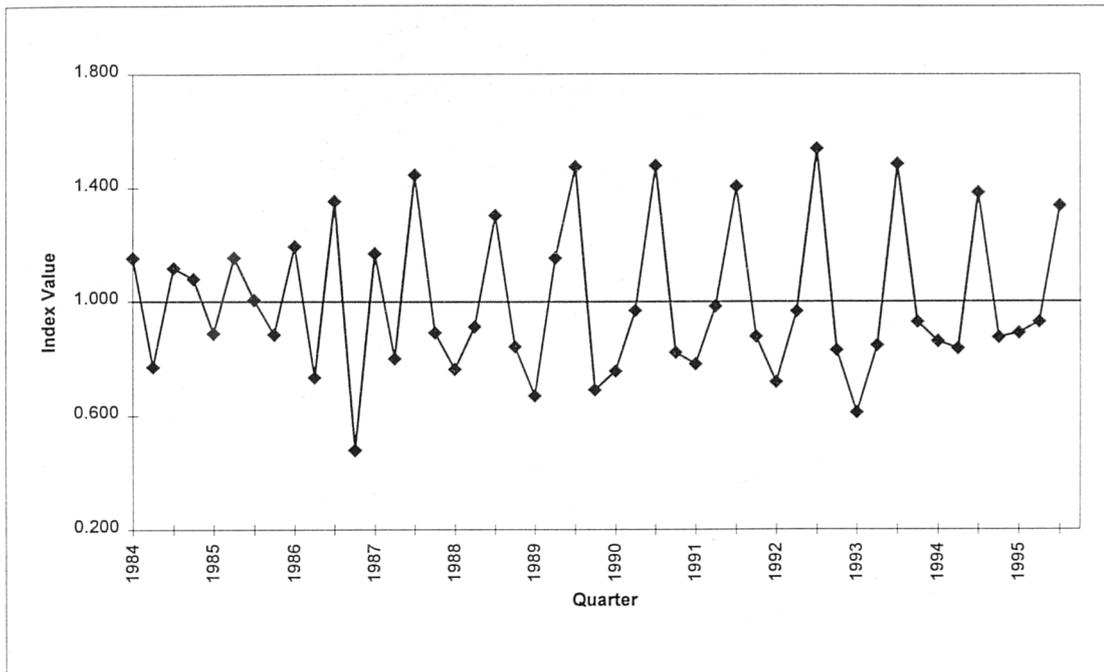


Figure 5.7 Separated Quarterly Seasonal Indices for KNP Arrivals, 1983/84 - 1995/96.

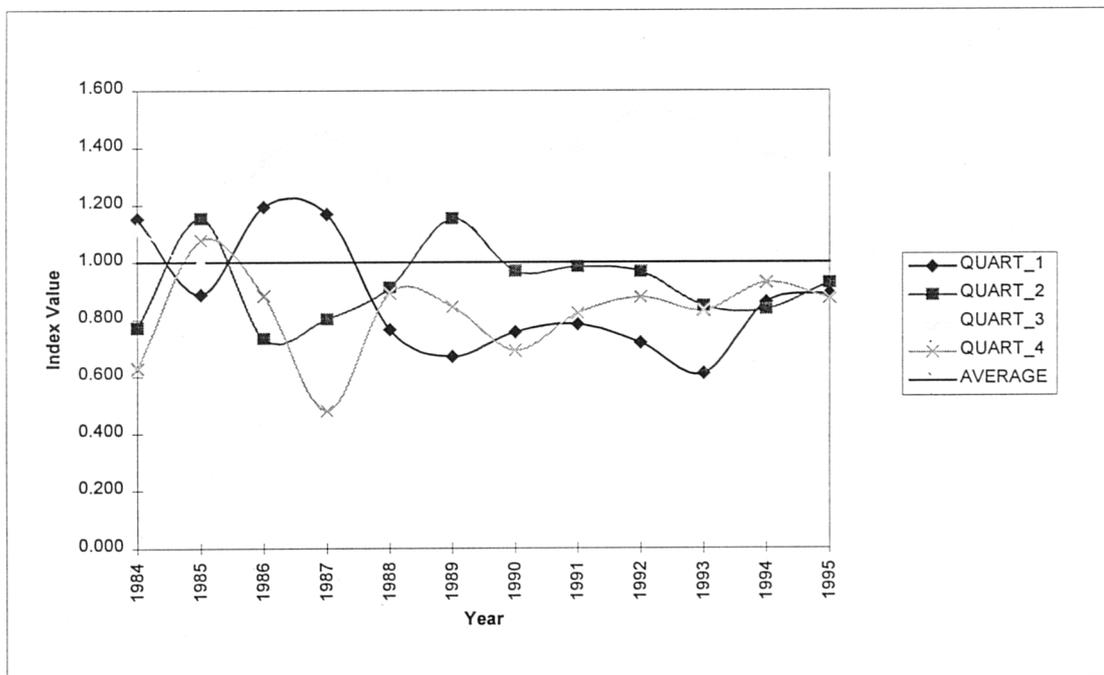


Figure 5.8 Quarterly Seasonal Indices for KNP and Indonesian Arrivals, 1983/84 - 1995/96.

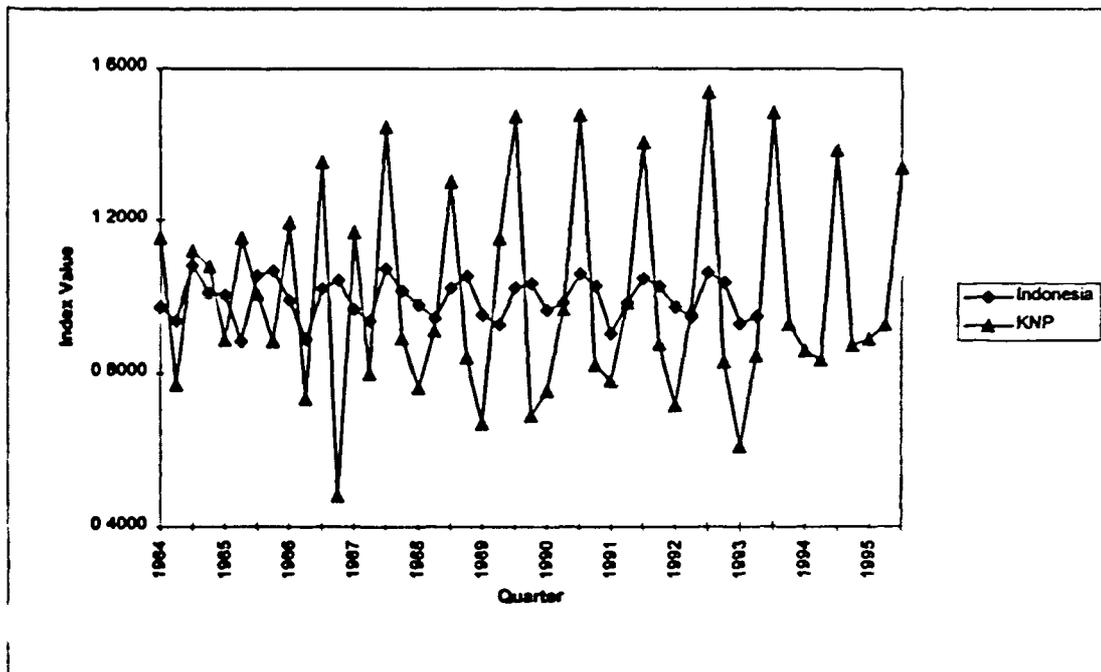


Table 5.1 1-Way ANOVAs Comparing Average Quarterly Seasonal Indices in KNP and Indonesian Arrivals Data.

	d.f. between groups	d.f. within groups	F-ratio	F-prob	Mean	95% confidence intervals	
<i>KNP Arrivals</i>	3	44	27.68	p<0.0001			
1st Quarter					0.87	0.75	1.00
2nd Quarter					0.92	0.84	1.01
3rd Quarter					1.36	1.26	1.46
4th Quarter					0.82	0.72	0.92
<i>Indonesian Arrivals</i>	3	35	41.12	p<0.0001			
1st Quarter					0.96	0.94	0.99
2nd Quarter					0.94	0.91	0.96
3rd Quarter					1.05	1.03	1.07
4th Quarter					1.04	1.02	1.05

A 1-way ANOVA performed on the Indonesian quarterly index data showed significant differences between the four quarters ($F_{3,35}=41.12, p<0.0001$); the mean third and fourth quarter index values were found to be significantly higher than those of the first and second quarters (Table 5.1).

5.3.3 Irregular Variation

Quarterly irregulars for KNP for the six most recent years of data are shown in Fig. 5.9 and Appendix Table A.3. Irregular variations are small and random until the first quarter of 1993. The larger irregular variation from thereon may have other explanations. The first and second quarters of 1993 illustrate depressed arrival figures, which may have been a response to the earthquake in Flores in December 1992. The first and fourth quarters in the following two years have greater than average arrivals, whilst the second and third quarters have lower than average arrivals. This systematic deviation indicates a weakening of the seasonal trend, which is borne out by the seasonal indices in Appendix Table A.2. The greater than average arrivals in the traditionally low season quarters is a function of the onset of large cruise ship visitation in these months (Section 5.5).

Quarterly irregulars in Indonesian arrivals appear small and random until 1990 (Fig. 5.10 and Appendix Table A.7). In the second quarter of 1990 there is an unexplained positive deviation. The negative deviation in the first quarter of 1991 may have been a response to the outbreak of the Gulf War (EIU, 1991). However, the compensating peak in the second quarter could indicate accounting error. The same explanation could be used for the compensating deviations in the first and second quarters of 1993, although the trough in the first corresponds to that for KNP associated with the Flores earthquake.

Figure 5.9 Quarterly Irregulars in KNP Arrivals, 4th Quarter 1989 - 3rd Quarter 1995.

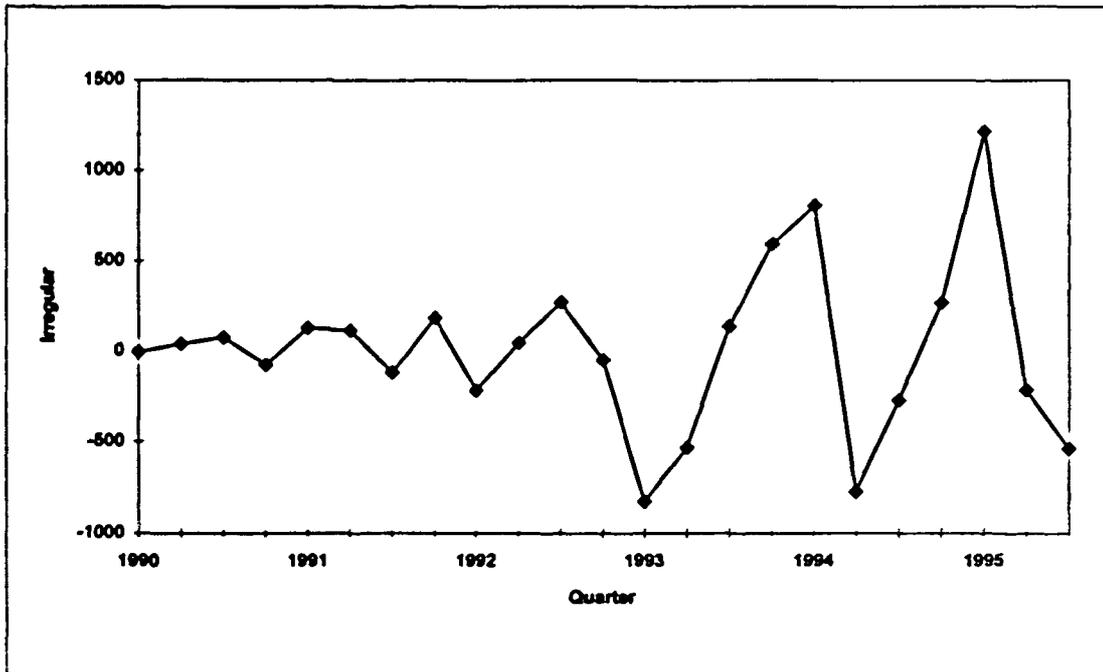
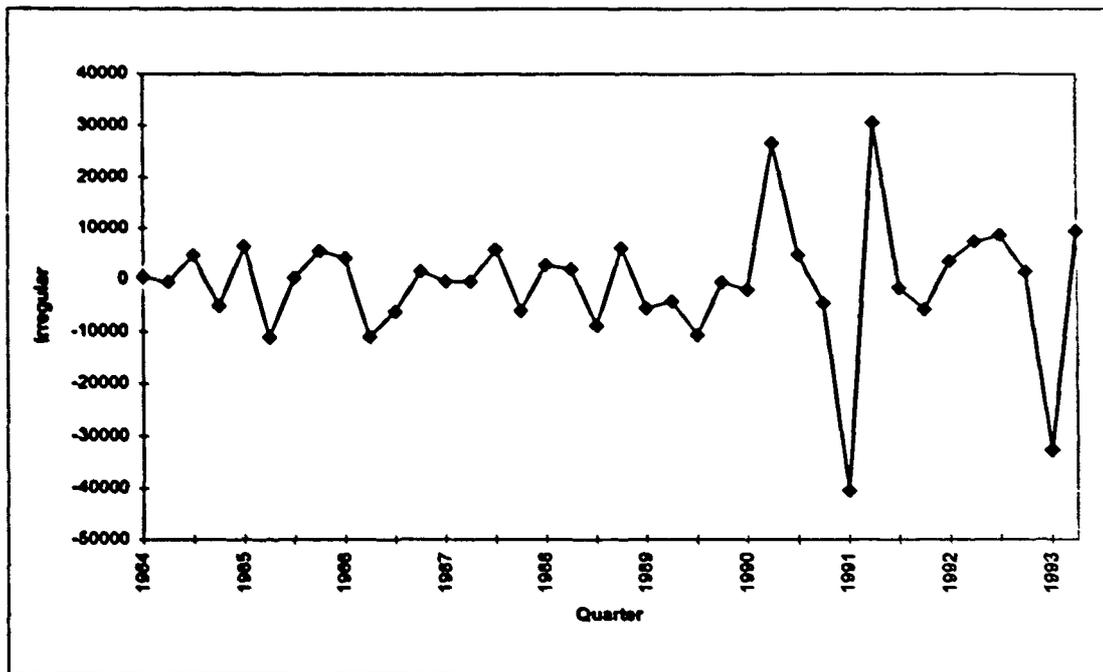


Figure 5.10 Quarterly Irregulars in Indonesian Arrivals, 1983/84 - 1992/93.



5.3.4 A Model for the Growth of Tourism

Two variables contributed significantly to the fit of the model for the growth of visitation to KNP; the secular trend variable and the dummy variable for the third quarter. The adjusted R^2 value of 0.875 with these variables included indicates a good fit to the data (Table 5.2). This suggests that seasonal cycles and secular growth have both been important factors in the pattern of arrivals over the time period examined.

A similar model for the Indonesian data also indicated a good fit (adjusted $R^2 = 0.913$), although in this case only the secular trend variable contributed significantly to the model (Table 5.2). This indicates that seasonality is weaker in Indonesian arrivals patterns.

Table 5.2 Stepwise Multiple Regression of Secular Trend and Quarterly Seasonal Variables on Quarterly Arrivals to KNP and Indonesia.

Variable	Multiple R	R-square	Adjusted R-square	Coefficient (B)	Standard Error (SE B)
<i>KNP Arrivals</i>	0.938	0.880	0.875		
Time				152.4	8.33
Dummy_3				1547	288.7
Constant				-1571	264.8
<i>Indonesian Arrivals</i>	0.957	0.915	0.913		
Time				18712	888.7
Constant				6217	22447

5.4 Nationality Patterns of Visitors to KNP and Indonesia

The increase in visitor arrivals to KNP since 1987/88 consists almost entirely of foreign tourists (Fig. 5.11). The annual number of domestic visitors has stayed fairly constant over the past twelve years. Until 1994, total domestic arrivals fluctuated around 1000 visitors, but have increased to around 2000 arrivals the past two years. Of total visitors from 1983/84 - 1995/96, 10.9% have been domestic. However, the annual average is 24.0%, and there has been a decrease from 40-60% in the mid-1980s to under 10% in the 1990s (Appendix Table A.1).

Figure 5.11 Annual foreign and domestic arrivals to KNP, 1983/84 - 1995/96

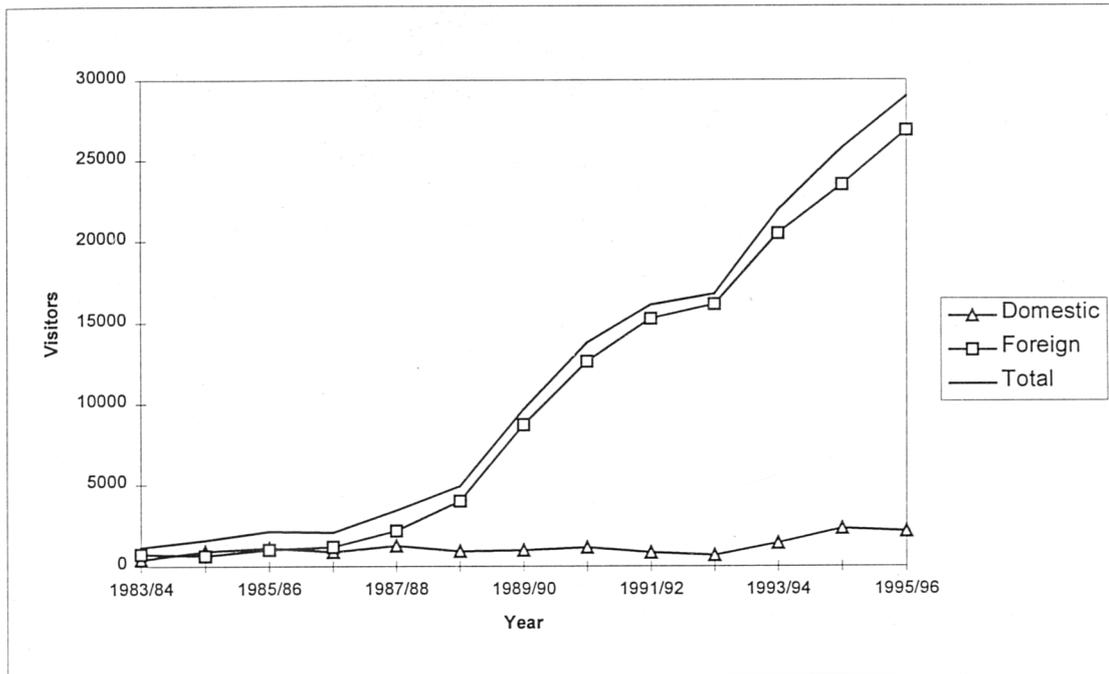
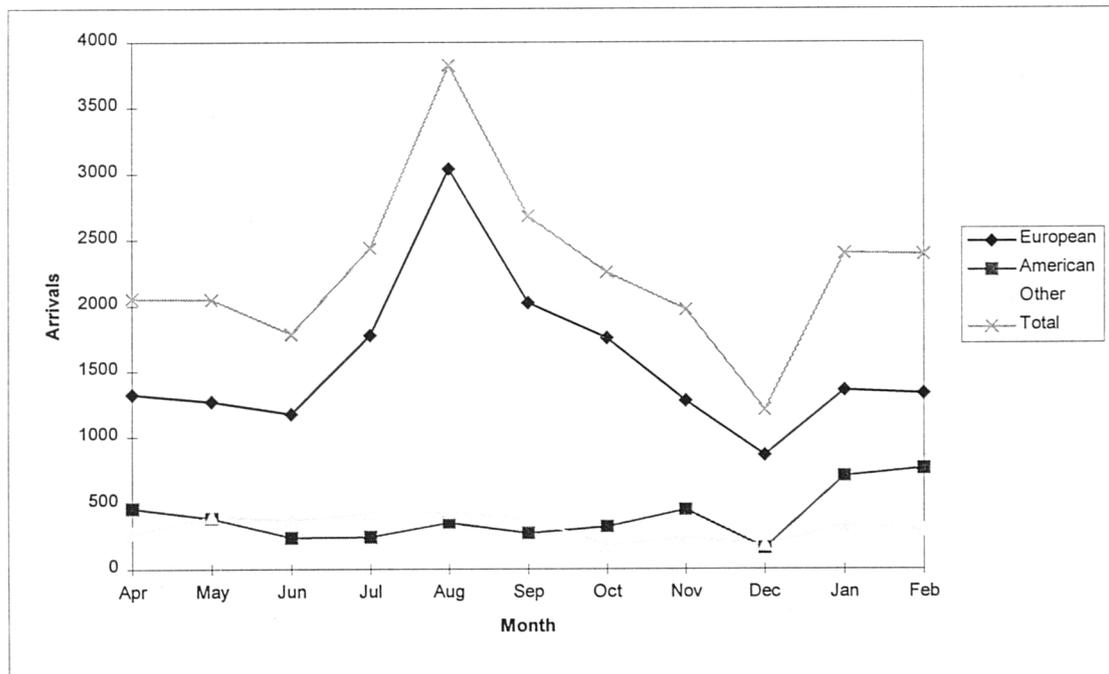
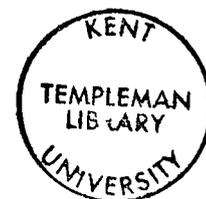


Figure 5.12 Monthly arrivals to KNP by continent of origin, 1995/96



On a continental basis, Europeans accounted for 63.5% of the total arrivals in 1990/91-1995/96, whilst North Americans accounted for 19.4% (Table 5.3). Asians (including Indonesians) comprised 9.2% of arrivals, and Australasians comprised 7.3%. Other continents



accounted for less than 1% of all visitors to KNP. The top four nationalities (American, German, Dutch and British) accounted for 59.6% of all arrivals to KNP.

Table 5.3 Visitors to KNP grouped by continent of origin, 1990/91-1995/96.

Continent of origin	Total Number of Arrivals	% of Total Arrivals
Europe	77,107	63.5
North America	23,533	19.4
Asia	11,177	9.2
Australasia	8,908	7.3
Rest of World	767	0.6

There is little annual variation in arrivals by continent between 1990/91 and 1995/96 (Appendix Table A.4). However, seasonal variation is apparent (Fig.5.12, and Appendix Table A.5). The seasonal peak in arrivals in 1995/96 in the European summer months is a result of a surge in European visitors to the park at this time. However, the low-season peak in January and February is the result of a slight increase in Americans (Fig.5.12).

Foreign visitors to Indonesia in 1995 were predominantly (67.4%) Asian. Europeans comprised 18.4% of arrivals, whilst other continents comprised only 14.3% (Table 5.4). However, of foreign visitors to KNP in the same year, only 3.3% were Asian. The majority were European (68.1%) and American (18.3%).

Table 5.4 Arrivals to Indonesia and Komodo National Park split by continent, 1995.

Continent	Arrivals to Indonesia	% of Total Arrivals to Indonesia	Arrivals to KNP	% of Total Arrivals to KNP
Europe	793842	18.4	17610	68.1
America	201149	4.7	4741	18.3
Australasia	348833	8.1	2478	9.6
Asia	2915065	67.4	865	3.3
Other	65340	1.5	155	0.6
TOTAL	4324229	100.0	20532	100.0

5.5 Visitor Activity Patterns Within KNP

5.5.1 Mode of Transport to the Park

19.5% of visitors to Komodo Island in 1995/96 used the government ferry, of which 14.9% arrived from Sape and 4.6% arrived from Labuan Bajo (Table 5.9). 31.9% of visitors used charter boats, of which 13.7% were from Sape, 8.2% from Labuan Bajo and 10.0% were from Lombok. Half of the visitors (48.7%) travelled to the island by cruise ship.

There are no data from previous years, so it is not possible to compare how the relative importance of different modes of transport has changed over time. However, an earlier report suggested that the average proportions of visitors by ferry, charter and cruise ship over the previous five years had been similar to those above (USDA, 1994). The same report suggested that arrivals by ferry were increasing at a faster rate than those of other modes of transport, probably due to the increase in ferry services to a daily service in each direction. However, the past two years have witnessed an erratic ferry service, and more visitors have relied on charter boats. The Bali Sea Dancer cruise ship also began to visit Komodo Island in November 1994. This ship is the most frequent and one of the largest to visit the park, accounting for 52% of cruise ship arrivals in its first full year of activity. It may therefore be the case that visitors by ferry are declining next to those by charter boat and cruise ship. This may explain the drop in overnight visitors to the park (Section 5.5.2).

Monthly totals for arrivals by each type of transport for the year reveal that charter boat visits all show a peak between July and September (Fig. 5.13 and Appendix Table A.9). Ferry arrivals from Sape show a July and August peak, although arrivals from Labuan Bajo do not display any seasonality. Cruise ship arrivals, unusually, show a peak in January and February, with the rest of the year remaining fairly constant. This is a result of low season visits by large cruise ships which distort the seasonal pattern (see Appendix Table A.10). If cruise ship arrivals are removed from the data, the monthly seasonal pattern of arrivals for 1995/96 has a more defined seasonal peak in August (Figure 5.14). This suggests that large cruise ships have a significant impact on seasonality of visitation to the park.

Figure 5.13 Monthly arrivals to KNP by mode of transport, 1995/96

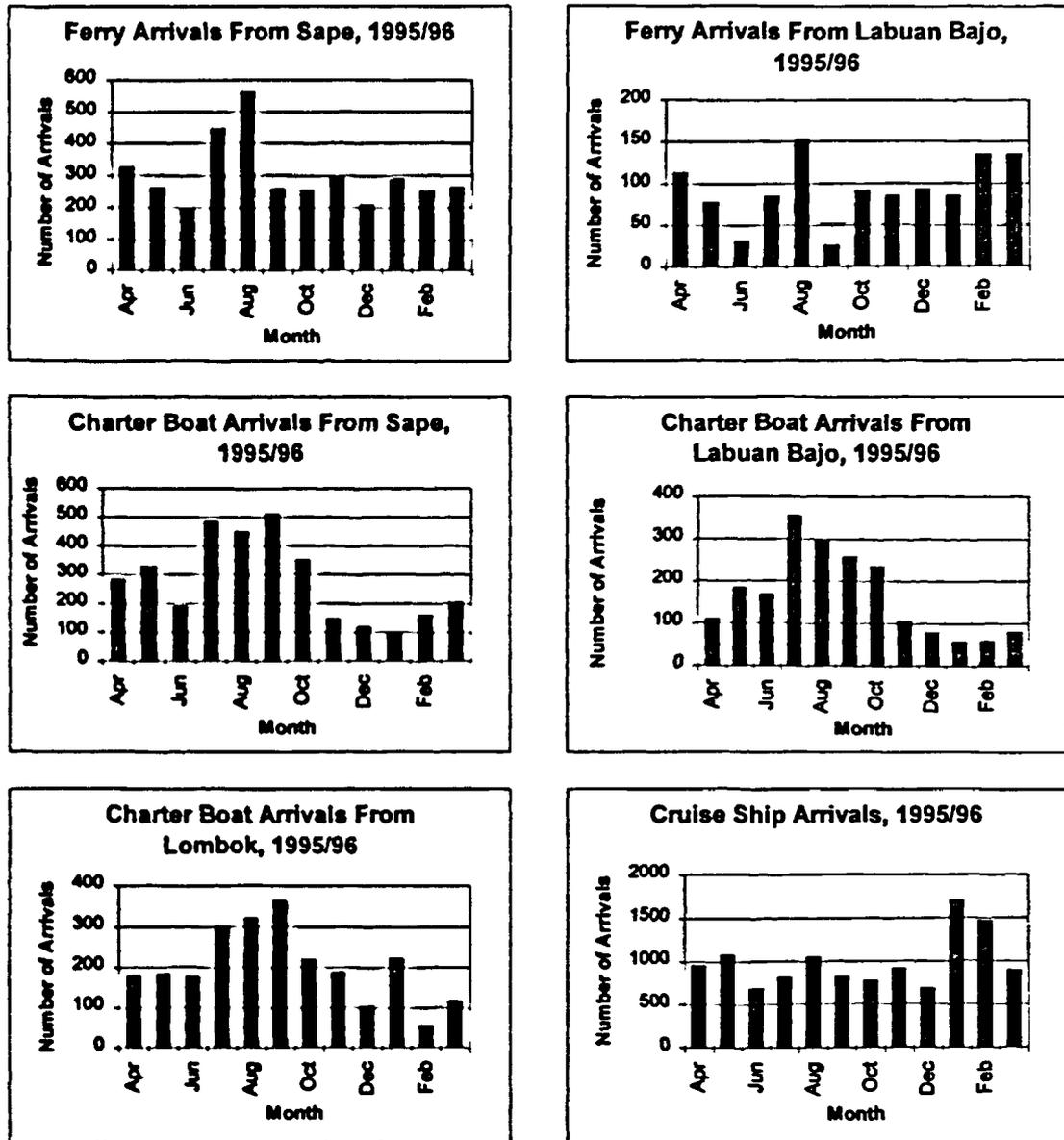
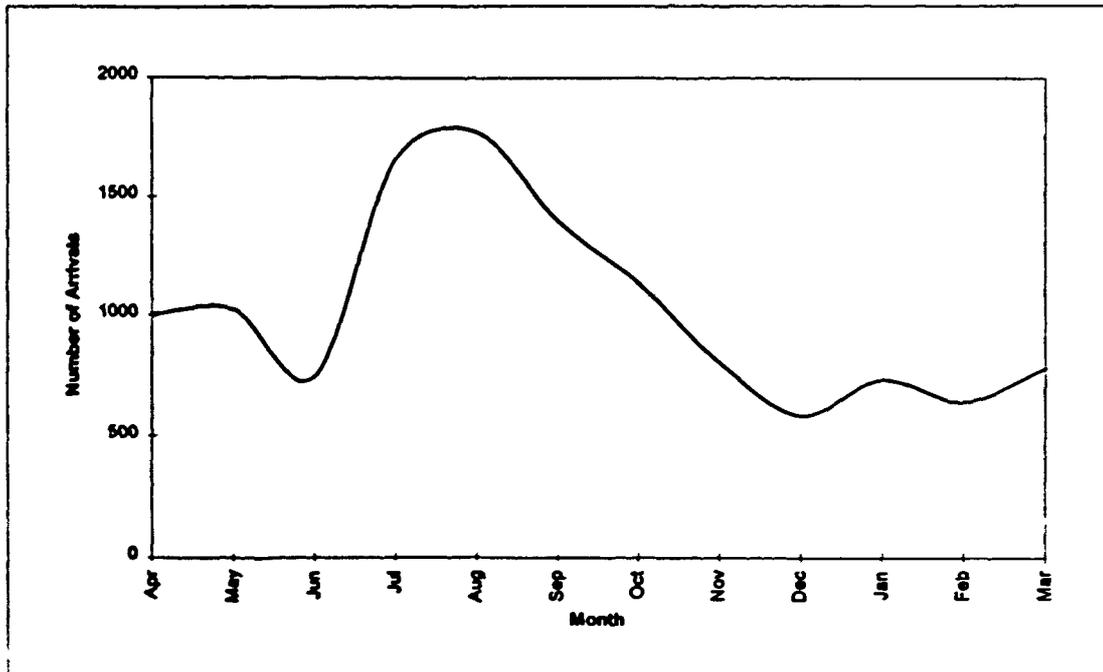


Figure 5.14 Monthly arrivals to KNP excluding cruise ship passengers, 1995/96



5.5.2 Length of Stay

28.7% of visitors to Komodo Island stayed overnight (Table 5.5). However, there has been an annual decline from 36.7% in 1993/94 to 24.5% in 1995/96. In real terms the number has also dropped between 1993/94 and 1995/96. Only 1.3% of visitors to Rinca Island stayed overnight during the two years from April 1994 - March 1996, and again the annual figure has fallen in both proportional and real terms. Although figures are unavailable for the 1996/97 season, park staff perceived a further drop in overnight visitors during the first half of the year (Rohman, *pers.comm.*).

Overnight visitors to Komodo Island stayed for between 1 and 9 nights during 1995/96. The vast majority (85.6%) stayed for one night only, whilst only 1.68% of overnight visitors stayed for more than two nights (Table 5.6). The mean length of stay of *overnight* visitors to Komodo Island in 1995/96 was 1.18 nights (median/mode = 1).

Table 5.5 Number and Proportion of Overnight Visitors to Komodo and Rinca Islands, 1993-1996.

	93/94	94/95	95/96	TOTAL
KOMODO				
Total Visitors	18,625	21,357	24,159	64,141
Overnight Visitors	6,834	5,685	5,915	18,434
% Overnight	36.7	26.6	24.5	28.7
RINCA				
Total Visitors	n/a	4,253	4,832	9,085
Overnight Visitors	n/a	74	42	116
% Overnight	n/a	1.7	0.9	1.3

Table 5.6 Overnight visitors to Komodo Island classified by length of stay, 1995/96.

Length of Stay (nights)	Number of Visitors	% of Overnights	% of Total
0	18,737		77.80
1	4,574	85.56	18.99
2	682	12.76	2.83
>2	90	1.68	0.38

Monthly totals for overnight visitors exhibit some seasonality, with July to September being the busiest months (Figure 5.15). Overall bed occupancy over the year averaged 34%, with a low of 21% in December and a high of 60% in August. On particularly busy days in August, demand has occasionally exceeded supply, and visitors have been forced to sleep on the floor of the cafeteria.

5.5.3 Spatial Distribution Within the Park

There are visitor centres on both Komodo and Rinca Islands, and both receive substantial numbers of arrivals. The majority of visitors go to Komodo Island (83%, Table 5.7). However, the seasonal peak in August is more defined for Rinca than it is for Komodo (Figure 5.16). The difference in patterns of seasonality between the two islands are a result of the more complex transport network serving Komodo.

Figure 5.15 Monthly overnight visitors to Komodo island, 1993/94 - 1995/96

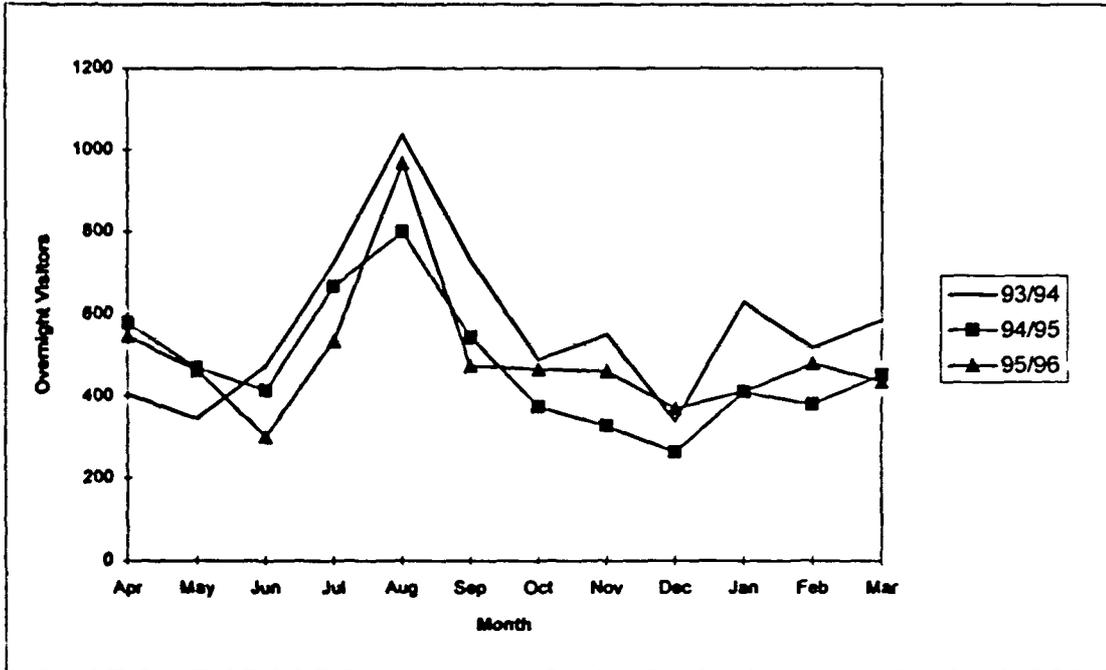


Figure 5.16 Monthly arrivals to Komodo and Rinca islands, 1994/95 - 1995/96

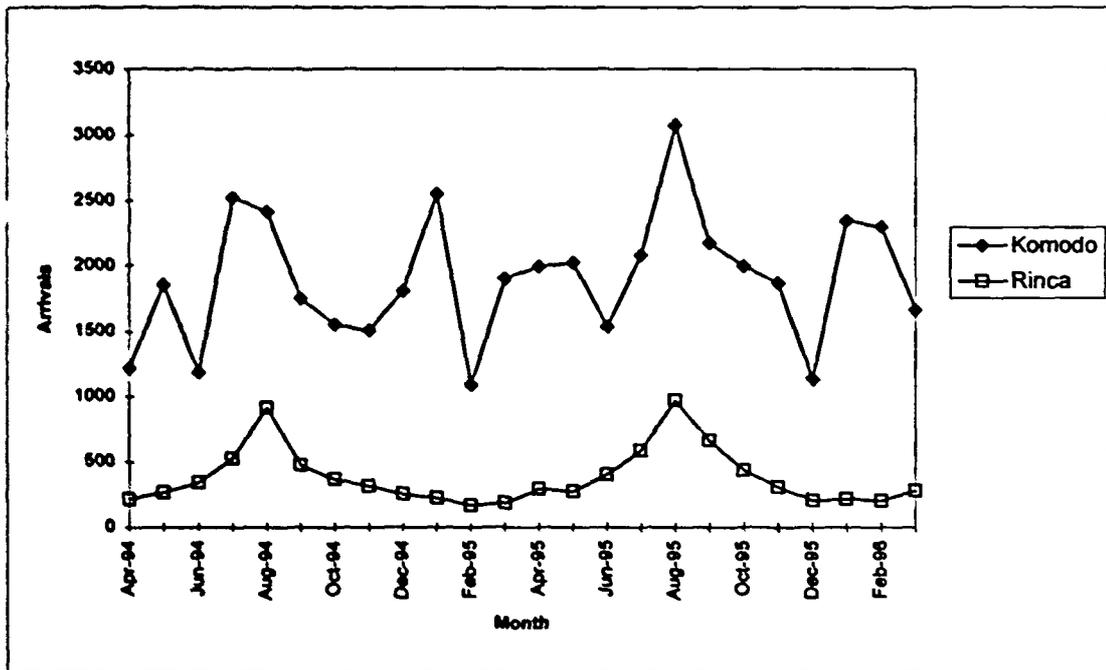


Table 5.7 Monthly Arrivals to Komodo and Rinca Islands as Proportions of Total Park Visitation, 1994-1996.

Year	Komodo	Rinca	Total	% Komodo	% Rinca
1994/95	21,357	4,253	25,610	83.4	16.6
1995/96	24,159	4,832	28,991	83.3	16.7

Virtually every visitor to Komodo walks the 2km trail to Banu Nggulung to visit the site where the Komodo monitors used to be fed. Several animals still frequent this site and it offers the best chance of seeing the animals outside of the camp area. Trails to destinations other than Banu Nggulung receive very little use by visitors (Table 5.8). 2.7% of visitors to Komodo used guided trails other than that to Banu Nggulung. The Gunung Ara trail is clearly the most popular of the alternative trails, used on average by 261 visitors (1.2%) each year. The second most common alternative to the Banu Nggulung trail is a forest walk off the trail, undertaken by an average of 189 visitors (0.9%) each year. The monthly pattern of visitor use for these two trails is fairly erratic, although there was an August peak in the use of the Gunung Ara trail in 1994 and 1995 (see Appendix Table A.8).

Table 5.8 Spatial Distribution of Visitors on Alternative Trails on Komodo Island, 1993/94 - 1995/96.

Trail	93/94	94/95	95/96	Average
Gunung Ara	221	299	263	261
<i>% of Arrivals</i>	<i>1.2</i>	<i>1.4</i>	<i>1.1</i>	<i>1.2</i>
Jalan Hutan	243	249	75	189
<i>% of Arrivals</i>	<i>1.3</i>	<i>1.2</i>	<i>0.3</i>	<i>0.9</i>
Other Trails	78	136	189	134
<i>% of Arrivals</i>	<i>0.4</i>	<i>0.6</i>	<i>0.8</i>	<i>0.6</i>
Total Alternative Trail Use	542	684	527	584
<i>% of Arrivals</i>	<i>2.9</i>	<i>3.2</i>	<i>2.2</i>	<i>2.7</i>

5.5.4 Mode of Transport vs. Length of Stay and Spatial Patterns

Data for overnight visitors on Komodo Island for 1995/96 grouped according to mode of transport are shown in Table 5.9. Virtually all ferry passengers stayed overnight, whilst no cruise ship passengers and only 0.3% of Lombok charter passengers stayed overnight. Of the

local charter boat passengers, 17.4% of those from Sape stayed overnight whilst 7.2 % of those from Labuan Bajo did so.

Ferry passengers stayed for an average of 1.2 nights (median/mode = 1). Local charter passengers stayed for an average of 0.2 nights (median/mode = 0). The average length of stay of Lombok charter passengers was only 0.01 nights (median/mode = 0) (Table 5.9). These findings are intuitive, given that charter boats and cruise ships offer on-board accommodation in contrast to the government ferry. Therefore, ferry passengers have little choice but to stay at least one night on the island, since only one ferry stops at the park each day in each direction, both at around noon.

Table 5.9 Relationship between Mode of Transport and Length of Stay for Visitors to Komodo Island, 1995/96.

Mode of Transport	Arrivals by Mode of Transport	% of Total Arrivals	Overnight Visitors	Bed Nights	Mean Length of Stay	% of Visitors Staying Overnight
Ferry Sape	3,588	14.9	3,557	4,243	1.2	99.1
Ferry Labuan Bajo	1,097	4.6	1,061	1,234	1.1	96.7
Charter Sape	3,296	13.7	572	634	0.2	17.4
Charter Labuan Bajo	1,968	8.2	141	188	0.1	7.2
Charter Lombok	2,407	10.0	15	15	0.0	0.6
Cruise Ship	11,727	48.7	0	0	0.0	0.0
TOTAL	24,083		5,346			22.2

The standard daily charter or cruise visit without an overnight stop effectively prevents these visitors from attempting walks other than that to Banu Nggulung. Thus only ferry passengers, who generally stay overnight, have the opportunity to conduct these walks. However, those passengers on charter boats and cruise ships have a greater opportunity to snorkel or dive at Red Beach since they have access to means of transport to the beach whilst ferry passengers do not.

5.6 Discussion

5.6.1 Patterns of Growth

KNP is a relatively new destination with rapidly expanding growth, primarily in foreign visitation. The increasing domination of the visitor arrivals by foreign tourists reflects the opening up of Indonesia and the active promotion of tourism to foreign markets in the late 1980s, as well as improvements in transport services east of Bali. However, it is noticeable that KNP visitors have a different nationality profile from overseas visitors to Indonesia in general. Whereas Indonesia attracts mainly Asian visitors, KNP is essentially a European and American destination. The difference in appeal of wildlife tourism may be culturally based (Cochrane, 1993a) or it may be a function of differences in marketing between originating countries.

The heavier reliance on European and American visitors may explain the greater seasonality in arrivals to KNP when compared with Indonesia as a whole. Indonesia is considered fortunate in exhibiting little by way of seasonal variation in international arrivals (EIU, 1991). By contrast, KNP is exposed to seasonal overcrowding with the associated detrimental effects on visitor satisfaction and the park environment. Seasonality also increases the vulnerability of local enterprises which are likely to be exposed to greater competition at peak times and to a significant drop in income during low seasons. Cruise ships visiting in off-peak months may have reduced the seasonal differences in arrivals in recent years. However, this has not eased overcrowding, but simply added to it on days when cruise ships arrive with large volumes of passengers. It has also not eased the vulnerability of local businesses in low-season periods because cruise passengers have no contact with the local community (Chapter 8). The difference in the type (nationality) of visitors to KNP may therefore have resulted in a *less* sustainable pattern of tourism growth than for Indonesia as a whole.

The erratic growth rates and recent large deviations from predicted trends suggest that KNP as a tourist destination is vulnerable to external factors, one of which may have been the 1992 Flores earthquake. In this respect it does not differ from other destinations which are dependent predominantly on international arrivals (McNeely, 1989). The outbreak of pneumonic plague near Goa depressed arrivals to India in 1996 (Goodwin *et al.*, 1997b), whilst political unrest has deterred tourists from visiting numerous developing countries (Kayanja and Douglas-Hamilton, 1984; Lea, 1988; Child and Heath, 1990).

Clearly KNP is achieving continued high growth, which is cause for optimism amongst those who perceive tourism to be a vital economic justification for the continued existence of parks. However, this optimism must be tempered by the fact that the unpredictability and seasonality associated with international tourism render the park and surrounding communities as vulnerable as any other developing destination.

5.6.2 Patterns of Activity

KNP is essentially a single-attraction destination with a single principal visitor experience, namely a day visit with a 2-3 hour round trip to see the Komodo dragons at Banu Nggulung. The two principal supplements to this are an overnight stay on Komodo Island, taken by ferry passengers, or a day visit to Rinca Island, taken by some charter passengers. Some visitors may also snorkel at Red Beach.

The emphasis on Komodo Island is the result a number of factors. Komodo is better known, has a longer history of visitation and more developed visitor facilities than Rinca. Komodo is the only island with an established viewing area for the Komodo dragons, and as such offers guaranteed dragon viewing for even brief visits, with the minimum of effort. In contrast the experience on Rinca is more demanding, and visitors are less assured of seeing adult dragons. It is also the case that Komodo Island is served by a more comprehensive transport network than Rinca. It is a scheduled stop on the route of the government ferry between Sumbawa and Flores, and as such is the more accessible of the two for budget travellers. It is also the only island to be visited by cruise ships from further afield.

The low levels of use of the alternative trails on Komodo arise from a number of contributing factors. Principal amongst these is time. The shortest trail is a 5-6 hour round trip from camp, and all must be started at dawn to avoid strenuous hill walking in the heat of the day. Therefore, only overnight visitors have access to these walks, and only physically fit visitors are likely to undertake them. Additional factors were highlighted in the responses to the visitor questionnaire administered at Loh Liang (see Chapter 7). A lack of information about these walks, and the perceived prohibitive cost of hiring a guide to conduct them, were the chief reasons why they were not undertaken by many overnight visitors.

It is unclear to what extent the current activity patterns of visitors are dictated by park management, visitor demand, or the timetables of tour and transport operators. Historically, park management has promoted the emphasis on the Banu Nggulung experience by maintaining regular provisioning at the site. This has until recently been fuelled by visitor demand, leading to increased levels of provisioning and increased volumes of visitors (although a converse trend in visitor demand fuelled by perceptions of overcrowding and artificiality on Komodo has led to an increase in arrivals to Rinca). Transport patterns, in particular cruise ship operations, have developed in line with this limited excursion into the park because it suits tour schedules. Currently, management policy with regard to the tourist experience in the park is moving away from the short, artificial encounter with the dragons at Banu Nggulung. However, its ability to change patterns of visitation may be constrained by the control upon the type of visitation which transport operators command.

Whilst the short visit with an easy walk to see the dragons may be all that the majority of visitors wish from their visit to the park, it is more likely to be a function of tight tour schedules which do not permit more than a minimum time within the park. This is supported by the results of a pilot questionnaire of cruise ship passengers which found that 63.4% would have liked to have stayed longer on the island than their tour allowed (Chapter 7). Conversely, whilst some ferry passengers may have chosen a means of transport that allows a longer, overnight stay in the park, others may have chosen it for financial reasons and been forced into staying overnight when they would otherwise have chosen not to. Length of stay, and hence access to other activities within the park, is strongly related to mode of transport, which suggests that consumer choice or park management are less important than transport provision in dictating the type of visitor activity. This is further source of vulnerability to which the park is exposed.

5.6.3 Towards a Tourist Typology for KNP

Mode of transport plays an important part in the way that visitors interact with KNP. Differences in length of stay and activities within the park will have an effect on the environmental impacts and financial contribution which visitors make to the park. In addition, the mode of transport which visitors select will affect their interaction with the local economy surrounding KNP. The following is a summary of the characteristics of each mode of transport, with regard to their likely contributions to the park and the local economy;

Table 5.10 Characteristics of Visitation by Different Modes of Transport

Transport	Overnight in Park (Y/N)	Use Other Trails (Y/N)	Visit Rinca (Y/N)	Local Contact Around Park
Ferry	Y	Y	N	High
Charter Labuan Bajo	N	N	Y	High
Charter Lombok	N	N	Y	High
Charter Sape	N	N	Y	Low
Cruise	N	N	N	None

- **Ferry**

Independent travellers, who stay longest in the park, and are virtually the only visitors to stay overnight and to participate in guided walks other than that to Banu Nggulung. These visitors stay overnight in Labuan Bajo, and may stay overnight in Sape. Some may also visit Rinca by charter from Labuan Bajo.

- **Charter from Labuan Bajo and Lombok**

Mostly independent travellers, undertaking a standard brief visit to Komodo Island, with very few staying overnight in KNP. 95% of visitors to Rinca Island travel by this method. These visitors also stay overnight in Labuan Bajo, and some may travel on to Sape by charter or to/from Sape by ferry.

- **Charter from Sape**

These visitors are virtually all package tourists. Tours are booked through operators in Bali and Bima. They undertake a standard brief visit to Komodo Island, with occasional visits to Rinca Island as an alternative to Komodo. They pass through Sape, and occasionally may continue to Labuan Bajo.

- **Cruise Ships**

These are affluent package tourists, embarking and disembarking in Bali or further afield. Cruise ship passengers have minimal contact with KNP (many are routed away from the cafeteria and shop), although they may constitute the majority of visitors to Red Beach. They are isolated from any contact with local communities on either side of KNP or within it.

When considering the impacts which different types of tourist have for conservation and local development, certain differences emerge. In terms of potential expenditure within the park, independent travellers by ferry can be distinguished from other visitors by the nature of their length of stay. Similarly, in terms of environmental implications, ferry passengers (i.e. overnight visitors) will have a different effect to other visitors. When considering the likely impact on the local economy, three classes of visitor can be identified; independent travellers (by ferry and charter) who stay overnight in adjacent gateway towns; package charters (charter from Sape), who pass through Sape without staying there, and; cruise ship visitors, who are effectively isolated from surrounding communities. However, within the independent traveller group, there will be differences between those that use charter boats and those that do not.

The situation is undoubtedly complex, and many other factors besides mode of transport will determine the impacts caused by different types of tourists. However, mode of transport is a useful and practical indicator for differentiating between tourist types. In the following three chapters, the classes of visitor identified above, based on mode of transport, will be compared with regard to their environmental impacts (Chapter 6), contribution to park income (Chapter 7), and contribution to the local economy (Chapter 8).

6. VISITOR IMPACTS AND MANAGEMENT

6.1 Introduction

The first assumption of ecotourism is that it is ecologically sustainable and does not conflict with the conservation priorities of the area upon which it is based (Chapter 1). However, numerous ecological impacts of tourism have been identified (Chapter 2). Trampling and soil compaction may lead to losses in plant species richness, diversity, biomass and health (Bell and Bliss, 1973; Liddle, 1975; McDonnell, 1981; Cole, 1995a). Changes in species composition may be brought about by impacts on recruitment (Burden and Randerson, 1972; Liddle, 1975; Cole and Landres, 1995) or the import of exotic species (Lonsdale and Lane, 1994). Wildlife disturbance may lead to physiological stress and behavioural changes, ultimately affecting survival and productivity (Cott, 1969; Kury and Gochfeld, 1975; Anderson and Keith, 1980; Anderson, 1995; Gabrielson and Smith, 1995; Garber and Burger, 1995; Knight and Cole, 1995a). Litter and waste associated with tourism has a variety of impacts at both habitat and organism levels, polluting soil and water, creating a fire hazard and posing dangers to both terrestrial and marine wildlife (Boo, 1990; Tyack, 1996). The extent and types of impact which occur are a complex function of the type of visitor, the type and intensity of activity undertaken, the nature of the environment, and seasonal factors.

This chapter examines the ecological impacts of tourism, and the monitoring and management of these impacts, within KNP. It attempts to assess the ecological implications of tourism within the context of the conservation priorities of the park, particularly the preservation of the Komodo dragon populations, and the additional ecological threats posed to the park by external factors. It also considers the impacts of different types of visitors, using the typology developed in Chapter 5.

The principal visitor activity in KNP is dragon viewing which until recently was effected by the provisioning of wild dragons with goats at a viewing site on Komodo Island (Chapter 3). A principal concern associated with supplementary feeding of wild animals has been the associated danger, to people, of habituated animals acting aggressively in their search for food items (e.g. elephants and baboons in sub-Saharan Africa). However, there are also a number of effects on the behaviour and welfare of target species, especially where regular baiting is practised. Habituation to baiting at a regular site may result in behavioural shifts, particularly: (1) increased local densities in a population; (2) increased intraspecific

aggression resulting in increased injury and mortality rates; and (3) nutritional dependence on the bait (McDougal, 1980). It has also been suggested that body size and reproduction in baboons has been affected by provisioning (Tyack, 1996). Provisioning has now ceased in KNP, due to concern over the detrimental effects on the dragon population. This chapter examines the short term effect of provisioning on local dragon density by comparing before and after group sizes with those observed during feeding. Other ecological effects on the dragons are inferred from these results.

Visitor impacts in KNP are not confined to the dragons. Other ecological impacts of tourism are examined with reference to wildlife disturbance, habitat change, freshwater consumption and the spread of litter and other waste. The focus is mainly on terrestrial impacts, although some marine impacts are also considered. In addition, other non-tourism-related ecological impacts within the park are considered in an effort to contextualise visitor impacts within the overall framework of ecological management and protection in KNP.

Protected area management has evolved to deal with the ecological impacts of tourism and the uncertainties of the complex relationship between tourism and the environment. Practical measures for controlling visitation and ameliorating visitor impacts are being placed within an overall concept of adaptive management which relies on setting limits of acceptable change and monitoring indicators to identify when limits are being exceeded (Stankey *et al.*, 1985). The efficacy of management will determine the sustainability of tourism within a protected area. This chapter examines visitor impact management in KNP and considers the effects of management decisions on the ecological sustainability of tourism in KNP.

Section 6.2 describes the methods used to examine visitor impacts and management. Results are presented in Section 6.3, divided into four topics. Firstly, an analysis of the specific impact of provisioning of dragons using existing time series data. Secondly, an examination of visitor impacts in general, identified through interviews and observation. Thirdly, visitor impacts are contextualised within the wider framework of ecological pressures on the park. Finally, an assessment of the current status of visitor impact management in KNP. The chapter ends with a discussion of the findings (Section 6.4).

6.2 Methods

In common with the majority of national parks there is an absence of comprehensive long-term data sets and baseline information against which to compare the current situation. As such, a fully quantitative analysis of the ecological effects of tourism is difficult (see Chapter 2). However, this research did not aim to undertake a detailed quantitative analysis of the ecological effects of tourism in the park, but rather to examine how tourism interacts with conservation on an ecological basis. As such, an alternative approach was employed, utilising available existing data, surveys of key informants and direct observation.

6.2.1 The Impact of Provisioning on Dragon Density

The KNP staff have in recent years established procedures for monitoring the Komodo dragon population. Two forms of survey are carried out regularly; an annual population survey on Komodo and Rinca islands, and a daily count of dragon group size at the Banu Nggulung viewing site. Neither of these methods are much more than *ad hoc* counts (see Chapter 3), nevertheless they are the only current and regular forms of data collection carried out. Existing data from these surveys were collected from KNP records during visits to the park in 1995 and 1996.

Three annual surveys of the dragon population have been undertaken by KNP staff to date. These occur in October each year, having commenced in 1993. Permanent plots have been established (47 on Komodo, 29 on Rinca). At each annual survey, bait is secured at each permanent plot, and an observer placed nearby. The number of dragons visiting the bait over a 24hr period is recorded, along with the sex and age class of each individual.

Daily counts of the number of dragons at the Banu Nggulung viewing site are conducted by KNP staff when visiting the site with tourists. These counts have been recorded since 1990, although for some months data are missing. The most common time for visits is in the early morning, when dragons are most active and the temperature is cooler, making walking easier. Hence, most records of counts relate to that time of day. However, the time of count is not always recorded, and on some days multiple counts are made at different times of day. For the purposes of this study, where more than one count has been made in a day the maximum count has been used. Daily dragon counts were compiled as monthly averages for analysis.

Multivariate statistical analysis was employed to examine the data. However, prior to analysis, an examination of the distribution of counts revealed a bimodal distribution rather than a normal distribution. In order to better approximate to normality the sample was divided into two subsets; counts during provisioning and counts after the cessation of provisioning. Each subset was analysed separately.

Stepwise multiple regressions were performed on each subset, with average daily counts each month as the dependent variable. A number of independent variables were included. For the 'during provisioning' subset these included a secular trend variable, eleven monthly dummy variables, whether or not provisioning took place, the number of feeds per week and the number of goats per week. For the 'after provisioning ceased' subset, only the secular trend and monthly dummy variables were included.

Both of the subset distributions displayed mildly negative skewness and kurtosis. This was reduced by using a reflected square root transformation (Tabachnick and Fidell, 1989). However, using the transformed data resulted in worse fits of the models to the data, and so it was discarded in favour of the untransformed data.

6.2.2 General Ecological Impacts of Tourism, Visitor Management, and Other Ecological Threats to KNP

Information regarding visitor impacts, monitoring and management was collected using a questionnaire, administered as semi-structured interviews with key personnel, such as park rangers and managers. The format was adapted from the instrument used by Giongo *et al.* (1993) to examine visitor management in protected areas globally. Interviews focused on the following questions.

- What are the conservation priorities, and other values, of the park (Chapter 3)?
- What ecological problems does tourism present, and is it in conflict with the conservation priorities of the park?
- What are the other ecological threats to the park, how important are tourism impacts in relation to other threats, and what relationships exist between tourism and other impacts?

- What types of monitoring and management are in place to limit the ecological impacts of tourism?

In addition, a rapid environmental appraisal of site and visitor management was carried out. This was conducted as a modified form of field transect whereby a park ranger or other key personnel travelled around a site with the researcher and relayed details of management, impacts and mitigation in response to the visual prompts of his surroundings. The researcher made direct observations whilst undertaking these transects. Trails to Banu Nggulung, Gunung Ara and Poreng were walked on Komodo island and visually assessed. The width of the bare part of the path to Banu Nggulung was also measured every 100m to assess trail condition. A circular trail was walked on Rinca island and visually assessed. This forms the basic route at the heart of a network of short cuts and extensions which make up the visitor trail network on Rinca. The snorkelling site at Red Beach was also visited.

6.3 Results

6.3.1 The Effects of Provisioning on Local Dragon Density

- **Analysis of Daily Counts at Banu Nggulung**

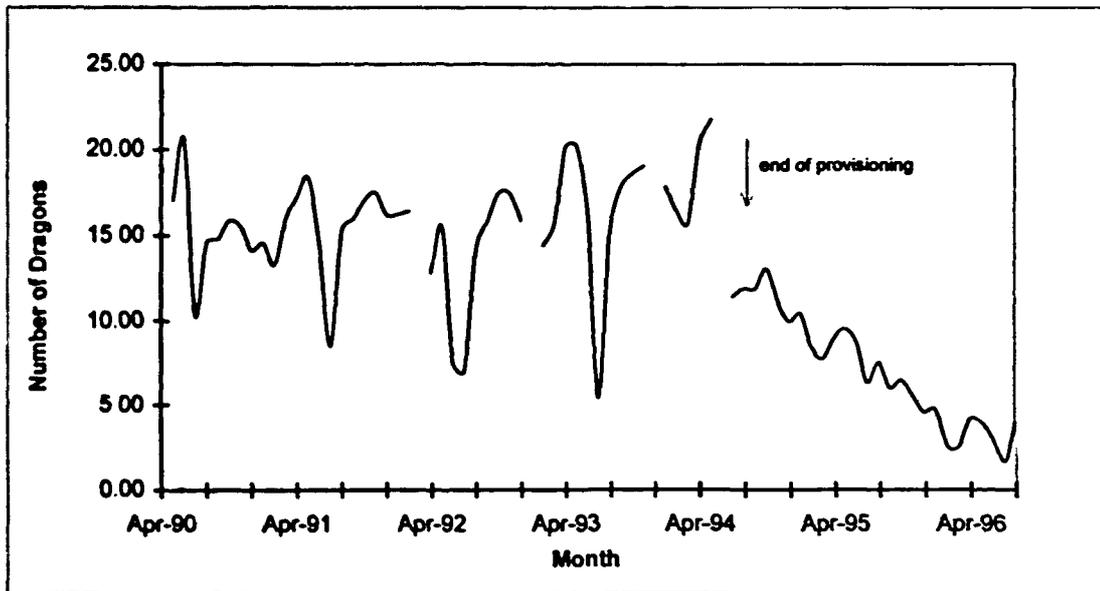
The average daily dragon count each month, from April 1990-August 1996, is shown in Fig.6.1. Two principal patterns emerge from these data:

- Whilst provisioning continued at Banu Nggulung, there was a marked seasonal pattern to the counts. A high concentration of individuals at the site for most of the year gave way to a trough in the counts each year during July.
- Upon the cessation of provisioning, the number of individuals seen at the site began to fall, and continued to fall to below the level of the seasonal troughs witnessed in previous seasons.

Analysis of the 'during provisioning' subset of the data showed that three variables contributed significantly to the fit of the model predicting dragon numbers at Banu Nggulung; two seasonal dummies and the number of feeds per week. R for regression was significantly different from zero ($F(3,43)=23.52, p<0.0001$), and an R^2 value of 0.621 indicated a good fit to the data. The first variable to enter the equation was the seasonal dummy for the month of

July ($B = -7.68$, $p < 0.0001$), which had a large negative effect on the count and corresponds to the seasonal troughs in the data (Fig.6.1). The second variable to enter the equation was the number of feeds per week ($B = -2.53$, $p < 0.01$), which had a smaller negative effect on the count. The last variable to enter the equation was the seasonal dummy for May ($B = 2.34$, $p < 0.05$), which had a small positive effect on the count.

Figure 6.1 Average Daily Dragon Sightings Each Month at Banu Nggulung, Komodo Island, April 1990 - August 1996.



Analysis of the 'after provisioning ceased' subset revealed two variables to contribute significantly to the fit of the model; the monthly trend variable and one seasonal dummy. R for regression was significantly different from zero ($F(2,17)=129.03$, $p < 0.0001$), and an R^2 value of 0.938 indicated a near perfect fit to the data. The first variable to enter the equation was the trend variable ($B = -0.48$, $p < 0.0001$), which had a negative effect on the count and corresponds to the temporal decay in the count (Fig.6.1). The second variable to enter the equation was the seasonal dummy for February ($B = -1.31$, $p < 0.05$), which also had a negative effect on the count. The entry of this second variable only slightly increased the fit of the model, improving the R^2 value from 0.921 to 0.938.

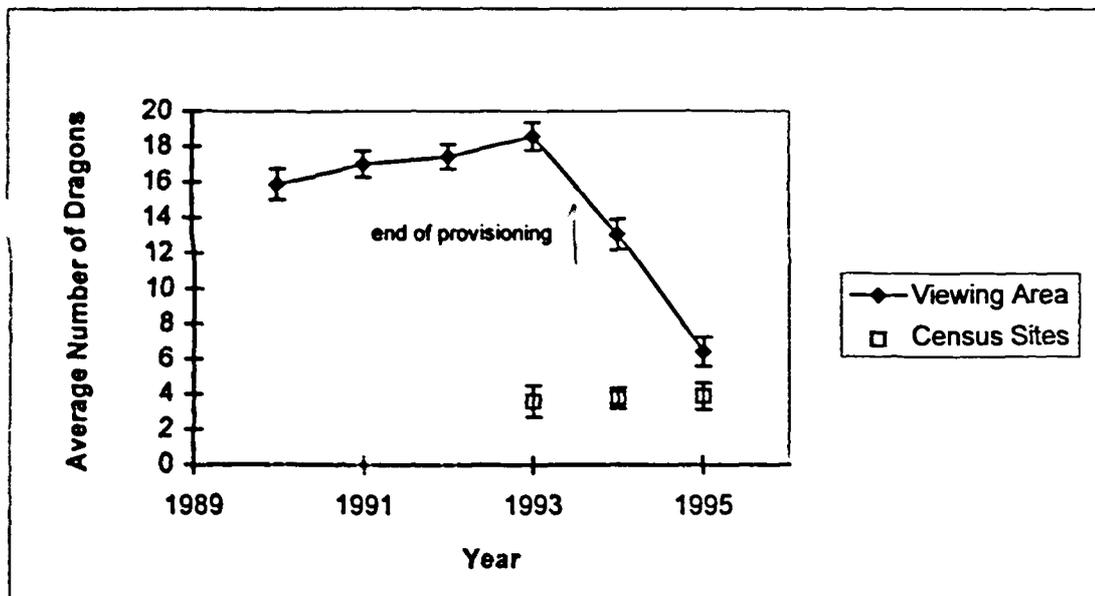
- **Comparison with Annual Census Data and Previous Studies**

Although not entirely comparable on methodological grounds, the average counts for the 47 sites of the annual census survey, carried out each October, are compared with the average

daily counts for October at Banu Nggulung, from 1990-1995 in Fig.6.2. Two patterns emerge from these data:

- In the years when provisioning occurred at Banu Nggulung, a significantly higher number of dragons were seen *at any one time* at Banu Nggulung than were seen *over 24 hours* at the annual October survey sites.
- Upon cessation of provisioning, the number of dragons seen at Banu Nggulung fell to within one standard deviation of the average count at the annual October survey sites.

Figure 6.2 Average Daily Dragon Counts at Banu Nggulung in October Compared With Average Census Site Counts in October, 1990 - 1995.



Auffenberg (1981) found that on average less than four individuals were seen together at a carcass, whilst over the period of a day a mean total of 7 dragons visited a carcass. The maximum number recorded visiting a carcass was 17 (Auffenberg, 1981). Clearly the regular observation of 15-20 dragons at the Banu Nggulung provisioning site *at any one time* during provisioning was considerably greater both than the densities observed before (Auffenberg, 1981), and after (Fig. 6.1) the period of provisioning.

6.3.2 General Ecological Impacts of Tourism

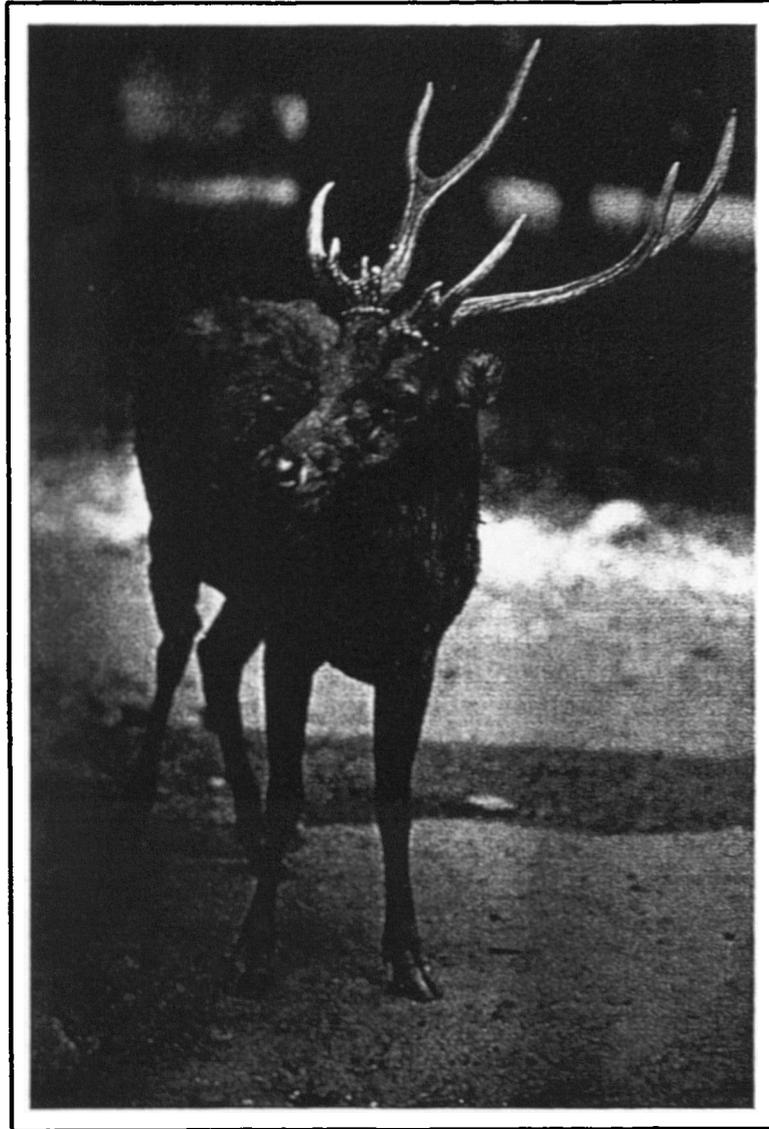
- **Disturbance and Habituation of Wildlife**

Disturbance of wildlife by visitors walking along trails is considered by KNP management to be insignificant in KNP. Deer, wild boar, and Komodo dragons are all seen close to the Banu Nggulung trail, and ground-dwelling Megapode birds have built mounds both in the Loh Liang camp and adjacent to the Banu Nggulung trail. On all but the busiest days, the trail is only used between 7-10am and between 4-6pm. If wildlife were assumed to be disturbed up to a distance of 100m to each side of the trail (an overcautious estimate), then a total of $<0.8\text{km}^2$ (80ha) of forest would be disturbed by visitors, twice a day. The area of monsoon forest is estimated to be 25% of the total area of Komodo Island (30,000ha), a total of 75km^2 (7,500ha). Thus only 1% of the monsoon forest, and virtually nowhere else on the island, is disturbed by visitors.

Habituation of wildlife has also occurred at the visitor camps on Komodo and Rinca. At the visitor camp at Loh Liang, both dragons and deer cohabit without fear or aggression towards people or each other. Three dragons come regularly to the camp from the forest nearby, and remain there often until after dark. They are extremely docile, showing no interest in their preferred prey species, nor in the many visitors who approach to within touching distance. They appear well fed from the cafeteria scraps, which is the likely cause of their presence despite suggestions by rangers that the camp is simply part of their territory in which they like to bask during the day. At both Loh Liang and Loh Buaya, a number of juvenile dragons are often seen looking for food. At present they are still quite timid, and run away from people. Habituation, dependency and aggression towards visitors may become a problem as they grow older. There are a number of deer which are also seen regularly in the camp (Fig.6.3). They too feed on the scraps from the cafeteria, as well as occasionally being hand fed by visitors and staff. They are very tame and show no fear of the dragons, although they remain alert to them and will capitulate to them at the cafeteria window. A number of the deer in the camp are in poor condition, limping with wounds and abscesses. It has been suggested by park rangers that they are seeking sanctuary in the camp, where the dragons are not interested in them and they do not risk being attacked (Alo Sahu, *pers.comm.*).

At the height of provisioning, a maximum of 28 dragons were seen at Banu Nggulung (see above). In addition, no more than six have ever been seen at Loh Liang. Given the nomadic nature of most adult dragons and the lack of data regarding group composition at these sites

Figure 6.3 Rusa Deer (*Cervus timorensis*) Occupy the Loh Liang Visitor Camp Scavenging Food from the Cafeteria.



it is difficult to estimate what proportion of the island population come into contact with visitors. However, the current group of 6-8 dragons which are seen at Banu Nggulung in the absence of provisioning, and which are thus assumed to be residents of the area, represent less than 1% of the estimated island population of 1687 individuals (TNK, 1996). Even in the presence of severe disturbance, tourism is unlikely to have significant impacts upon the dragon population as a whole.

- **Trail Degradation and Soil Erosion**

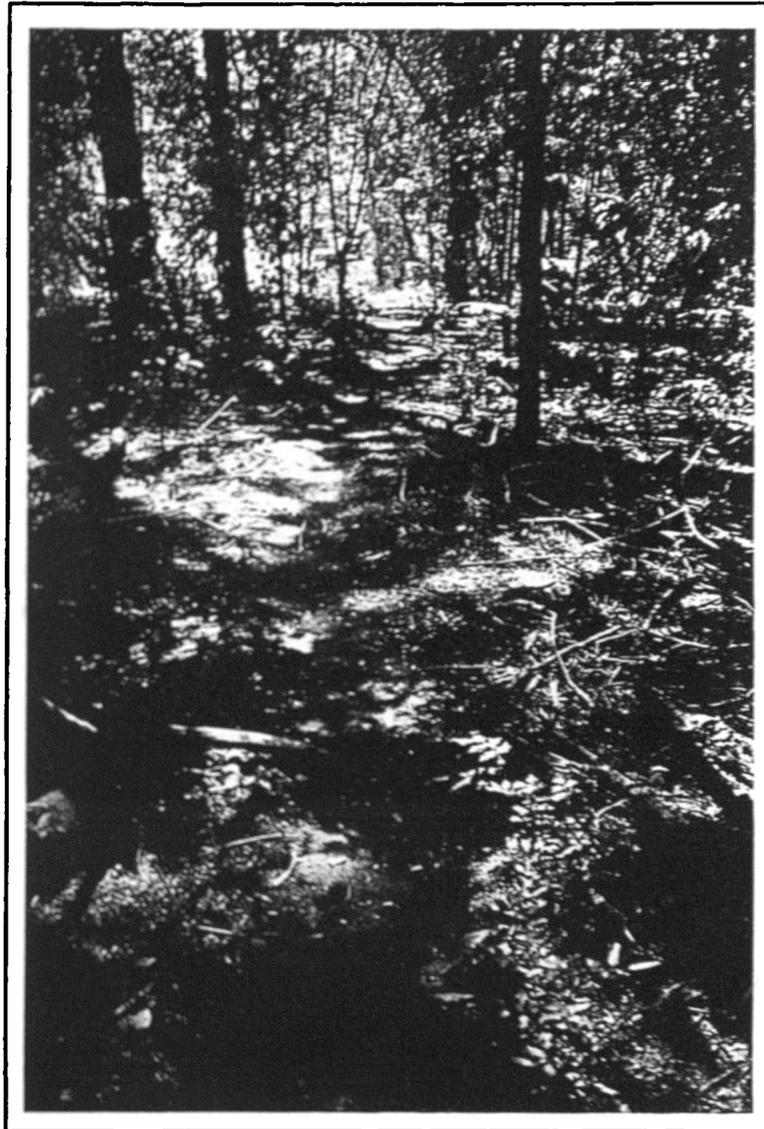
The limited network of paths, and the restriction of visitors to guided groups, confines soil damage to a very small area. Being a dry environment, the paths do not become muddy and rutted. Hence lateral spread of the paths caused by visitors avoiding muddy sections does not occur. The condition of paths in parks in wetter environments, such as Ujung Kulon in West Java, is greatly inferior to that of paths in KNP (Sudibyo, *pers.comm.*).

By far the greatest visitor pressure occurs on the trail to Banu Nggulung. Over 25,000 people walked along this trail in 1995/96. Despite this, it is in good condition (Fig.6.4). The trail is entirely flat, so erosion and gullying is not apparent. Where it does cross small channels, wooden bridges have been constructed, more for ease of passage than to prevent bank erosion. The trail is completely bare, and the dusty soil is hard and compact. The average width of the trail is 126cm (n = 39, s.d. = 51.15cm). However, forest clearings exhibit large areas of naturally parched, bare earth in several places along the trail, possibly due to the effects of Komodo dragons basking there (Alo Sahu, *pers.comm.*). This suggests that the current level of degradation on the trail is not unnatural for the environment in which it occurs.

The trail to Gunung Ara receives less than two percent of the number of visitors walking to Banu Nggulung in 1994/95, with an average of less than two groups (7 visitors) per week (Chapter 5). Consequently it appears rather overgrown and in places the trail is difficult to discern. At current visitor pressure, ecological impact along this trail is negligible. The same is also true of the other paths followed intermittently by visitors, such as that to Poreng.

The visitor trail on Rinca Island is the second most used trail in KNP after Banu Nggulung, receiving over 4000 visitors in 1995/96. It is very narrow and, where it passes through tall savanna grass, indistinguishable from its surroundings except for the presence of trail markers. The exceptions to this are on steeper slopes and bare hilltops. Where the trail

Figure 6.4 The Trail to Banu Nggulung Through Monsoon Forest Exhibits Minimal Signs of Degradation.



traverses a steep slope, it has become visibly eroded, forming a narrow gully roughly 30cms deep in the sandy soil. On downhill sections of the trail, it has widened considerably, due to visitors zigzagging in small traverses down the slope. This is particularly apparent where the grass is short and cover sparse, facilitating such trail spread. On exposed hill tops where the grass is short and cover sparse, paths tend to fragment and rejoin, creating lateral spread. These paths are also more apparent from a distance, creating an aesthetic scar on the landscape.

- **Habitat Change, Degradation and Tree Loss**

In KNP, the geographic spread of visitors is restricted. Much of the terrestrial part of the park is Sanctuary Zone and out of bounds to visitors (Fig.3.12). Most of the remainder is Wilderness Zone in which visitors are restricted to trails whilst accompanied by guides. The Intensive Use Zone, within which tourism development is permitted, is restricted to Loh Liang and Banu Nggulung on Komodo Island and Loh Buaya on Rinca Island. On Komodo Island, over 97% of visitors remain within the Intensive Use Zone (Section 6.3.4), which effectively covers less than 1% of the area of the island.

Maximum use occurs in confined areas within the monsoon forest. There has been no removal of trees within these areas associated with tourism, and habitat change along visitor trails is minimal. However, the pressure of large numbers of visitors could have an impact on the vegetation, altering the composition of the habitat over the long term. Tree regeneration in the Loh Liang visitor camp may be affected by the density of visitors concentrated in this area damaging seedlings and juveniles, such that recruitment will not advance at its natural rate. In addition to visitors, there is an unnatural density of deer within the camp that have become habituated to the presence of people (see above). Hoof pressure and browsing pressure may have an impact on forest regeneration although there are currently no data to support this.

The only place where visitors come close to mangrove forest is at Loh Buaya, on Rinca Island, between the pontoon and the visitor camp. A plan was submitted to route the visitor path through the mangrove to provide an interesting interpretive trail. However, the potential damage to this fragile habitat of a visitor trail was recognised before it was constructed, and the path now bypasses the mangrove.

- **Coral reef damage**

The shallow reef at Red Beach is being seriously damaged by the trampling of snorkellers. Visitors are ignorant of the damage they are causing due to the lack of a warning sign or any form of verbal instruction from their tour guides. In addition, there has been concern amongst park managers over the damage resulting from charter boats anchoring off Red Beach. This problem has been addressed by The Nature Conservancy (TNC), which has provided four permanent concrete moorings for charter boats to use when visiting the beach.

Marine recreation is most commonly undertaken by charter and some cruise passengers, although the recent introduction of snorkel and dive trips from Loh Liang has made this activity more accessible to ferry passengers also. In addition, there is considerable discussion of the possibility of developing the marine resources of the park for commercial dive tourism (Malik, 1996). These developments may have severe ecological impacts on a particularly fragile part of the KNP ecosystem.

- **Marine pollution**

The increased boat traffic in the waters of the park due to tourism will undoubtedly result in greater pollution. Fuel, sewage and litter are deposited into the sea, the latter washing up onto the shore as well as posing a threat to marine life. However, this problem is not confined to tour boats. Tourist traffic accounts for only a small proportion of the vessels using the waters of the park.

- **Fresh Water Consumption**

The presence of overnight visitors results in an increased consumption of fresh water. The park has a very dry ecosystem, with little surface water. Water for Loh Liang comes from a spring located at the head of a valley above Kampung Komodo. The pipe is a twelve year old extension to a pipe established in 1974 which supplies the village. Conflict with the village over the use of this resource results in almost daily interruptions to the Loh Liang supply. Currently the issue of freshwater consumption is a community relations problem rather than an ecological one, although there may be unforeseen ecological effects of increased freshwater consumption by visitors.

- **Litter**

In KNP, any combustible solid waste which is collected is burnt. Other rubbish is allegedly transported off the island. Litter bins are provided within the Loh Liang camp and along the

Banu Nggulung trail. However, the presence of bins merely encourages visitors to leave litter. Without regular removal, it quickly spreads. In addition, both deer and juvenile dragons were observed scavenging from the bins.

6.3.3 Ecological Impacts in Context: Other Problems

- **Poaching and Feral Dogs**

The proposed management plan for the park (Blower *et al.*, 1977) recognised that dogs are one of the most serious threats to Komodo dragons and should be prohibited. During 1994/95 there were 4 poaching incidents in the Park (Kodhyat, *pers. comm.*). Poachers come to hunt the deer with rifles and hunting dogs, some of which remain on the Islands and become wild, presenting a threat to the Komodo dragon. However, Komodo dragons themselves are not hunted. The impact of hunting and feral dogs on the prey species of the dragons, such as the deer and wild pigs, presents difficulties for the rangers who are ill-equipped to deal with armed poachers, and are often outnumbered.

- **Wild Fire and Deliberate Burning**

There were four fires in the park during 1994/95 (Kodhyat, *pers.comm.*). The dry savanna environment is susceptible to natural or accidental burning, and is also deliberately burnt to flush out deer by poachers. Fire quickly spreads out of control and can sweep over an entire island in a very short space of time. Between 1990 and 1992, the extent of fire damage increased from 9.09km² (909ha) to 45.56km² (4,556ha) (Lilley, 1995). Despite being somewhat fire-adapted, the vegetation of KNP may not be able to withstand such an increased frequency of man-made fires. Again, the rangers are unable to deal with such an eventuality.

The consequences of a large grass fire are evident from the recent history of Padar Island. Although some of the dragons were able to escape, the deer on the island were wiped out, either by fire or increased predation due to a lack of cover. However, with a lack of prey items the dragons also died out on Padar (Lilley, 1995).

- **Overfishing and Coral Blasting**

The marine environment attracts many fishermen, from as far away as Lombok as well as from the villages within KNP. Fishing for squid at night using pressure lamps forms the mainstay of the income of the villagers of KNP, but there is no quota based on sustainable utilisation.

Coral bombing incidents recorded by the KNP staff rose from 65 in 1991 to 121 in 1992 (Lilley, 1995). In 1994/95 there were 101 incidents, and one guard was shot (Kodhyat, *pers comm.*). This is an extremely destructive practice, causing massive reef damage and killing a great deal of marine life. It is estimated that coral bombers can make up to Rp1 million (US\$450) from the catch after a night's activity. Fishermen have also been caught using potassium cyanide to catch fish.

6.3.4 Monitoring and Management of Tourism

- **Current Monitoring Procedures**

At present, visitor statistics and data on visitor use patterns are collected meticulously. This task is made easier because all visitors must pass through the main office to sign in, all groups are accompanied by a guide and all activities and facilities must be paid for. Hence, information can be gathered consistently at each of these contact points. The following data are particularly important for visitor impact management;

- Group Size
- Spatial -temporal distribution
- Length of stay

In addition to this, a questionnaire constructed by the US Forest Service for KNP was administered by the Loh Liang main office in 1994. This was supplied to every tenth visitor for completion, and dealt with visitor satisfaction under a number of categories. The results were intended to be compiled and analysed using a specially written computer program at the park office in Labuhan Bajo. However, very few of these questionnaires were ever completed and distribution has since ceased.

Although visitation data is compiled and statistical reports written, little practical use is made of the information which these monitoring procedures supply.

No significant biophysical impact monitoring is undertaken. The dragon population is censused each year using observational counts at a series of bait sites on both Komodo and Rinca, as described above. In addition, guides report the number of dragons sighted at Banu

Nggulung at each visit. To date these data have not been analysed, other than to compile monthly reports for the park headquarters.

- **Controlling Visitor Use**

Visitor control is practised once visitors arrive on the islands, although there are no limits set on the number of arrivals to the park. In terms of limiting use, a number of controls are in place.

- **Zoning.** The park is divided into three categories defining the level of permissible use; Intensive Use Zone, Wilderness Zone and Sanctuary Zone (Fig.3.12). Tourism development and visitor access are confined to the areas designated as Intensive Use Zones (Loh Liang, Banu Nggulung, Loh Buaya). This zoning applies to other forms of utilisation besides tourism, but in practice it is unenforceable for anything other than tourism and exists only on paper in the management plan.
- **Designated trails, camps and viewing sites.** This further confines and controls the geographical extent of visitor impact.
- **Group size limits.** A nominal upper limit of thirty visitors per group is supposedly enforced for the Banu Nggulung trail, the only one that receives such a volume of visitors. This limit is waived for cruise ship groups, although large groups are divided into groups of around thirty.
- **Group departure intervals.** In most instances an interval of at least thirty minutes is enforced between one group and the next starting the Banu Nggulung trail. This is in an effort to control crowding at the viewing site. In practice this is usually only necessary during the busy early morning period or when very large cruise ship groups arrive.
- **Length of stay limits.** Although there is no limit on the length of stay of a visitor on the islands, guides try to limit the duration of walks to Banu Nggulung to around 90 minutes. This is in an effort to reduce overcrowding at the viewing site and on the trail.

- **Ameliorating Impacts**

Besides controlling the geographical extent of visitor use (e.g., through the provision of designated trails), facilities have been constructed to lessen the impacts of visitor use, namely the provision of two small bridges on the Banu Nggulung trail over narrow stream channels. Although actually constructed for ease and safety on the trail (Alo Sahu, *pers.comm.*), they do serve to reduce bank erosion. The construction of concrete mooring buoys to limit anchor damage to coral are another ameliorative measure.

Visitor awareness is another means by which negative visitor impacts can be reduced. Initiatives employed at KNP are limited, but do include wooden signs advising visitors how to behave towards the environment (Fig.6.5), and a rudimentary introductory talk before the walk to Banu Nggulung.

- **Limits of Acceptable Change**

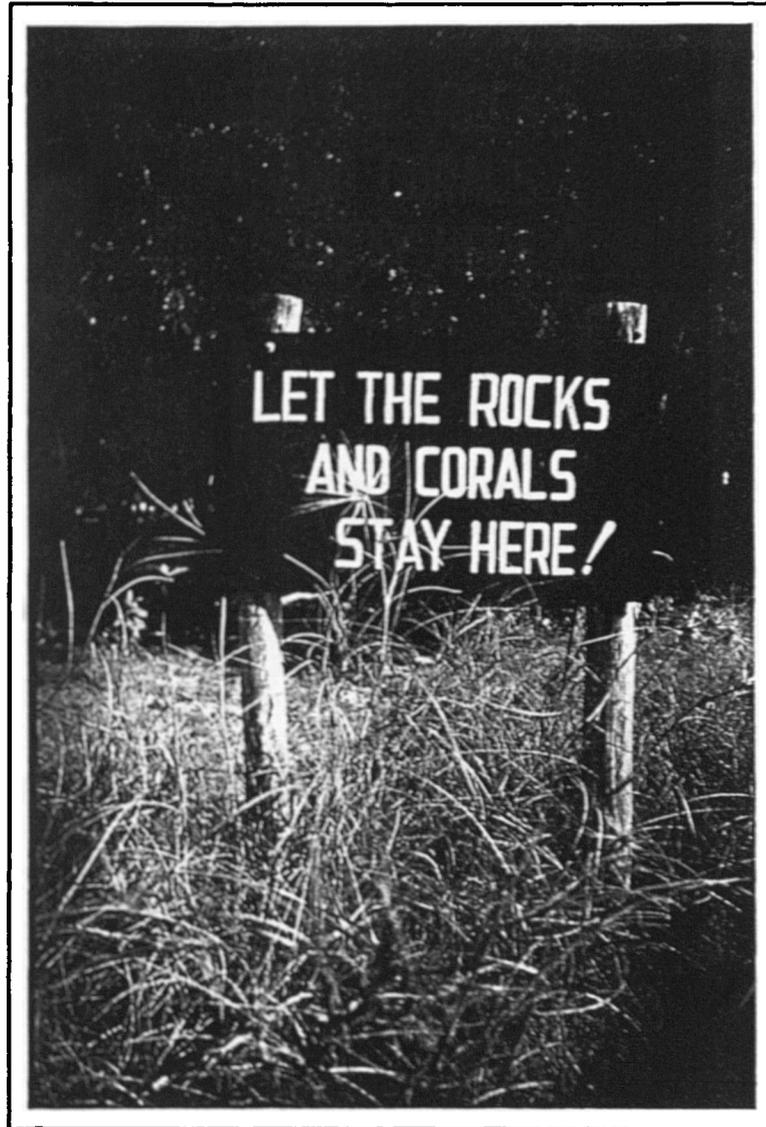
No limits of acceptable ecological change have been established and adhered to in KNP. However, management is adaptive to perceived change; it was decided that the dragons at Banu Nggulung were becoming too dependent on provisioning, and so this practice was stopped.

6.4 Discussion

6.4.1 The Effects of Provisioning on Local Dragon Density

These results suggest that an artificially inflated number of dragons were resident in the area of the viewing site as a result of provisioning of goats for tourists. This indicates that individuals had become habituated to the presence of regular bait at the site. Individuals scavenge over wide areas and can travel up to 8km to carrion. Furthermore, their foraging patterns lead them to return to specific sites that can be expected to produce food (Auffenberg, 1981). It is likely that individuals from a wide area converged on the Banu Nggulung site and remained in the vicinity when provisioned food was readily available. Given that most adults are transient nomads rather than habitual residents, the provisioning

Figure 6.5 A Notice in KNP Reminding Visitors to Behave Responsibly Towards the Environment.



may have significantly altered the dispersal pattern of individuals, and thus their interactions with other individuals and their habitat.

The presence of regular bait and resultant increased density of dragons may have affected breeding patterns, given the relationship between carrion sites and courtship/mating highlighted by Auffenberg (1981). Whilst courtship and mating occurred at carrion sites with a few additional individuals present (Auffenberg, 1981), it is likely that the aggression and hierarchical effects associated with carrion sites would interfere with breeding at higher densities. Therefore it is likely that only the larger, dominant males would be able to breed, and subordinate individuals may either disperse in search of other mates or be chased away during the breeding season. This may explain the marked trough in counts during July, the principal breeding period (Auffenberg, 1981).

No data are available on the additional effects of habituation, namely increased intraspecific aggression and nutritional dependency on bait, on the dragons at Banu Nggulung. However, adult dragons are cannibalistic on smaller size classes, and the most effective intrinsic mechanism for dispersion within equal size classes is aggression (Auffenberg, 1981). Therefore it seems likely that increased aggression would have been evident and may have resulted in increased mortality or decreased fitness of individuals. An additional health factor of concern to the park staff was the risk of spinal damage to individuals straining upwards to feed on the goats, which were suspended from the branch of a tree.

Upon cessation of the provisioning in August 1994, the number of dragons regularly seen at the site began to decline. Thus individuals had not become so dependent upon provisioning that they were unable to resume natural foraging behaviour. The habituation to provisioning appears to have been a temporary phenomenon. However, two individuals which remained at the site were observed to become emaciated and to subsequently die after the cessation of provisioning. Whilst this may have been age or disease-related, it could also have been a result of irreversible habituation to provisioning.

6.4.2 General Ecological Impacts of Tourism

At present, tourism does not appear to have serious ecological impacts in KNP. It is confined geographically, and is essentially non-extractive and non-consumptive. Disturbance of wildlife is minimal, and the effects are more likely to affect tourism safety and enjoyment

rather than the survival and well-being of the wildlife as a whole. Among the park staff questioned, there was a general feeling that tourism was not causing any major ecological problems. It was felt that recognised problems (dragon habituation to provisioning, anchor damage to coral) had been addressed. This is not to suggest that there are not ecological concerns associated with tourism in KNP, particularly in the long term. However, at the present level it does not appear to be having a dramatic negative effect on the conservation of the wildlife and habitats of the park.

Table 6.1 Ecological Impacts Attributed to the Type of Visitor Most Responsible¹

Type of Impact	Overnight Visitors (principally ferry passengers)	Day Visitors (cruise ship and charter passengers)
Litter	*	
Marine pollution		*
Freshwater consumption	*	
Habitat change in Loh Liang	*	
Widespread trail pressure	*	
Concentrated trail pressure		*
Wildlife disturbance		*
Coral damage		*

If different visitor types are considered separately, some differences in type of impact become apparent (Table 6.1). Overnight visitors (principally independent ferry passengers) are likely to produce more litter and waste and consume more freshwater. They will have greater impacts within visitor camps, but will also have a more widespread distribution of impacts on Komodo island given that they are the only visitors to use trails other than that to Banu Nggulung. Day visitors to Komodo (principally cruise ship passengers and charter passengers) are likely to create more disturbance, because of their greater volume and group sizes, but in a more confined area. They are also responsible for the majority of coral damage and marine pollution. Since charter passengers are the only ones to visit Rinca they are responsible for all the impacts on that island.

¹ categories of impact are not exclusive to the type of visitor indicated. Asterisks indicate the type of visitor most likely to cause each type of damage.

Whether acute impacts in a confined area are preferable to diffuse impacts over a wider area depends on the nature of the environment and the priorities of management. If wildlife is easily disturbed or the habitat fragile, or if the tourism objective is to provide a quick spectacle for large numbers of visitors, then development in an intensive 'sacrifice' area may be preferable. However, if the intention is to provide a wilderness experience, and the environment is robust to low intensity impacts, a more widespread distribution may be favoured. The mixed approach has been taken to date in KNP, although the former approach prevails.

6.4.3 Ecological Impacts in Context: Other Problems

It is clear that there are other ecological concerns that are a greater threat to the park than tourism, including poaching, coral blasting and fire. Limited resources prevent staff from responding rapidly to every threat encountered. In this respect, tourism may hamper protection in the park by monopolising the human resources of the park which could otherwise be used for increased vigilance and patrol effort.

Marine impacts associated with the fishing industry are the main threat to the biodiversity of the park. These are currently being addressed by the work of TNC in conjunction with the park authorities. Sustainable fishing practices have been identified and an effort is being made to implement them (Pet and Djohani, 1996).

6.4.4 Monitoring and Management of Tourism

Management based on LAC/LAU requires monitoring procedures to ensure that the system remains within the set boundaries and to detect when it does not. However, it is clear that, other than the rudimentary dragon monitoring described above, no forms of environmental monitoring are practised, and so management relies on the observations of field staff to detect when action is necessary to halt environmental change. In this respect it is not dissimilar from the majority of parks in developing countries (Giongo *et al.*, 1993).

Currently, tourism management proceeds at an operational level but is rarely proactive. However, tourism is growing beyond the capacity of current infrastructure, and beyond the forecasts of a twenty year-old management plan upon which current management is based. The monitoring of tourist impacts is vital for adaptive management, but is not carried out.

This may in part be due to the perception that tourism is not causing serious impacts, but is principally due to a lack of skills and resources and the prioritisation of other issues above tourism impacts (Subijanto, *pers.comm.*). The limitations of management and monitoring are recognised by park managers. A new management plan, and increased interface with partner organisations such as NGOs are amongst the latest initiatives to improve the situation. These issues are discussed further in Chapter 10.

7. TOURISM AND PARK FINANCES

7.1 Introduction

The second assumption of ecotourism is that it is of net benefit to conservation (Chapter 1). Protected areas are coming under increasing pressure to justify their existence in economic terms, and tourism is the principal means by which revenue can be generated (Hales, 1989; Zube and Busch, 1990; Wells, 1992; Wells and Brandon, 1993). A number of studies have compared tourism revenues with park management costs (Movcan, 1982; Dixon *et al.*, 1993; Wells, 1993; Driml, 1994), and it is clear that, whilst substantial revenues may be generated, many protected areas do not recoup their management costs (Chapter 2). Even where revenues have been compared with estimated tourism costs alone, protected areas may experience a net deficit (Lindberg and Enriquez, 1994).

The efficiency of the market in capturing the economic benefits of tourism will affect the net value of tourism to protected areas (Dixon and Sherman, 1990; Dixon and Sherman, 1991). However, protected areas have traditionally been viewed as merit goods. In most cases, pricing policy dictates that only token fees be charged for entry, to allow access to all members of society. As such the majority of the economic benefit of protected areas remains uncaptured. In an attempt to include uncaptured benefits in economic cost-benefit analyses of protected areas, several studies have used contingent valuation (CVM) and travel cost (TCM) methodologies to measure the surplus economic benefit which both users and non-users derive (Brown and Henry, 1989; Tobias and Mendelsohn, 1991; Dixon *et al.*, 1993; Maille and Mendelsohn, 1993; Moran, 1994). Whilst there is some controversy regarding the use of these techniques to value protected areas and wildlife (see Chapter 2), an estimation of visitors willingness to pay for entry to protected areas, using CVM, may yield useful practical information to assist park managers in establishing appropriate pricing policies.

Pricing policy is one of numerous factors which will affect the contribution of tourism to protected areas (Lindberg and Enriquez, 1994). Equally significant is visitor satisfaction. Understanding visitor perceptions, and adapting to them, is important if a destination is to remain competitive, since personal recommendations account for over 50% of all tourism (Nizette, *pers.comm.*). In the independent 'alternative' travel market, which encompasses remote and developing locations, peer perceptions (and those presented in guide books) are

particularly important in spreading information and opinion about a destination amongst the traveller network. For increased benefits to be realised, visitor needs must be addressed.

KNP does not have an explicit financial objective with regard to tourism. The current entrance fee is nominal to allow access to domestic as well as foreign visitors.¹ Moreover, revenue from additional visitor services offered within KNP (guiding, accommodation) do not accrue to the park (Chapter 3). It is therefore likely that considerably more revenue could be generated for the park than is currently the case. This chapter analyses the financial contribution of tourism to KNP, and examines ways in which the net financial contribution of tourism could be increased. It also considers the current expenditure, and willingness to pay increased fees, of different types of visitors using the typology developed in Chapter 5. The attitudes of visitors towards current and future development, and potential price rises, are also investigated. The following questions are addressed:

- What is the net financial contribution of tourism in KNP?
- What additional visitor expenditure occurs within KNP?
- What is the breakdown of visitor expenditure by visitor type?
- How much additional entrance fee are visitors willing to pay?
- What factors affect willingness-to-pay?
- What are the attitudes of visitors towards KNP as a tourist attraction?

After a presentation of methods (Section 7.2), the results of the chapter are divided into three sections. Firstly, the revenues from tourism to KNP are compared with the total park budget, and with the financial costs of managing tourism in the park (Sections 7.3). This section also examines other forms of tourism spending within the park which do not accrue to the park authorities. It also estimates the breakdown of tourist spending within the park by visitor type. In Section 7.4, the potential for increasing the financial contribution of tourism to the park is examined using CVM. Factors affecting visitor willingness-to-pay are also identified. Section 7.5 examines visitor attitudes, both prompted and unprompted, towards the tourism experience in the park. The chapter ends with a discussion of the results (Section 7.6).

¹ although this appears to be in the process of changing, and a considerable rise in the entrance fee for KNP is anticipated (Subijanto, Tatang, pers.comm.).

7.2 Methods

7.2.1 KNP Expenditure and Revenue

Two different comparisons have been made between revenue from tourism and the costs of park management, reflecting different perspectives on the role of tourism in the financing of protected areas (Lindberg and Enriquez, 1994; Laarman and Gregersen, 1996). The first perspective maintains that protected areas should be self-financing, and that tourism should pay for the costs of maintaining the resource upon which it is based. In this case the comparison is made between entrance fee revenues and the total budget for the park. The second perspective maintains that tourism should at least pay for itself in protected areas, even if it doesn't contribute to other management costs. In this case a comparison is made between entrance fee revenues and estimated costs of tourism in the park.

Data on the total annual KNP budget, divided between one Routine and two Capital budgets (Chapter 3), from 1990/91 - 1994/95, were available from KNP accounts. Separating the financial costs of tourism from total park costs is problematic, even with detailed park accounts (Lindberg and Enriquez, 1994). However, it can be assumed that tourism expenditure will only occur from the Routine budget in KNP, since the Capital budgets relate to protection and capacity building. Of the components of the Routine budget, the simplest to calculate in terms of tourism-related expenditure was salaries. Interviews with KNP staff were used to identify which staff members were dedicated to tourism duties. Salary data from KNP accounts was then used to estimate the proportion of salaries consumed by tourism-related staff. Total tourism-related costs were estimated by extrapolation to the total Routine budget (Section 7.3.2).

Two sources of data regarding entrance fee revenue exist. Compiled annual data for KNP as a whole were available from KNP records. Raw monthly data were available directly from the visitor books on each island. Equivalent data from these two sources are not identical, therefore both data sets have been used separately (Section 7.3.3). Data regarding revenues from guiding and accommodation are available from the same sources as for entrance fee revenue, with the same caveats regarding data accuracy (Section 7.3.4).

Expenditure by different types of visitors on guiding and accommodation is related to length of stay, since each guided walk is paid for individually, and accommodation is charged for on

a nightly basis. Therefore, the average length of stay of each type of visitor (Table 5.9), was used to estimate average expenditure (Section 7.3.5).

Where conversions to US\$ have been made, the annual end-of-period exchange rates published by the IMF are used. Annual totals have been adjusted to a 1995/96 US\$ equivalent to take account of inflation, using IMF real effective exchange rate indices based on relative wholesale prices. The 1995 end-of-period exchange rate was US\$1=Rp2,308 (IMF, 1997).

7.2.2 Willingness to Pay Increased Entrance Fees

CVM attempts to estimate user surplus by asking a sample of respondents to state their willingness to pay to prevent (WTP), or willingness to accept compensation for (WTA), a specified change in an environmental asset, and extrapolating the results to the population as a whole. The valuation is contingent upon the specified change in quality of the asset (Mitchell and Carson, 1989; IIED, 1994a; Jakobsson and Dragun, 1996). This study has not attempted to calculate user surplus *per se.*, since the figure itself is of little practical use (Chapter 2). Rather, an adapted version of CVM has been used to measure that part of user surplus which could be captured via increased entrance fees.

A survey was conducted amongst KNP visitors at the cafeteria in the visitor camp on Komodo island. Questionnaires for self-administration were handed out randomly to visitors by a KNP member of staff. A total of 524 responses were collected, between August and November 1995. The survey employed an upper and lower-bounded dichotomous choice form of question, with entrance fee as the specified payment instrument. Rather than elicit WTP contingent upon a change in quality in the park, the survey asked respondents their WTP for *access* to the park without any change in quality. Three variations of the questionnaire, with different levels of starting bid, were distributed randomly amongst the sample. Starting bids were US\$4, US\$8 and US\$16, with follow-up bids of half and double the starting bid, ranging from US\$2 - US\$32.

There are a number of limitations to CVM, principally the assumptions that respondents know the surplus they derive from an environmental asset and that they will reveal this surplus truthfully (Jakobsson and Dragun, 1996). Revealed preferences will be affected by aspects of survey design (design biases), cognitive function (strategic bias) and by hypothetical bias (hypothetical questions yield hypothetical answers). However, many of

these can be minimised by sensitive survey design (Hoevenagel, 1990). A number of tests of validity can also be carried out (see below, and Section 7.4.1).

- **Minimising Bias**

The design of the method has been chosen to simulate as closely as possible a real market situation, and therefore minimises hypothetical bias. Firstly, in a scenario such as this with an existing payment mechanism, WTP is preferable to WTA. Secondly, discrete choice questions are more realistic than open-ended continuous ones, since they more closely simulate a take-it-or-leave-it market situation. Thirdly, the use of a familiar payment mechanism (entrance fee) also enhances the approximation to reality in the constructed market scenario. Finally, the use of access as the contingent factor, rather than a more abstract change in environmental quality, constructs a more realistic scenario which is easier for respondents to interpret.

The discrete choice method is relatively inefficient in comparison with a continuous question and requires a greater number of observations (Jakobsson and Dragun, 1996). However, by using a self-administered survey, many observations could be collected. In addition, by using a double-bounded discrete choice question, efficiency is increased (Hanemann *et al.*, 1991). Furthermore, any analytical benefits of continuous choice methods tend to be negated by the tendency for clustering of responses around round numbers (50, 100 etc., Jakobsson and Dragun, 1996).

- **Tests of Validity**

Although the discrete choice method is more realistic, it risks not capturing the full range of WTP responses. It has been suggested that if less than 10% of the sample answer 'yes' to the highest bid amount then the bid vector has captured the range of WTP well (Boman and Bostedt, 1995). The extent to which the full range of WTP is captured is simple to assess by examination of the data (Section 7.4.1).

A further problem with discrete choice methods is starting point bias, the effect of the choice of initial bid amount presented to respondents, on WTP. This has been tested by examining the differences in the proportion of respondents willing to pay a particular bid amount between questions with different initial bids.

The comparatively realistic nature of the hypothetical market constructed in this study increases the risk of strategic bias, whereby stated WTP is compromised by unrevealed motivations of respondents. Although rarely found empirically (Jakobsson and Dragun, 1996), strategic bias could be a problem if respondents perceive that their answers will influence park pricing policy. In the event, many respondents qualified their answers with respect to park policy, allowing this issue to be examined further (see Section 7.5).

Due to practical limitations, the sample was limited to those visitors who frequented the cafeteria on Komodo Island, who were essentially independent tourists. Package charter tourists were underrepresented in the survey (hereafter termed the independent visitor survey), and cruise passengers were not represented at all. Hence extrapolation of WTP results to the whole population is problematic. However, since these individuals do not pay their own entrance fee (it is included in the price of the package), they are unlikely to know the current entrance fee value. As such it would have been invalid to examine their responses to hypothetical fee rises without reference to the impact of fee rises on their tour price. As a test of this assumption, both the independent visitor survey and a pilot survey of a small sample of package tourists asked respondents what they thought the current entrance fee to KNP to be.

An attempt was made to measure package tourist WTP by surveying two small samples of tour operators. Firstly, ten Indonesian operators were asked how much they thought the entrance fee should be, and also how a Rp10,000 (approx. US\$4.50) fee would affect their business. Secondly, in a postal questionnaire by Metcalfe (1996), twenty-two German operators were asked how much entrance fee they would be prepared to pay for their clients to enter KNP. Three categories of fee were suggested; DM4, DM20 and DM40 (Metcalfe, 1996). Responses were analysed as part of this study and compared with those from the independent visitor survey.

- **Analysis**

There are three sections to the analysis of the survey results. Firstly, a hypothetical demand curve was constructed, based upon willingness to pay at the five bid amounts (Section 7.4.2). A regression model was fitted to the curve using a negative exponential function, the equation for which is

$$q = q_0 e^{-kp}$$

where

p = the entrance fee,

q = the percentage of the sample willing to pay p ,

and q_0 and k are constants.

This can be transformed into the straight line function

$$\ln q = -kp + c$$

where $c = \ln q_0$

This equation was used to calculate the price elasticity of demand; since

$$\text{elasticity} = d(\ln q)/d(\ln p)$$

this mathematical relationship implies that the price elasticity is simply $-kp$. It was also used to calculate the fee at which the maximum revenue is generated, and to calculate the mean and median WTP. Measures of central tendency of WTP are often calculated in order to estimate total consumer surplus (e.g. Moran, 1994; Jakobsson and Dragun, 1996). This was not an aim of this study (see above). However, measures of central tendency are useful indicators of overall market failure, and so are included in this analysis. The median is defined as the value of p at which $q = 50\%$. The mean is calculated by integrating the demand function truncated between the bid limits of the survey (Jakobsson and Dragun, 1996).

Secondly, the results of the tour operator surveys were examined (Section 7.4.3). The demand curve derived from the independent tourist survey was compared with that derived from the survey of tour German operators, in order to identify differences in WTP between tourist types.

Thirdly, the independent visitor survey data was analysed to identify other respondent factors affecting WTP (Section 7.4.4). Bivariate analyses were used to compare WTP with other respondent attributes. The five willingness to pay bids were each individually compared with seven other categorical variables using Pearson's Chi-Squared test of significance. They were also compared with eight continuous variables using 1-Way ANOVA. Variables included socio-economic characteristics, self-ascribed motivational categories, length of stay in KNP and Indonesia, expenditure on visit to KNP and Indonesia, and variables for the number of dragons seen in different locations on Komodo Island.

Multivariate analysis was also performed using logistic regression. This is appropriate for data sets with a binary dependent variable and one or more continuous independent variables (Freeman, 1987). The analysis and interpretation of the results of logistic regression are similar to that of multiple regression except that the parameters of the model are interpreted in terms of their effect on the log odds of getting a 'y = 1' result in the binary variable. As such it can be used to predict the 'yes' response in dichotomous WTP data (Jakobsson and Dragun, 1996).

The equation for the logistic model is

$$\log [P(y = 1)/P(y = 0)] = B_0 + B_1X_1 + B_2X_2 + \dots + B_iX_i$$

where X_1 X_i are explanatory variables and B_1 B_i are coefficients.

Forward stepwise logistic regression was used, with criteria for entry and exit specified as significance levels of 0.05 for the score statistic and 0.1 for the Wald statistic respectively. This is in accordance with the procedure for discrete choice WTP analysis laid out by Jakobsson and Dragun (1996). Data were screened for outliers and multicollinearity. No problems of covariance were identified, however a number of outliers were. Although there was no reason for deleting these outliers, separate analyses were run with and without both univariate and bivariate outliers. Deletion made little difference to the results of the analysis so outliers are included in all subsequent analyses.

The first exploratory analysis included 29 explanatory variables. However, due to missing data this reduced the effective sample size to 175, which was not large enough to support the number of variables included (ideally in logistic regression, $n > 10(S + 1)$ where S = number of

explanatory variables, Freeman, 1987). In an effort to increase the sample size, subsequent analyses were performed with progressively fewer variables included. Each time the variable not included in the model with the highest score significance was removed.

7.2.3 Visitor Attitudes Towards Tourism in KNP

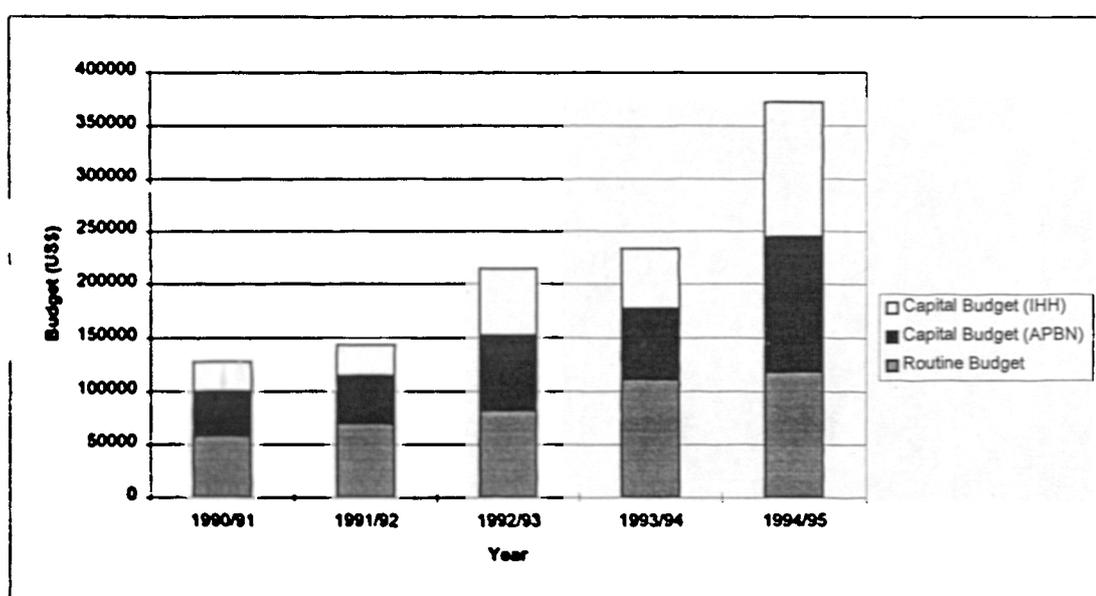
The questionnaire survey of independent visitors also explored respondent satisfaction, and the desirability of possible changes to the level of development and the tourist experience at KNP. Respondents were asked whether certain additional facilities within KNP would be desirable, and whether they would have stayed longer in KNP if such facilities had been available. They were also asked an open-ended question regarding additional facilities/services they would have liked at KNP. Numerous respondents added unprompted comments regarding their experience in KNP and their attitudes towards changes in pricing or development. Unprompted responses are often the most valuable source of data, since they reflect strong personal feelings which the respondent wishes to convey. In addition, a range of visitor attitudes were encountered during visits to KNP by the researcher. A synthesis of comments and attitudes is presented (Section 7.5).

7.3 KNP Expenditure and Revenue

7.3.1 Total Budget for KNP

The total annual budgets for KNP for the five years from 1990/91 - 1994/95 are given in Fig.7.1. There has been a large increase the total budget for KNP during this period. In 1994/95, the total budget was approximately US\$372,000, divided fairly evenly between the three operating budgets.

Figure 7.1 Total Annual Budgets for KNP Split Between Three Operating Budgets, 1990/91 - 1994/95.



7.3.2 Estimated Tourism-Related Costs

Of the 90 staff employed by the park, 21 are dedicated full time to tourism duties, principally at Loh Liang and Loh Buaya visitor camps (Muhidin, *pers.comm.*). The total of their salaries and benefits for April 1996 was US\$2,247, which is 20.7% of the total salary bill for that month. The other components of the Routine budget besides salaries (90.5%) are equipment (6%), maintenance (3%) and transport (1%), of which a proportion will be used in support of tourism staff. In the absence of more accurate information, it is assumed that the proportion of each of these budgets used in relation to tourism is equal to the proportion of the total salary budget used for tourism staff. Therefore, it is assumed that 20.7% of the total Routine budget is used for tourism-related purposes. Infrastructural and running costs for tourism facilities in the park are currently the responsibility of the Koperasi and are not paid for from

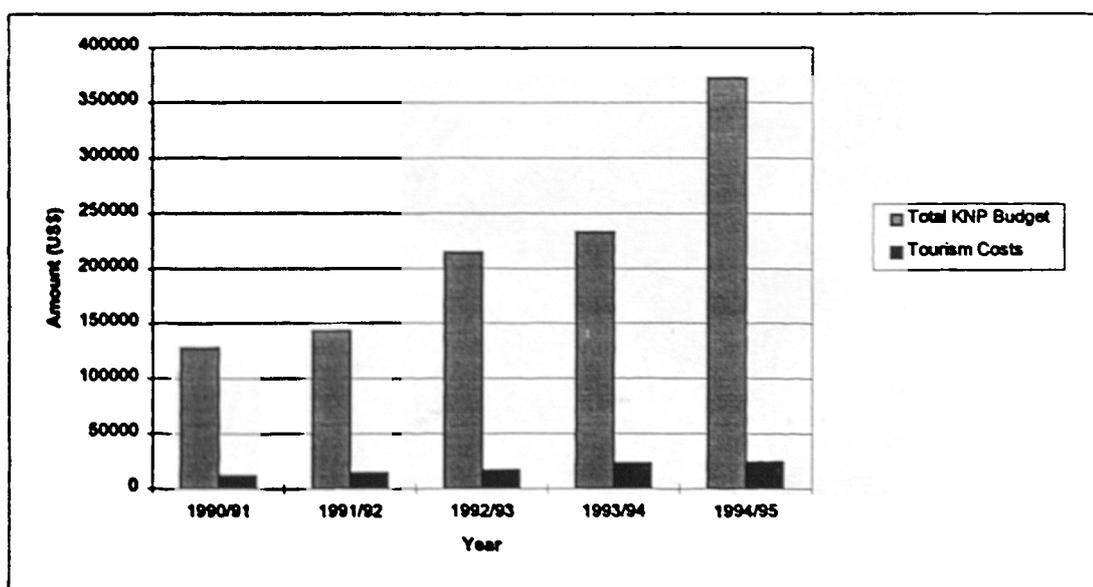
the park budget. Remedial costs are presumed to occur, in particular in relation to the trail and the Banu Nggulung feeding site. However, no information is available on any current expenditure in this respect above and beyond that included in the Routine budget.

The estimated annual tourism-related costs for KNP for 1990/91-1994/95, compared with the respective total annual budgets for KNP, are presented in Table 7.1 and Fig.7.2. Over the whole period, tourism-related costs comprise 8.36% of the total park budget.

Table 7.1 Estimated Tourism-related Costs as a Percentage of Total Park Budget, 1990/91 - 1994/95.

Year	Expenditure (US\$)	Estimated Tourism Expenditure (US\$)	% of Budget Spent on Tourism
1990/91	127,775	12,101	9.47
1991/92	143,282	14,506	10.12
1992/93	214,491	17,076	7.96
1993/94	233,407	23,078	9.89
1994/95	372,285	24,485	6.58
Total	1,091,240	91,245	8.36

Figure 7.2 Estimated Annual Tourism-related Costs Compared With Total Annual Budget of KNP, 1990/91 - 1994/95.



7.3.3 Revenue vs. Costs

Perspective (a): Revenue from Tourism Compared with Total Budget of KNP

Over the five years from April 1990, revenue from entrance fees amounted to only 6.9-7.0% of the total budget of KNP, depending which source of revenue data is used (Table 7.2). Over the whole five year period, each visit to KNP was subsidised by US\$10.75 - US\$10.82. If the latest year for which figures are available is examined (1994/95), the subsidy per visit is US\$13.40 - US\$13.53. These subsidies are paid for by central government and, ultimately, by domestic tax-payers.

Table 7.2 Revenue from Tourism and Total Budget of KNP Compared, Using Compiled Data and Raw Data.

Year	Total KNP Budget (US\$1000s)	Revenue from Tourism (US\$1000s)	Proportion of Budget (%)	Total Subsidy (US\$1000s)	Subsidy per visitor (US\$)
1990/91	127.8	7.3	5.7	120.5	8.74
1991/92	143.3	8.1-8.7	5.7-6.0	134.6-135.2	8.34-8.38
1992/93	214.5	9.4-10.0	4.4-4.6	204.5-205.1	12.15-12.18
1993/94	233.4	20.8-22.8	8.9-9.8	210.6-212.6	9.60-9.69
1994/95	372.3	23.4-26.7	6.3-7.2	345.6-348.8	13.40-13.53
Total	1091.2	75.3-69.0	6.9-7.0	1015.9-1022.2	10.75-10.82

Perspective (b): Revenue from Tourism Compared with Tourism-Related Costs

When the estimates of tourism-related costs are compared with entrance fee revenues, it appears that the park does not quite recover its costs for providing access to visitors. For the five year period from April 1990, a total of 75.7-82.6% of costs are recovered from entrance fee revenues, which suggests a subsidy of US\$0.17 - US\$0.24 per visit (Table 7.3). However, since the increase in entrance fee from Rp1000 to Rp2000 in 1993 (Chapter 3), a greater proportion of the estimated tourism-related costs have been recovered. In 1994/95, 95.8-109.1% of the estimated tourism-related costs were recovered.

Table 7.3 Revenue from Tourism and Estimated Tourism-related Costs Compared, Using Compiled Data and Raw Data.

Year	Estimated Tourism-related Costs (US\$1000s)	Revenue from Tourism (US\$1000s)	Proportion of Estimated Costs (%)	Total Subsidy (US\$1000s)	Subsidy per visitor (US\$)
1990/91	12.1	7.3	60.0	4.8	0.35
1991/92	14.5	8.1-8.7	55.8-59.7	5.8-6.4	0.36-0.40
1992/93	17.1	9.4-10.0	55.2-58.3	7.1-7.6	0.42-0.45
1993/94	23.1	20.8-22.8	90.1-98.6	0.3-2.3	0.01-0.10
1994/95	24.5	23.4-26.7	95.8-109.1	-2.2-1.0	-0.09-0.04
Total	91.2	75.3-69.0	75.7-82.6	15,900	0.17-0.24

7.3.4 Other Tourist Spending in the Park

In 1995/96, over US\$65,000 was spent by visitors in KNP (Table 7.4). Of this, only US\$25,000 was spent on entrance fees, whilst an additional US\$15,000 and US\$25,000 were spent on guide fees and accommodation fees respectively. Even without considering cafeteria purchases, the entrance fee accounts for only 37% of total visitor expenditure in the park. Therefore, considerably more expenditure occurs in KNP than accrues to government to offset costs.

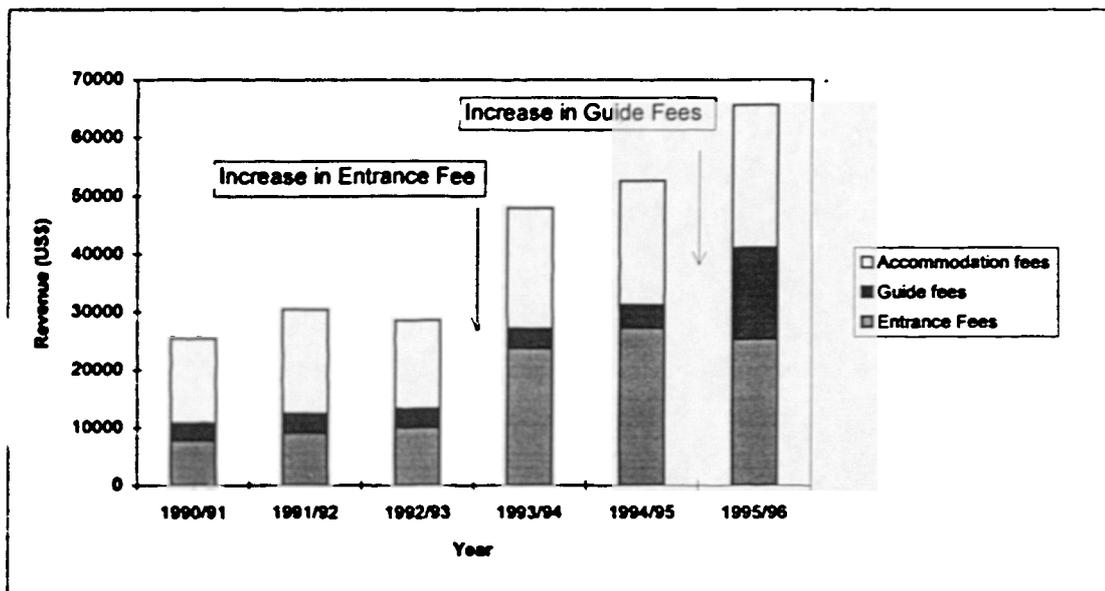
Table 7.4 Tourist Expenditure in KNP on Entrance Guide and Accommodation Fees, 1990/91 - 1994/95 (from Compiled Data) and 1995/96 (from Raw Data).²

Year	Entrance Fee Revenue (US\$)	Guiding Revenue (US\$)	Accommodation Revenue (US\$)	Total (US\$)
1990/91	7,266	3,130	14,596	24,992
1991/92	8,664	3,523	17,863	30,050
1992/93	9,950	3,387	15,131	28,468
1993/94	22,765	3,521	20,733	47,019
1994/95	26,701	3,970	21,366	52,037
1995/96	25,252	15,774	24,585	65,611

² There are some small differences between sources (Section 7.2.1) so these are not strictly comparable, however they do give an indication of the magnitude of change.

The annual totals for visitor expenditure in KNP reveal small increases until 1993/94 and larger increases from thereon (Fig.7.3). This is due in part to the more rapid growth of visitation in 1993/94 than in the previous two years (Chapter 5), but also to two significant price increases during that time (Chapter 3).

Figure 7.3 Tourist Expenditure in KNP on Entrance Fees, Guide Fees and Accommodation, 1990/91 - 1995/96.



7.3.5 Breakdown of Tourist Spending by Visitor Type

On average, a visitor to Komodo island spends US\$2.40 on services within the park (Table 7.5). Of this, US\$0.87 is entrance fee which accrues to the park, US\$1.01 is accommodation fee which accrues to the Koperasi, and US\$0.52 is guiding fee which is split between the Koperasi and the individual guides. However, there is some variation in average expenditure depending on the type of visitor. Since ferry passengers stay longer than other types of visitor, it follows that their expenditure in KNP is the highest, with an average of US\$6.00 per person. Local charter passengers spend on average between US\$1.72 and US\$2.11 in KNP, whilst Lombok charter passengers and those on cruise ships each spend approximately US\$1.35.

There is no difference in the amount of entrance fee paid by different types of visitor, since it is a standard one-off fee for all visitors, and not a daily rate (Table 7.5). Hence all visitors make an equal contribution to the park income, via entrance fees, regardless of their mode of

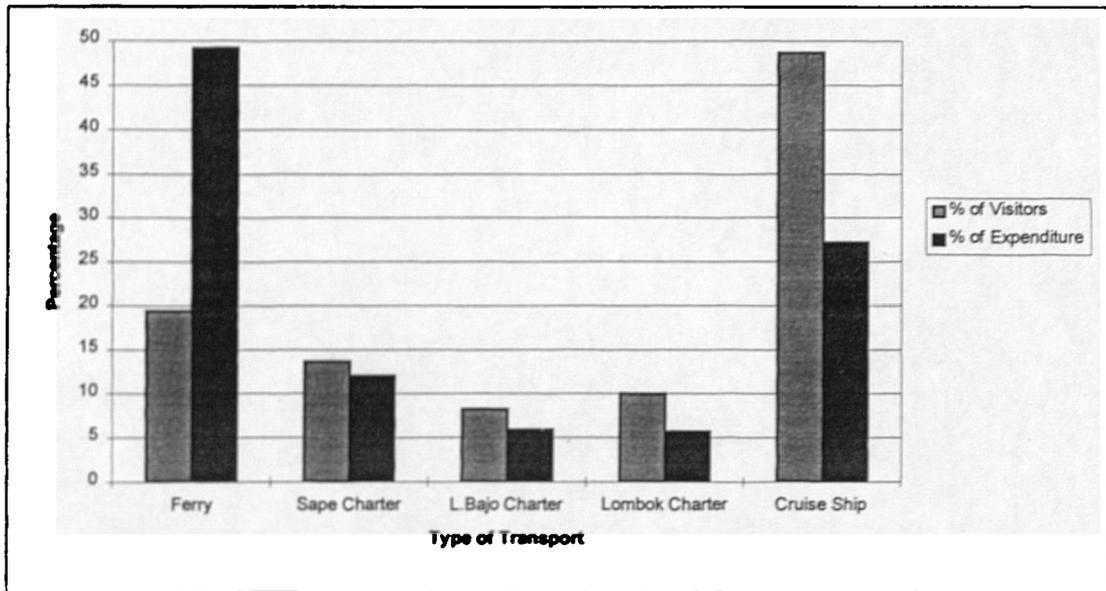
transport. There is also little variation by visitor type in expenditure on guiding, since very few visitors go on a walk other than that to Banu Nggulung, and only a few ferry passengers take this excursion more than once. Therefore there is only a US\$0.20 difference between the expenditure of ferry passengers and cruise passengers on guiding fees. The largest difference between visitors is in the average expenditure on overnight accommodation. Cruise ships provide accommodation on board, and hence no expenditure on accommodation within KNP is made. The local charters mostly include on-board accommodation, but a small number of visitors do use the park accommodation. The average expenditure by local charter tourists is US\$0.37-0.74. The ferry passengers are obliged to stay overnight, and are more likely to stay longer given that they are not confined by commercial tour schedules. Ferry passengers spend on average approximately US\$4.47 per person on overnight accommodation. Although figures are unavailable, it is likely that cafeteria purchases will reflect a similar distribution, since only overnight visitors require meals, and many cruise and package tourists are diverted away from the cafeteria area by their tour guides.

Overall, ferry passengers constitute <20% of visitors, but contribute almost 50% of visitor spending in the park (Fig.7.4). Conversely, cruise ship passengers which make up almost 50% of visitors only contribute a little over 25% of visitor expenditure. Charter tourists lie somewhere in between. Essentially, the most affluent tourists, those taking the most expensive excursions to KNP, contribute the least amount of visitor expenditure within KNP.

Table 7.5 Average Expenditure of Different Types of Visitor to Komodo Island on Entrance Fees, Guiding Fees and Revenue Fees, 1995/96.

Transport Type	Entrance Fees (US\$)	Guiding (US\$)	Accommodation (US\$)	Total Expenditure (US\$)
Ferry	0.87	0.67	4.47	6.00
Charter Sape	0.87	0.50	0.74	2.11
Charter L. Bajo	0.87	0.49	0.37	1.72
Charter Lombok	0.87	0.47	0.02	1.36
Cruise	0.87	0.47	0.00	1.34
Average	0.87	0.52	1.01	2.40

Figure 7.4 Proportion of Total Visitor Expenditure in KNP by Different Categories of Visitor, 1995/96.



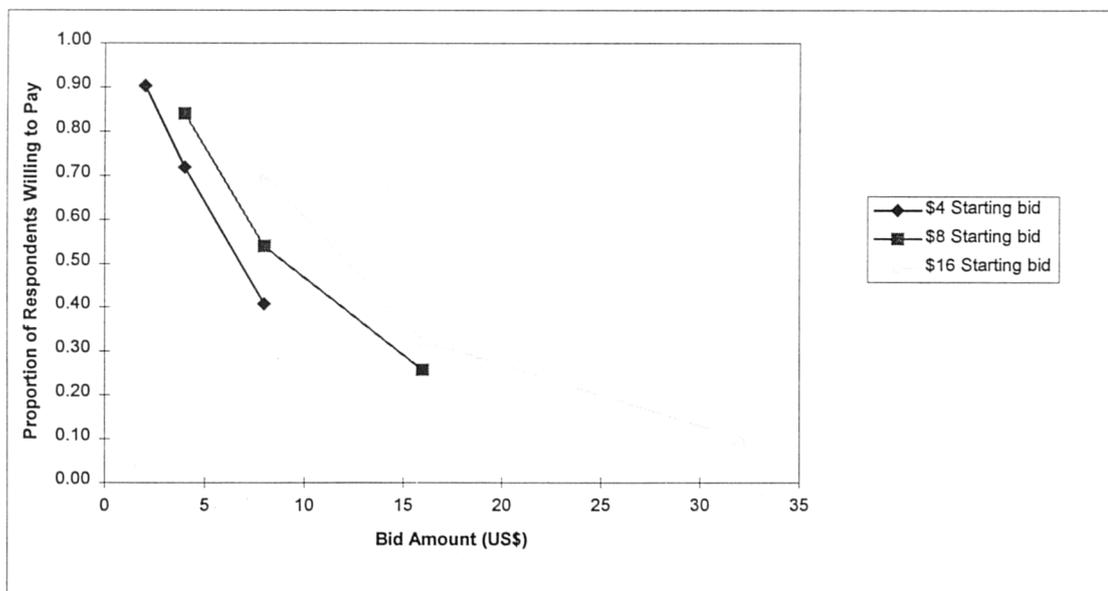
7.4 Willingness to Pay Increased Entrance Fees

7.4.1 Testing the Validity of the Method

10.29% of respondents were willing to pay US\$32 (Table 7.6). This suggests that most of the range of WTP has been captured.

Clearly, the position of a particular bid in the double-bounded dichotomous choice question affects proportional WTP (Fig.7.5). For example, when US\$8 is the starting bid, the proportion of respondents willing to pay US\$8 is less than when it is the lower second bid, and more than when this sum is the upper second bid. Chi-squared tests indicate that the differences are significant for US\$4 ($p < 0.01$) and US\$8 ($p < 0.0001$), but not for US\$16. These tests indicate that starting point bias is apparent, although the significance of this for the validity of the results is unclear. Given that the range of bid vectors adequately covers the sample WTP (see above), aggregating the results of the different questions is still considered to be a valid approach. Starting point bias is unlikely to severely compromise the results.

Figure 7.5 Proportional WTP of bid amounts on three different question formats.



The pilot survey of package tourists revealed an average estimate of current entrance fee to be US\$5.48 ($n = 23$, $s.d. = 4.81$), over five times the actual amount. Estimates ranged from \$0.50 to \$20, and many passengers admitted to not knowing the entrance fee at all. This

vindicates the exclusion of these visitors from the contingent valuation survey. Interestingly, an Indonesian tour manager who answered the question also incorrectly believed the entrance fee to be \$5. By contrast, 90% of respondents to the independent visitor questionnaire correctly believed the entrance fee to be between US\$0.50 and US\$2. The small number of respondents (2.2%) who guessed the fee to be greater than US\$5 were all found to be package tourists, and were excluded from further analysis.

Within the independent visitor population, there is no *a priori* reason to suspect that the sample is biased in any way. It could be argued that there will be a bias towards English-speaking visitors, but the nationality spread of respondents suggests that this variable at least has not been skewed by a language restriction. It is also unlikely that foreign visitors to KNP have no understanding of English (*pers.obs.*).

7.4.2 Results from Independent Visitor Survey

Proportions of respondents willing to pay the five different bid levels, along with the projected increases in revenue accruing to the park at these fee levels, are shown in Table 7.6. Using the least squares method of regression, the equation with the best fit to the data results in a value of $k = 0.0739$ and a value of $c = 4.631$. This model provides a near perfect fit to the data, generating an r^2 value of 0.994. The resultant demand curve, and a curve of projected revenue against price increase are shown in Figs.7.6 & 7.7.

Table 7.6 Proportion of Respondents Willing to Pay Hypothetical Increases in Entrance Fee to Visit KNP, and Resultant Increase in Revenue to the Park.

Entrance Fee (US\$)	Proportion of sample willing to pay (%)	Price Elasticity of Demand	Projected revenue as a proportion of current revenue (%)
Current fee	100.00	-0.066	100.00
2	90.37	-0.148	203.08
4	79.31	-0.295	356.45
8	54.19	-0.591	487.13
16	28.18	-1.182	506.64
32	10.26	-2.363	368.77

There is a relatively low elasticity of demand for entry to KNP amongst independent visitors (Table 7.6). This would suggest that, all other things being equal, the current entrance fee is not a limiting factor in terms of visitation. Demand is relatively insensitive to price for even five-fold hypothetical increases in entrance fee. However, caution should be placed on the interpretation of results for larger hypothetical rises in fee, since they become less reliable with distance from the real fee.

The median WTP was US\$9.73, whilst the mean WTP was US\$11.70. These results suggest that, on average, visitors would be willing to pay over ten times the current fee for entrance to the park.

Differentiation of the demand function indicates that revenue would be maximised at a fee of US\$13.54. At this fee, an estimated 574% of the current revenue would be raised, whilst visitation levels would drop to 37.8% of their current level. The increased revenue would still not cover all of the park management costs, but would certainly cover the tourism-related costs. However, if the apparently greater willingness to pay of package operators for their clients to enter the park is taken into account (see below), it is unlikely that visitation levels will drop this dramatically. Thus a greater increase in revenue could be expected.

However, one must exercise caution in interpreting these results in this way. In addition to the uncertainties regarding the internal validity of the questionnaire method and the hypothetical nature of the inquiry, there are likely to be a number of additional effects of increasing the entrance fee beyond pure revenue maximisation (see Section 7.5). Therefore, a rise of entrance fee to a level at which revenues may be maximised may not be the best option. Any increase in fees should relate to the pricing policy of the park based upon the ultimate purpose of the park, and should take into account other internal and external implications.

Figure 7.6 Willingness of respondents to pay hypothetical increases in the entrance fee to visit KNP.

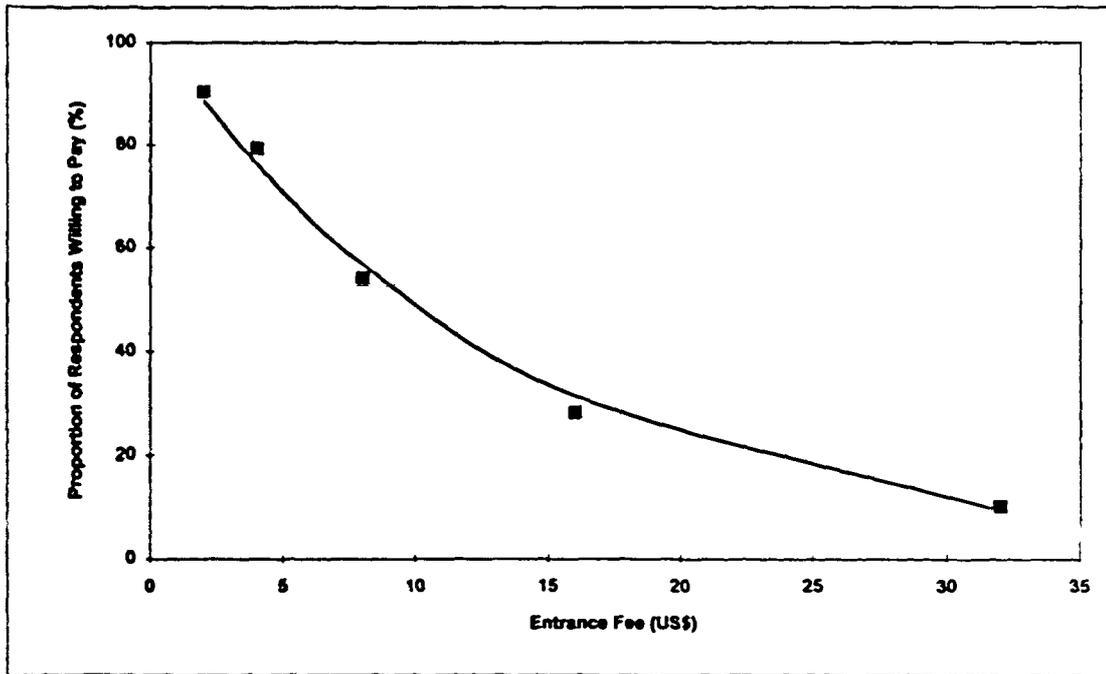
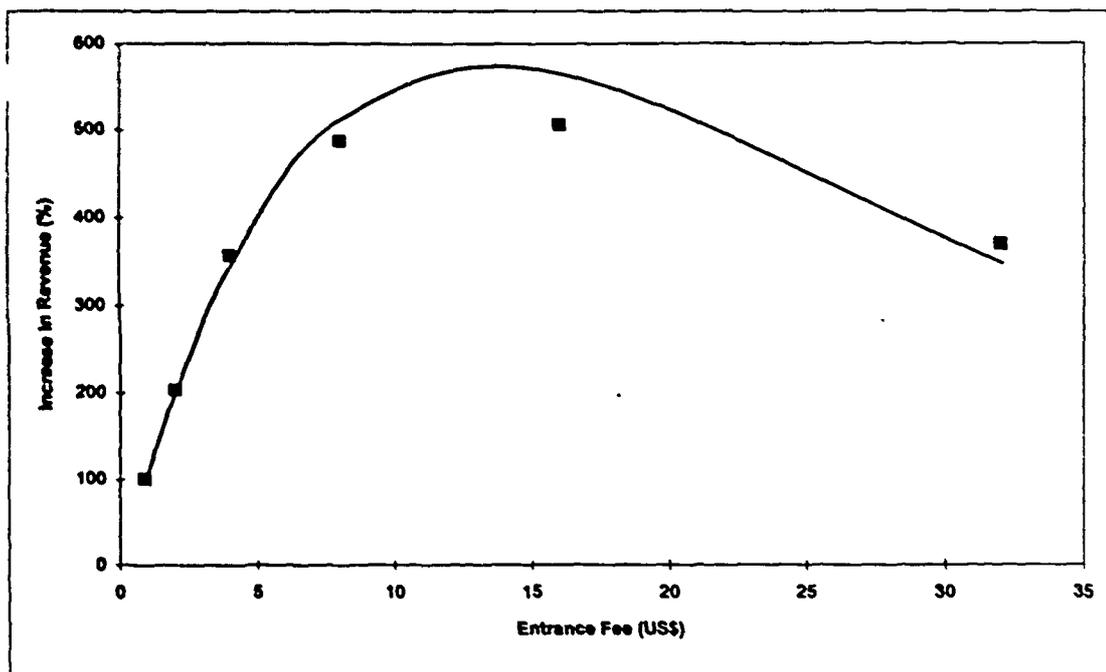


Figure 7.7 Proportional increase in revenue to the park at increased entrance fees, based on responses to willingness-to-pay questions.

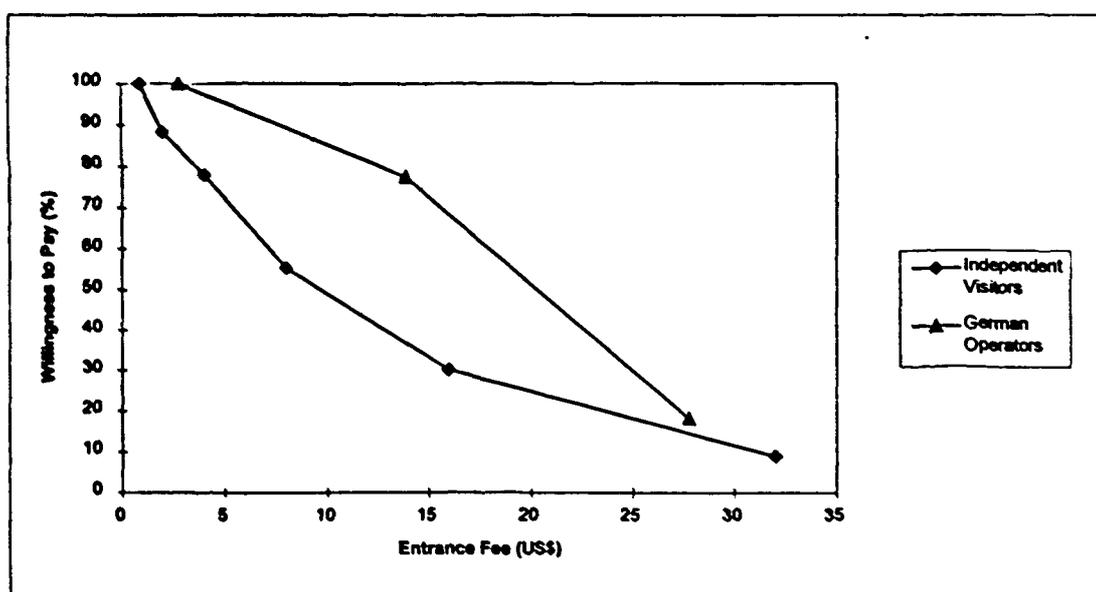


7.4.3 Results from Tour Operator Surveys

The average entrance fee suggested as appropriate by Indonesian tour operators was Rp10,750 (US\$4.66)(n=8), although the feeling amongst some respondents was that the price itself was not as important as the way that the revenue was used. According to one operator, structural adjustments should be made to allow the park to retain its entrance fee revenue. 80% of respondents stated that a fee of Rp10,000 would not affect their business, since this only represented 1-2% of the cost of a typical package. This suggests that demand is even less elastic for package tourists than it is for independent visitors, amongst whom an equivalent fee rise would result in a 20% drop in visitation (Table 7.6).

The majority of German tour operators questioned were prepared to pay DM20 (approximately US\$14), and a small proportion (18%) were prepared to pay DM40 (approximately US\$28). A demand curve constructed from these results, compared with that constructed from the independent visitor questionnaire conducted in KNP is shown in Fig.7.8. Caution must be applied in interpreting the comparison since the questionnaire instruments used for each sample were different, and the second sample was very small. However, a purely visual comparison suggests a higher willingness to pay amongst foreign package operators than amongst independent travellers. This is in agreement with the results of the Indonesian operator survey.

Figure 7.8 A Comparison of Willingness to Pay Increased Entrance Fees to KNP by Independent Visitors and German package Tour Operators.



7.4.4 Respondent Factors Affecting WTP

The results of the bivariate analyses are presented in Tables 7.7 and 7.8. Those of the logistic regression are presented in Table 7.9.

- **Chi-Squared Tests of Significance**

Most of the chi-squared contingency tables had total n-values of between 300 and 450. However, the extreme bid values of US\$2 and US\$32 had a very unequal distribution between 'will-pay' and 'won't-pay' responses, resulting in a high proportion of cells in the contingency tables with expected values <5. For this reason, only the analyses using bid values of US\$4, US\$8 and US\$16 can be considered to give valid results.

Of the seven categorical variables used in chi-squared analyses, three had observed values that were significantly different from expected (Table 7.7). Respondents who were members of conservation organisations (CONSORG) were more willing to pay increased entrance fees at all three bid levels. This result was significant at US\$4 and US\$16, but not so at US\$8. When responses were analysed by age category, observed values were significantly different at US\$8 and US\$16, but not so at US\$4. In each case respondents in the lowest age category (AGE) were less willing to pay than expected, whilst respondents in the other categories were more willing to pay. Using the self-ascribed variable TYPOLOGY (package, independent or backpacker tourist), responses were significantly different from expected at bid levels of US\$8 and US\$16, but not at US\$4. In both cases, backpackers were less willing to pay than expected, whilst independent and package tourists were more willing to pay than expected.

Responses divided by country of origin (COUNTRY), job (JOB), main reason for visiting Indonesia (MOSTIMP) and whether other walks on Komodo Island had been or would be undertaken (WALKS), were not significantly different from expected. For the first of these, however, it should be noted that domestic visitors and those from developing countries were not included in the analysis, since very few responses were obtained. This result suggests only that amongst European, American and Australian visitors there is no significant difference in willingness to pay.

- **1-Way ANOVA Tests**

Respondents willing to pay entrance fees of US\$4, US\$8 and US\$16 had seen a significantly higher number of dragons during their visit to the park (TOTAL) than respondents who were unwilling to pay those bids (Table 7.8). For the number of dragons seen in the visitor camp (INCAMP), the result was significant for bids of US\$8 and US\$16, whilst for the number of dragons seen outside the camp (OUTCAMP) the result was only significant for a bid of US\$8. Results were not significant for bids of US\$2 or US\$32 in any of the three analyses, probably due to the low number of one or other response in these cases (see above).

As might be expected, respondents who have paid more for their visit to Indonesia and to KNP were more willing to pay increased entrance fees (Table 7.8). This result was significant for the total cost of the visit to Indonesia (INDOCOST) at bids of US\$8 and US\$16. For average daily cost of visit (DAILY\$), and cost of visit to Komodo National Park (KNPCOST), the result was significant at bids of US\$8, US\$16 and US\$32.

Respondents who were willing to pay a particular entrance fee bid had a shorter length of stay in Indonesia (INDODAYS) than those unwilling to pay that bid for all bids except US\$2. Although this seems counter-intuitive, it is consistent with other results, since expenditure (and hence willingness to pay) is inversely proportional to length of stay. However, the difference was not significant except at a bid level of US\$32. Respondents who were willing to pay increased entrance fees had a significantly longer length of stay in the park (PARKNIGHT) than those who were unwilling to pay, at bid levels of US\$2, US\$4 and US\$32. The difference was almost significant at a bid of US\$16, but was not so at a bid of US\$8.

- **Logistic Regression**

The five variables included in the model, in order of entry, were; initial WTP-bid amount; daily expenditure in Indonesia; importance of marine environment in motivation to visit Indonesia; age category, and; number of dragons seen in KNP (Table 7.9). It is intuitive that older visitors, and those spending more on their holiday, should have a higher WTP. The inclusion of observed number of dragons as an explanatory variable may reflect the influence of a measure of visitor satisfaction with the current visit on stated WTP. The inclusion of the motivational category regarding the marine environment is unusual. The sign of the coefficient indicates that those respondents for whom the marine environment was a

Table 7.7 Pearson's Chi-Squared Results, Willingness to Pay Increased Fees vs. Categorical Variables.

Variable (df)	Level of Significance ³				
	US\$2	US\$4	US\$8	US\$16	US\$32
CONSORG (1)		*		*	
AGE (4)		*	***	(***)	
TYPOLOGY (2)			*	***	(***)
WALKS (1)	*				
JOB (5)					
MOSTIMP (1)					
COUNTRY (11)					

Table 7.8 1-Way ANOVA Results, Willingness to Pay Increased Fees vs. Continuous Variables.

Variable	Level of Significance				
	US\$2	US\$4	US\$8	US\$16	US\$32
Dragons Seen					
INCAMP			**	***	
OUTCAMP			**		
TOTAL		*	***	***	
Other Variables					
INDODAYS					*
INDOCOST				**	
DAILY\$			**	***	***
KNPCOST\$			**	**	**
PARKNIGHT	**	*			***

relatively important reason for their visit to Indonesia have a lower WTP than those for whom it was less important. This seems counterintuitive if the variable is viewed as an indicator of a propensity for seeking 'natural' destinations. However, a number of the backpacker tourists visiting the park were surfers who had come to Indonesia for the well-known quality of its

³ *: $p < 0.05$, **: $p < 0.01$, ***: $p < 0.001$, (): >25% of cells in contingency table with expected values < 5.

surf (*pers.obs.*). These were also budget travellers who were attempting to travel as cheaply as possible. This may explain the inverse relationship between the Marine variable and WTP.

The variables included in the model and their order of entry did not change as the variables in the analysis were altered (Section 7.2.2). However, as sample size increased, the goodness of fit of the model decreased slightly. The largest possible sample, with only the five significant variables included in the analysis, was 326, which yielded a goodness of fit of predicted scores to observed scores of 70.9%. This compares favourably with a maximum goodness of fit of 74.4%, with a sample size of 254 and 18 variables included in the analysis.

Table 7.9 Estimates of Coefficients of Variables Included in Logistic Model

Variable	n = 254			n = 326		
	B	S.E.	Sig	B	S.E.	Sig
Age			0.06			0.02
Age (1)	2.02	2.79	0.47	1.16	0.39	<0.01
Age (2)	1.27	2.78	0.65	0.40	0.36	0.27
Age (3)	0.91	2.80	0.75	0.09	0.44	0.84
Age (4)	-0.64	2.91	0.83	-1.03	0.71	0.15
Marine	0.47	0.15	<0.01	0.39	0.13	<0.01
WTP value	0.24	0.04	<0.01	0.20	0.03	<0.01
Daily Spend	-0.01	<0.01	0.01	-0.01	<0.01	0.01
Number of Dragons	-0.23	0.08	<0.01	-0.08	0.03	0.01
Constant	-4.66	2.88	0.11	-3.00	0.75	<0.01

7.5 Visitor Attitudes Towards Tourism in KNP

It has already been shown that a measure of satisfaction (i.e., number of dragons observed) will affect WTP (see Section 7.4.4). This section examines both prompted and unprompted statements from questionnaire respondents, and attitudes conveyed to the author in person, regarding their level of satisfaction and their attitudes towards future change. It is clear that

visitor experiences differ widely. A variety of perceptions and attitudes were encountered, and are explored below. A number of direct quotes are also presented in Appendix B.

7.5.1 The Current Visitor Experience

• Facilities and Service

Several visitors stated that the rangers were friendly and offered a quality service. However, many others mentioned some combination of facilities, service and food being of inferior quality, expensive and in need of improvement. Some respondents felt that the quality of washroom facilities in particular was unacceptable. Some thought highly of KNP as a whole but felt that the unacceptable standard of facilities and service had spoilt their visit. Some said they would stay longer if these areas were improved. One said the high prices made KNP 'seem like a money-making park'. Rp15,000 is viewed as too high a price for accommodation when mosquito net, fan, a real bed, and breakfast are not included.

When asked about their desire for additional facilities in KNP, the most common unprompted response was the desire to see improved cafeteria, rangers and accommodation facilities (29 in total). With regard to guides, an improvement in their English language skills was requested by two respondents, and one specifically asked for a trained naturalist who spoke English. Two people mentioned Bukit Luang (an orang utan centre in Sumatra) in the context of cheaper/better service and facilities, and in terms of a TV programme of the centre and its animals which is shown there.

• Guided Walks

There was also considerable feeling that the Banu Nggulung trail was overcrowded, and that too many tourists were being taken there in groups that were too large. Three people wanted quiet hides as an alternative viewing experience, one for birds and one at a dragon nest. Another respondent suggested developing other, longer trails into the interior of the island.

When asked about their intentions to undertake other guided walks around Komodo Island, a number of respondents made additional unprompted comments regarding this aspect of the visitor experience. The majority of these comments concerned the fact that information was not available about other walks or the need to book them in advance, and that guides were not available to accompany visitors when they requested them. A number of respondents also felt that these other walks were prohibitively expensive, and complained that, after paying the

entrance fee, everything outside of the visitor camp had to be additionally paid for. One respondent, who felt that wildlife posed little danger and who perceived the protection and interpretative services afforded by guides to be inadequate, questioned the need for guides on walks at all.

- **Transportation**

The issue of boats and transportation was raised by a number of respondents (Appendix B). Some visitors complained about the reliability of the ferry between Sape and Labuan Bajo. Others stated that they wouldn't have stayed overnight in KNP, or would have stayed longer, if it hadn't been for the erratic ferry timetable, and no ferry on Fridays. Of particular concern to ferry passengers was the lack of prior information regarding the fact that, due to the shallow water in Loh Liang bay, it is necessary to take a local shuttle boat between the ferry and the pier on Komodo Island. This service requires an additional on-the-spot payment by visitors, leading to confusion and antagonism between visitors and crew.

7.5.2 Additional Facilities Within the Park

Respondents to the questionnaire administered to tourists in the visitor camp on Komodo Island were asked whether they would like to see specific additional facilities in KNP. The categories of facility included in the question, and the frequencies of responses, are presented in Table 7.10.

The most popular additional facilities indicated by respondents were educational. 59.7% of respondents would like to see information boards, whilst 42.6% would like to see labels on trees and vegetation. The third most popular addition would be hides for viewing wildlife (27.7%). A new interpretation centre, and glass-bottomed boats for viewing marine life, both received a similar amount of support (21.6% and 21.0% respectively). A small number of respondents would have liked public toilets for day visitors (15.6%). These are in fact available, but not well signposted or maintained.

41.9% of respondents (n=408) stated that they would stay longer if the extra facilities they had indicated were present. Certain facilities appear more able to entice visitors to stay longer than other facilities do. 60.0% of respondents requesting glass-bottomed boats said that this facility would entice them to stay longer in KNP. Around half of respondents requesting viewing hides and a new interpretation centre said that these facilities would entice them to

stay longer (51.7% and 51.3% respectively). Labels on trees and information boards, whilst both very popular additional facilities, were less likely to entice visitors to stay longer (44.4% and 41.5% respectively). Note that respondents were not asked if they would pay more for these additional facilities. Staying longer is not necessarily the same as spending more money, but it could be made to be, either through a daily or increased one-off fee, or through additional charging for facilities.

Table 7.10 Additional Facilities Desired by Questionnaire Respondents, and Proportion Who Would Stay Longer.

Facility	Proportion of Respondents (%)	Proportion Who Would Stay Longer (%)
Information Boards	59.7	41.5
Labels for Trees	42.6	44.4
Hides	27.7	51.7
New Interpretation Centre	21.6	51.3
Glass-Bottomed Boats	21.0	60.0
Public Toilets	15.6	37.8
Total		41.9

When respondents were asked to state additional items they would like to see available in KNP, the most common answer was books and information on dragons and wildlife (20), followed by posters and better postcards of dragons and wildlife (11). Several people wanted to see more T-shirts available, and 5 comments specifically mentioned the need for larger sizes to be made available, since currently available stock is usually too small for non-Asian visitors. Around 4% of the total sample (20) mentioned specific food items which they would have liked. Most common amongst these were fruit and vegetables (8) and dairy products (7). Fresh fish was also mentioned. A number of other items were requested, mostly some form of local craft or clothing (16). Notable among these were requests for rangers' hats and dragon teeth as souvenirs.

Electricity, and specifically lights at night, were requested by two respondents. Others wanted the provision of snorkelling equipment and transport from Loh Liang to red beach where snorkelling currently takes place (as of August 1996 this facility is available). Two respondents added that they would like to see the resumption of dragon feeding, an opinion

voiced by a number of other visitors who arrived unaware that feeding had been discontinued (*pers.obs.*). However, many others were glad to see that feeding had stopped. Other requested facilities included a museum, an elevated walkway, a money changer, emergency telephone, showing of documentaries about the dragon, and signposts warning visitors not to interfere with the wildlife.

There were 8 comments that KNP shouldn't be commercialised, and that it is good because there is little to buy. It was felt that KNP should be kept basic and environmentally friendly. Another made the comment that added facilities should only be developed around the visitor camp on Komodo Island. Both public toilets and glass-bottomed boats received a few 'No!' responses. One respondent felt that promoting KNP by encouraging snorkelling and glass-bottomed boats was not a good idea, since they are not the reason people come to KNP, and can be undertaken elsewhere.

7.5.3 Raising Entrance Fees

A number of respondents made additional comments when asked about their willingness to pay increased entrance fees. 28 additional comments were made regarding the raising of entrance fees. These fall into a number of categories.

- 5 respondents stated that their willingness to pay increased entrance fees was contingent upon the improvement of existing facilities and the inclusion of added extras in the fee, notably guiding fees, insurance and an information leaflet. Of three respondents who wanted to see a resumption of dragon feeding, one indicated that his willingness to pay increased fees would be contingent upon this resumption.
- 6 respondents were willing to pay more if the extra revenue was needed for the upkeep of the park and was used properly. A further 4 respondents wanted information to be available to visitors on the use to which the entrance fee was put.
- A number of respondents made comments about the effect of raising prices on different user groups. Two said that raising fees would make the park too expensive for domestic tourists, and one said the same about backpackers and suggested student discounts. Two others said that the fee should not be so high as to discourage low income visitors, but acknowledged that the current fee was too low for foreign tourists. One suggestion was to

raise the fee by a small amount but install a donation for those who wish to contribute more, with details of the way the money is used.

- Two respondents stated that raising entrance fees would alter their visit, either by lengthening it to get value for money, or limiting it to Komodo rather than Rinca. One suggested that it wouldn't matter what fee was charged because, without access to prior information on prices, arrivals by ferry have no choice but to pay whatever entrance fee is charged.
- One respondent asked that fees were not raised too rapidly, and the most practical and least disruptive way to raise fees would be incrementally over a period of time, so that information had time to spread and did not go out of date immediately. Another suggested that a fee of US\$16 would be 'pushing it', given that San Diego Zoo currently charges an entrance fee of between US\$13 and US\$18.

7.6 Discussion

The preceding analyses have identified a number of important findings with respect to the financial contribution of tourism to KNP. These are summarised here, and discussed in the wider context of the research in Chapter 10.

Entrance fees are set at a low level. As a result, the revenue currently generated from entrance fees may barely offset the purely financial estimates of the cost of tourism KNP, but it does not contribute to traditional management costs. Token pricing has been a deliberate policy in Indonesia, as in many countries, to allow access to protected areas regardless of wealth. However, 93% of visitors to KNP are foreign tourists. Therefore the Indonesian government, rather than providing access to KNP for poorer domestic visitors, is essentially subsidising the visits of wealthier foreign visitors. This suggests that the current pricing policy, in common with that in other developing countries (Child and Heath, 1990), is inappropriate given the type of visitation that exists.

In addition to the entrance fee, considerable revenue is generated by guiding and accommodation services in KNP, and in the cafeteria. Furthermore, whilst each visitor contributes an equal amount with respect to entrance fee, additional expenditure is dependent

upon length of stay. Ironically, the least affluent visitors contribute the greatest amount per person to expenditure in KNP. However, none of this expenditure accrues directly to KNP.

The revenue from entrance fees is divided between various levels of government. Revenues from guiding, accommodation, and cafeteria purchases accrue to the local Koperasi co-operative. There is no direct linkage between tourist revenue generated in KNP and management costs, since none of the revenue remains within KNP. Furthermore, organisations benefiting from KNP, such as the Koperasi and visitor transport operators, make no contribution to KNP. Thus there is a disincentive for managers to develop and improve the tourism experience, since increasing visitation or visitor expenditure in KNP would not result in increased revenues for use in park management and protection. It is clear that there are several means of generating revenue from tourism based upon KNP which are not being exploited for the benefit of KNP itself. Such a situation in Hwange NP, Zimbabwe, combined with government underfunding, resulted in a decline in park infrastructure and staff morale (Potts *et al.*, 1996).

Demand for entrance to KNP amongst foreign visitors is inelastic with regard to entrance fee. A five-fold increase in entrance fee would have little effect on visitation, and average WTP was over ten times the current fee. This suggests that there is considerable scope for increased revenue generation by increasing fees. Small increases would offset the costs of tourism and provide revenue for traditional management costs, and even large increases (US\$10 and above), whilst having a dramatic effect on independent visitor numbers, would still result in net increases in revenue to park management.

The elasticity of demand varies across the spectrum of visitors to the park. Thus, the impact of price rises is not confined to the volume of visitation, but will also affect the composition of the visitor population. Not all visitors to KNP would be able, let alone willing, to pay considerably higher entrance fees. Even small rises may be out of the reach of domestic visitors. Rises of several dollars would deter some of the independent backpacker travellers, particularly the younger and less affluent. However, even quite significant rises in the entrance fee could be comfortably accommodated within package tour prices. A universal increase risks discriminating against some types of visitor, namely domestic and lower-budget foreign visitors. A solution to this is differential pricing, with different levels of fee for different users (Jansen, 1993; Laarman and Gregersen, 1996). A policy of different rates for

domestic and foreign visitors is increasingly being implemented in protected areas in developing countries.

Whilst WTP may be considerable, any unannounced fee rise which is not demonstrated to benefit KNP or improve the tourism product is likely have a negative effect on visitor satisfaction. Comments were made from both visitors and operators that increased fees should be used for the running of the park, and more specifically to improve tourism facilities and service, which are perceived by many to be unacceptable at present. Visitors also expressed a desire to know how their fees were being spent in KNP. Whilst improvements should be made, it is clear that visitors do not want excessive development. The maintenance of a natural environment and 'wilder' experience is important for many visitors, and is also more compatible with the conservation objectives of the park.

A clear need is expressed by visitors for more information. This includes educational material such as information boards, wildlife films, naturalist guides etc., but also practical information about the tourism experience in the park. Of particular importance is widely distributed pricing information available before arrival at the park, and also information on the availability of other walking activities and how to go about booking them. The provision of this information would not only increase tourist expenditure and willingness to pay directly, but also indirectly through increased visitor satisfaction.

The decision of whether and by what amount to raise fees must ultimately refer to park policy on visitor access and pricing. If the park must financially justify its existence, or its expenses with regard to tourism, then fees must be raised to recoup these expenses, or other mechanisms must be constructed to increase revenues. However, a purely financial analysis fails to recognise the aesthetic and amenity values of parks for the general public, which are maximised by token pricing but which increased fees would curtail. This is a political and philosophical argument about the ultimate function of protected areas. In addition it must be recognised that, particularly in rural and under-developed areas, the issue of park pricing is not isolated from the surrounding local and regional economies. Low pricing of public amenities such as parks, resulting in higher visitation rates, can be a deliberate policy to stimulate local economic development in the private sector (Laarman and Gregersen, 1996). It is clear from this research that large increases in fees, by the nature of the differential effect of price increase on users, could have negative effects on the local economy (see Chapter 8).

8. The Local Economic Impacts of Tourism

8.1 Introduction

The third assumption of ecotourism is that it makes a positive contribution to local community development (Chapter 1). It recognises that local people often bear the greatest costs arising from protected areas, and should therefore receive adequate benefits. Tourism is the principal means by which benefits can be generated from protected areas. However, whatever the economic value of protected area tourism, the distribution of benefits and costs is rarely equitable. In addition, local benefits will be tempered by the amount of revenue that either bypasses or leaks from the local economy as a result of the import of goods and services from outside the local area (Chapter 2). Despite the importance of this type of analysis, little empirical work has been carried out (Sinclair, 1991; Wells, 1992).

KNP is situated in a relatively poor, rural area of Indonesia. Tourism to the park has the potential to contribute significantly to the surrounding local economy, through employment and revenue generation, and to stimulate local development. However, the extent to which local communities actually benefit, both socially and economically, may not fulfil this potential. This chapter examines the contribution of tourism to town and village communities surrounding KNP. The following are the major areas of inquiry;

- What is the magnitude of tourism in local communities?
- How is tourism affecting patterns of development in local communities?
- What type and magnitude of local employment is generated by tourism?
- What is the magnitude of the local revenue generated by tourism?
- How is revenue distributed within the local economy?
- What level of tourist expenditure bypasses or leaks from the local economy?

Two issues are of particular interest. The first is the division of benefits between the island villages, which are within the park and which suffer the greatest disbenefits of conservation, and the gateway towns, within which tourism development has been concentrated (Chapter 3). The second is the relative contribution of different types of visitors to KNP, as identified in Chapter 5. The costs which local people associate with tourism are examined in the following chapter (Chapter 9).

The methodology for examining local economic impacts is presented in Section 8.2. An examination of tourism development in local communities is presented in Section 8.3. This is followed by analyses of the contribution of tourism to local employment (Section 8.4) and revenue generation (Section 8.5). Distributional issues are highlighted in both of these sections. The chapter ends with a discussion of the findings (Section 8.6).

8.2 Methodology

Traditional economic analysis would estimate impacts using macroeconomic techniques such as input-output analysis. Such large-scale techniques are inappropriate for local level inquiries where significant data are often unavailable, and are inevitably weakened by inaccurate assumptions and aggregation (Kottke, 1988; Lea, 1988; Smith, 1989). In addition, traditional economic analyses fail to recognise distributional effects (de Kadt, 1994). The focus of this study is not regional economic impact, but rather the local impacts, including employment, distributional effects and tourism-induced change, in small, defined communities within and surrounding KNP. These impacts are most thoroughly identified by direct estimation from primary data sources and the use of local secondary data sources. In this study, simple survey techniques have been employed to identify the magnitude and distribution of direct economic impacts, and the level of bypass and leakage from the local economy.

It should be noted that analysis has been confined to the impacts of foreign visitors, for a number of reasons. Firstly, it is difficult to separate domestic tourists from domestic business travellers staying in local towns, and so it is safer not to include them. Secondly, some data sources for visitation and accommodation patterns refer only to foreign visitors. Thirdly, local people associate 'tourist' with foreigner, and when questioning local businessmen and townspeople the emphasis was very much on the impacts of foreign visitors. Finally, visitors to KNP are predominantly (93%) foreign, so any additional impact of domestic tourists will be small in comparison to that of foreigners. From hereon the term 'visitor' equates with foreign tourist. The period of investigation was confined to the year 1995/96.

8.2.1 Tourism Development in Local Communities

- **The magnitude of tourist visitation**

Not all visitors to KNP pass through the local gateway towns or come into contact with communities in KNP. Those travelling by cruise ship are isolated from any contact except the purchase of souvenirs or hire of guides in KNP (Section 8.5.4). Visitors by charter boat or ferry will pass through and may stay overnight in Sape and/or Labuan Bajo. The magnitude of tourist visitation to local communities has been estimated from data on arrivals and overnight stay. Data regarding arrivals and departures to Sape and Labuan Bajo by different forms of transport were obtained from KNP records, harbour offices, and company records (Pelni ferries, Merpati air). Data regarding overnight stay in Sape and Labuan Bajo were obtained from hotel records and police registration forms. Visitor length of stay was estimated from hotel records and from responses to a visitor survey in Labuan Bajo (see below). Triangulation of different data sources allowed an estimation of total number of visitors and total bed nights in each of the towns (Section 8.3.1).

- **The development of local tourism businesses**

An inventory of tourism-related businesses was compiled, and questionnaire surveys undertaken with the proprietors of local hotels, restaurants, shops and charter boats (Section 8.3.2). The year of establishment of all hotels and restaurants, and a sample of local shops, was ascertained (Section 8.3.3). The location of each hotel and restaurant (town, harbour-view, beach, island) was recorded, along with the class (for hotels) and menu style (for restaurants). The surveys also recorded the origin of the owner of each establishment (local district, local province, elsewhere in Indonesia) (Section 8.3.4).

The distribution of visitor patronage of hotels and restaurants with regard to style and location was also examined. Hotel records and personal observation provided some comparative data on visitor choice of accommodation. The restaurant survey included questions regarding the proportion of customers who were foreign tourists, the volume and frequency of tourist patronage, and a number of estimates of total revenue.

8.2.2 Tourism-related Employment

Surveys of local businesses also provided data regarding employment. Respondents were asked the total number of their employees. For each employee they were asked the type of job

undertaken, monthly salary, the age and sex of the employee, their level of education, where they were born and whether they were related to the owner/proprietor of the establishment (Section 8.4).

Not all of the jobs in tourism-related enterprises are supported by tourism revenue alone, since many of these businesses cater for local customers and domestic business clients, or undertake other activities in low season months. An estimate of the number of 'full time equivalent' jobs attributable to tourism was made by multiplying the number of employees in a business/sector by respondent estimates of the proportion of total revenue attributable to tourists, or the proportion of clients who were tourists, or (for charter boats) the proportion of time spent undertaking tourism-related activities.

8.2.3 Tourism-related Revenue

- **Revenues generated by tourism**

Direct economic impact, in terms of revenue accruing to the local communities over a defined period of time, can be estimated in two ways. Firstly, by multiplying total visitor numbers by an estimate of expenditure per visitor from a visitor survey. Secondly, by extrapolating revenue estimates from a sample of local tourism-related enterprises to the total inventory of tourism-related enterprises (Smith, 1989). Both approaches have been taken in this study, to improve the accuracy of estimates (Section 8.5.1).

A questionnaire was administered to tourists in Labuan Bajo during August 1996. The objective of this survey was to identify visitor spending patterns for a number of categories of purchase, as estimated by the tourists themselves. Questionnaires were randomly distributed to respondents in 9 locations in Labuan Bajo (hotels and restaurants), and a total of 227 responses collected. After the initial classification questions (sex, age, nationality, profession), a number of questions addressed respondents' means of transport and places visited east of Bali. Respondents were then asked to state their length of stay in Labuan Bajo, and to estimate their expenditure in nine categories. The first four categories were estimates of daily expenditure on accommodation, food, drink and alcohol. The subsequent five categories were estimates of total expenditure in Labuan Bajo on souvenirs, tours, buses/taxis, charter boats and ferries.

Surveys of local businesses, as described above, were carried out in Labuan Bajo and Sape during August 1996. These included questions regarding income generated by tourism. However, responses were sometimes difficult to obtain. Data from restaurants was relatively complete, since three separate questions were included allowing different estimates of revenue to be made. Accurate data from hotels was difficult to obtain. As such, estimates of revenue were made from reported room rates and estimated bed nights. Data from charter boats also proved difficult to obtain. A comprehensive survey of charter boats was impossible given that most boats were only in port for a short time between excursions. In addition, boat captains did not have access to revenue records. Estimates of revenue to the charter boat sector were made based on reported rates and KNP records of arrivals, with additional estimates of revenue from charter trips other than to KNP based on personal observation.

Information on tourism-related revenue and employment within Kampung Komodo was collected by interview with key informants, and Koperasi records of casual employment in KNP and the sale of handicrafts.

- **Distribution and Leakages**

The distribution of revenue and employment between sectors, and between individual hotels and restaurants, was identified using business surveys as described above. Within the charter boat sector, distribution of revenue between boats, and specifically between local independent boats and non-local boats or those contracted to external operators, was estimated using KNP records of individual charter boat arrivals as a surrogate for revenue.

Estimates of leakage of revenue from the local economy were based on levels of non-local ownership (for public transport and charter boats) and import of non-locally produced goods (for restaurants and shops). In addition, an estimate was made of the amount of tourist expenditure on visits to KNP which bypasses the local economy through external operators and 'enclave' tours which prevent contact between visitors and the local economy. This was based on KNP records of visitor mode of transport (Chapter 5) and reported or estimated costs of different types of visit to KNP.

It should be noted that in many cases both primary and secondary data were incomplete or unreliable, necessitating triangulation and the inclusion of informed assumptions, in many of the estimates contained within this chapter. In an effort to maintain the clarity of the

following results sections, only summary tables are presented. For a detailed presentation of data and estimation procedures, see Appendix C.

8.3 Tourism Development in Local Communities

8.3.1 The Magnitude of Tourist Visitation

It is clear that the greatest contact of the local community with foreign visitors occurs in Labuan Bajo (Table 8.1, and see Appendix C for detailed estimations). An estimated 11,000 people, staying an average of three days and three nights, spend an estimated 33,000 bed nights in and around the town. Sape receives far fewer overnight foreign visitors, around 1,100. However, several thousand foreign visitors pass through the town each year, *en route* to KNP and the islands to the east. Sape is a transit stop for visitors changing from bus and taxi transport to ferry and charter boats, and as such the contact of local people with tourists is confined primarily to the transport termini. Therefore, fewer opportunities are likely to exist for local people to benefit from tourists in Sape than in Labuan Bajo.

Table 8.1 Estimates of Visitation to Local Communities Around KNP, 1995/96.

Town	Labuan Bajo	Sape	Kampung Komodo
Transients ¹	0	11,000	4685 ²
Day Visitors	0	0	?
Overnight Visitors	11,000	1,100	0
Bed Nights	33,000	1,100	0

The potential for benefits is even more limited for the local people living within the park. The villages on Rinca Island, Kampung Rinca and Kerora, receive no visitors. Kampung Komodo does receive some visitors, and the community comes into contact with many more tourists as a result of the close proximity of the Loh Liang visitor camp. However, no visitors stay overnight in the village, and it does not offer services such as restaurants and shops. Benefits from tourism accrue to the village indirectly via association with Loh Liang. As such, benefits are not related to the volume of visitation to the village itself.

¹ People for whom the location was a transit stop and not an overnight destination.

² ferry passengers who use the village shuttle boat to reach the visitor camp, but who do not disembark at the village.

8.3.2 A Survey of Tourism-Related Businesses

A number of sectors of the local economy benefit directly from tourism, and for some it constitutes the major source of revenue. Principal amongst these are the hotel sector, restaurant sector, retail outlets, transport services, and charter boats.

Table 8.2 Inventory of Local Tourism-Related Businesses

	Labuan Bajo	Sape	Kampung Komodo
Hotels (class A)	1	-	-
Hotels (class B)	10	-	-
Hotels (class C)	7	4	-
Total Rooms	203 ³	58	-
Total Beds	375	94	-
Restaurants	25	13	-
Capacity	550	186	-
Charter Boats	67	13	2 ⁴

Labuan Bajo is the major centre of tourism development associated with KNP, with a greater number and quality of services than in Sape (Table 8.2). This is probably because Labuan Bajo is closer to KNP, the sea crossing to KNP is easier, and access to Labuan Bajo itself is easier as a result of recent developments in transport infrastructure. Kampung Komodo has no formal service industry, and development of tourism enterprises is limited to the provision of a shuttle boat service and the production of wooden dragon carvings (see below).

- **Labuan Bajo**

Accommodation facilities in and around Labuan Bajo are classed as A, B, 1B or C (Table 8.2). Class A hotels are the higher priced 'resorts', occupying beach or hilltop locations. Classes B and 1B are the standard priced tourist class hotels, with a difference in quality and small difference in price between the two grades. Class C is the traditional *losmen* style of accommodation, which is basic and inexpensive. According to local government records there are four Class A hotels in Labuan Bajo, however by 1996 only one remained open. There are three Class B and 7 Class 1B establishments. Of these, one is a beach resort a short

³ excluding class C establishments.

⁴ two shuttle boats transporting passengers from the ferry to the island.

boat ride from Labuan Bajo, and two are small island resorts, also reached by boat from Labuan Bajo (Fig.8.1). In addition there are seven Class C losmen. The total capacity of hotels is approximately 203 rooms (375 beds), and that of losmen is approximately 75 rooms (147 beds).

There are 25 outlets serving food in Labuan Bajo, ranging from conventional restaurants and *rumah makans* to the more traditional roadside *warungs* (Table 8.2). Two of these establishments serve the *Padang* style of cuisine from Sumatra, which is essentially a selection of cold dishes chosen from a window display and served with rice. The majority serve traditional Indonesian cuisine, some incorporating Chinese and European influences. Eight are restaurants within hotel establishments. The total capacity of all outlets is approximately 550. In addition, the beach resort of Waecicu and the island resorts of Pungu and Kanawa (Fig.8.1) have their own restaurants providing for guests.

Some 67 charter boats from Labuan Bajo offer day or overnight round trip tours to KNP and adjacent islands, and longer passages to and from Lombok. The one way trips to and from Lombok are offered by professional carriers and by a co-operative organisation. There are 20 boats in the co-operative. Of these, ten are local boats and ten are boats from Lombok. In addition, a total of 47 charter boats were recorded in KNP records as having visited KNP during 1995/96 from Labuan Bajo on shorter round-trips, although incomplete records suggest that this number may be higher, particularly at peak times. For charters to and from Lombok, there is a regular schedule of twice weekly departures and arrivals during the peak season, decreasing during quieter periods. Tourists are required to book in advance for these trips. The shorter round trip charters, to the park and smaller islands, are more casually arranged, with individual captains hiring out their vessels on an *ad hoc* basis. Most of these boats are not designed to take tourist passengers. Few are equipped with safety and comfort facilities, or with crew able to speak English or other foreign languages. Many are fishing vessels which have turned to tourism as a more profitable enterprise, seasonally if not year-round.

There are four arts/souvenir shops which are exclusively aimed at tourists. Two of these are owned by the same individual. A full inventory of retail outlets (Fig.8.2) was not made, since most of these cater for the local market, and only a small proportion of customers are tourists.

Figure 8.1 Map Showing Labuan Bajo and Locations of Nearby Beach and Island Resorts.

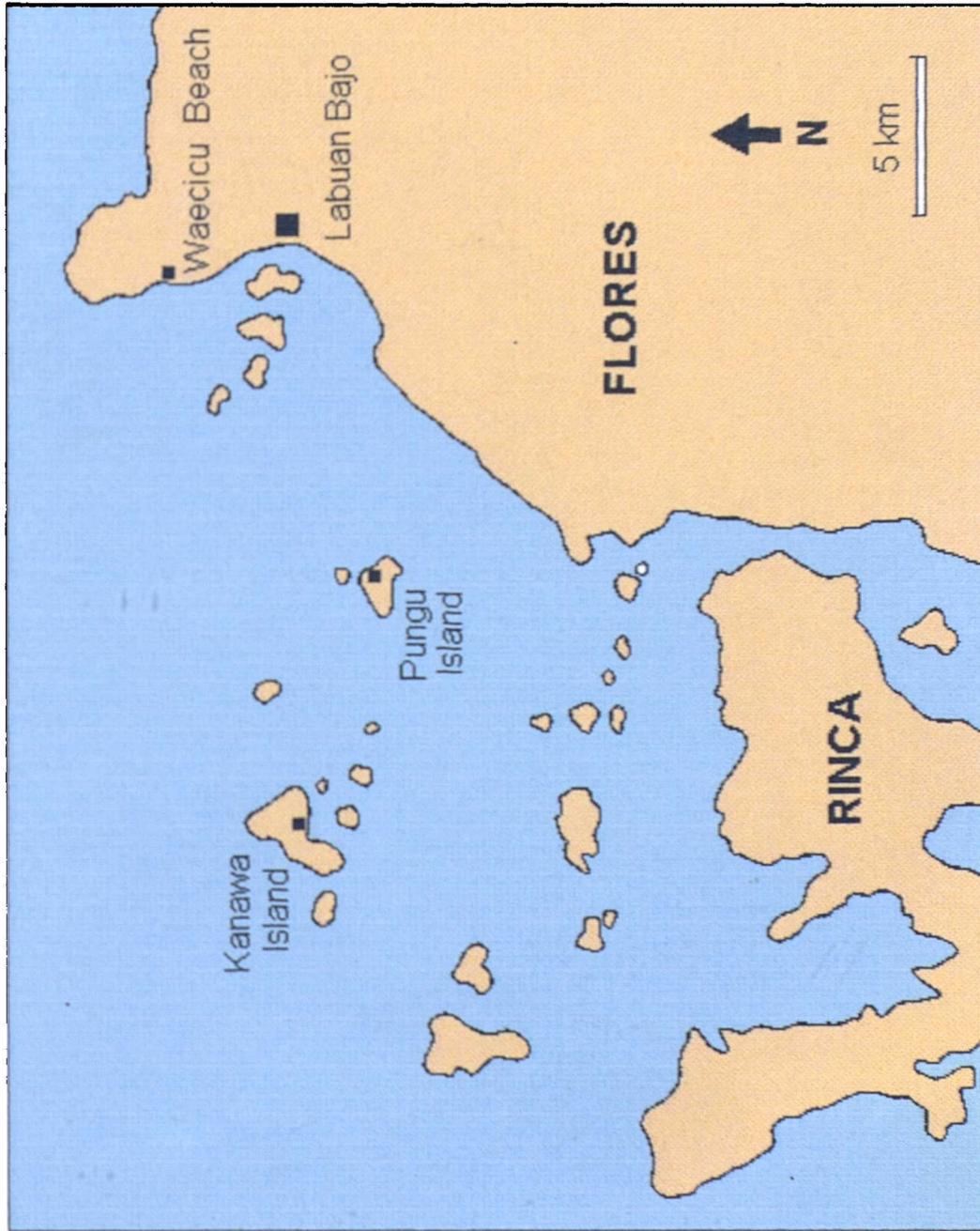
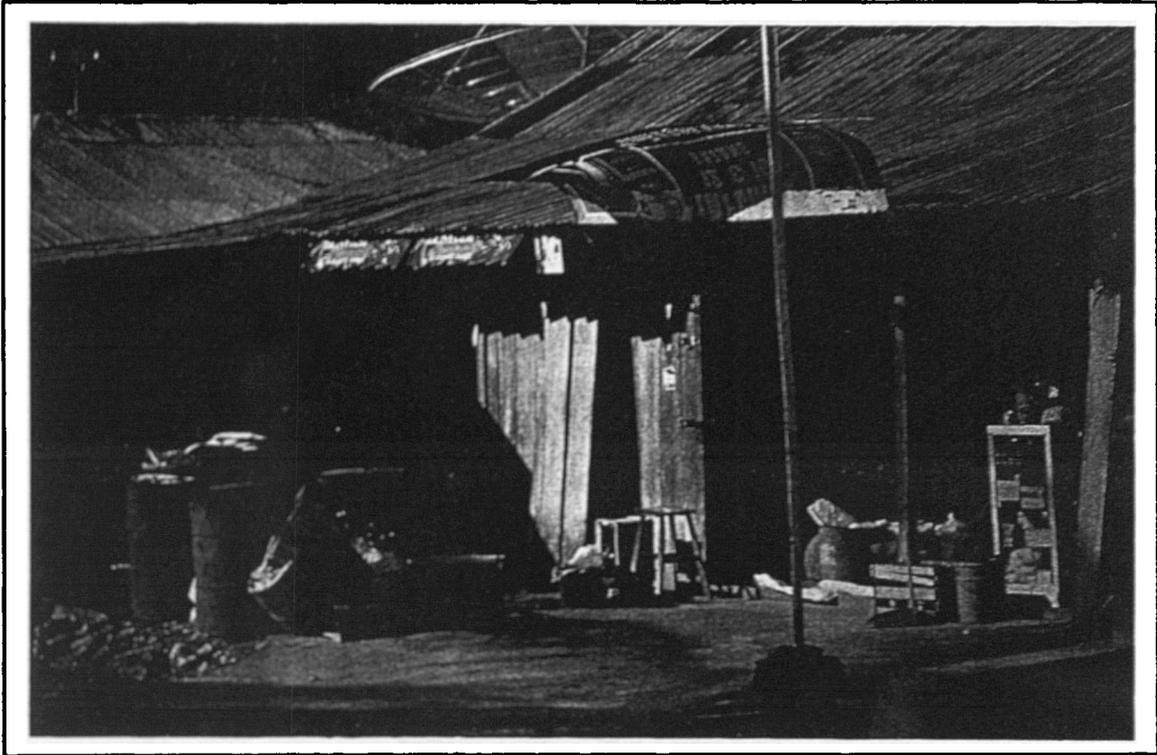


Figure 8.2 A Typical General Retail Store in Labuan Bajo.



There are numerous local vehicles which serve as public taxis in and around Labuan Bajo. They are essentially for local people, but receive some business from tourists, particularly during the heat of the day. In addition, there are a number of minibuses and small buses which run between Labuan Bajo and towns further east across Flores. Buses to Ruteng (four hours) leave 3-4 times throughout the day. Those to further destinations leave daily at dawn.

- **Sape**

Sape only has four losmen offering overnight accommodation (Table 8.2). 94 beds are available in 58 rooms. Facilities are basic and prices are low. There are no tourist class hotels available. There are thirteen restaurants in Sape, with an approximate total capacity of 186 chairs. Three of these are Padang restaurants, the remainder Indonesian. None of them are part of accommodation establishments.

A number of charter boats run cruises between Sape and KNP, of which eleven are regular visitors. Six of these are owned by tour companies from outside Sape, whilst five are part of a local co-operative. Virtually all of the trade for these boats comes from package tours booked through operators in Bali and Bima.

There are numerous buses and taxis running between Sape and Bima, but none are locally owned; they all originate from Bima. Horse carts are the local form of public transport within Sape, over distances of a few kilometres. There are an estimated 750 of these *benhurs* operating in the town, the vast majority catering for local trade. Tourists do use this service to travel the few kilometres between Sape town, where three of the four losmen are located, as well as the central bus terminus, and the harbour.

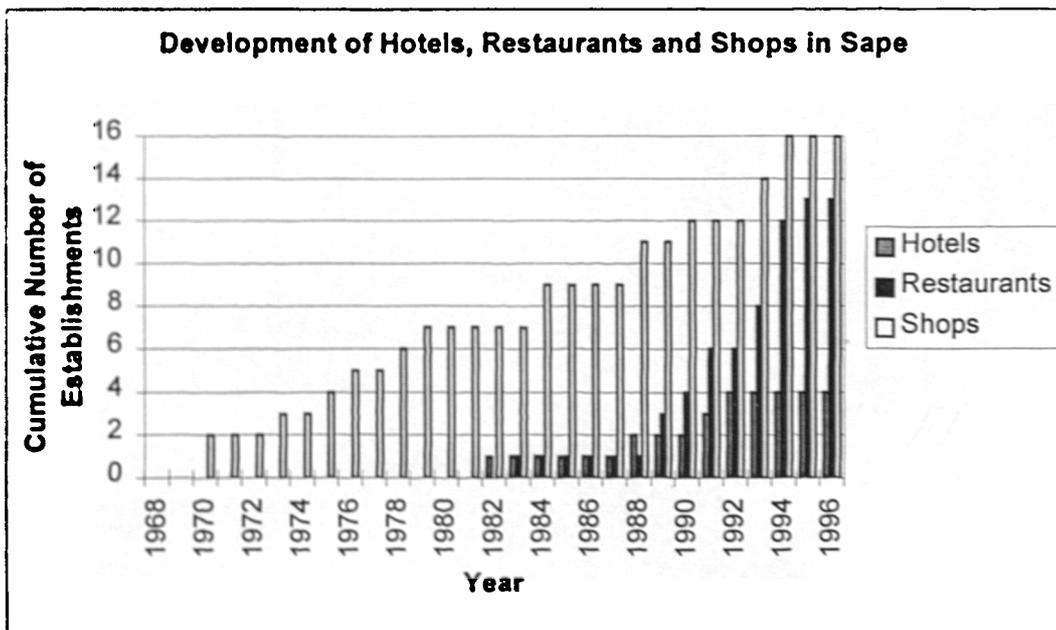
8.3.3 The Rate of Local Development

The cumulative development of tourism-related business in Labuan Bajo and Sape are shown in Figs.8.3 and 8.4 respectively. A marked increase in hotels, restaurants and shops has occurred in Labuan Bajo since the late 1980s. In Sape, the establishment of shops has been more gradual, although the development of restaurants has accelerated since 1988. It is evident that Labuan Bajo has experienced a phase of rapid development in recent years. That this is solely due to the rise of tourism to KNP is unlikely, although the two are undoubtedly linked.

Figure 8.3 The development of Local Enterprises in Labuan Bajo



Figure 8.4 The Development of Local Enterprises in Sape.



However, care must be taken in interpreting this data, since it only presents information on existing enterprises and not those that have closed during the same period. It may be that the apparent rise in development is actually an artefact created by the short lifespan and rapid turnover of individual businesses. Despite this caveat, there has undoubtedly been a period of considerable population growth in both Sape and Labuan Bajo over the past ten years (Sudibyo, 1995b). Most rapid growth has been witnessed in Labuan Bajo, the administrative centre of Komodo Subdistrict. Much of this has been in association with the development of transport infrastructure, namely an airstrip, ferry terminal and harbour for larger vessels.

8.3.4 The Style of Local Development

- **Hotels**

In Sape, the traditional types of hotel and restaurant still prevail. The dependence of these sectors on tourism is less than their equivalents in Labuan Bajo, and it is unlikely that their development has been greatly affected by tourism.

In Labuan Bajo, it is clear that new styles of accommodation and restaurant are emerging in response to tourism demand. The data from hotels regarding bed nights in Labuan Bajo were not comparable due to differences in the quality of records between establishments. As such a quantitative assessment of distribution would be unreliable. However, a number of observations were made.

The traditional losmen and homestays in Labuan Bajo receive very few foreign visitors. Most stay in Class B, tourist hotels. Whilst some independent travellers prefer to pay as little as possible and stay in traditional accommodation, most prefer to pay a little more for a higher level of comfort. Amongst the Class B hotels, a number of factors affect visitor choice. Guide book and personal recommendations are particularly important (*pers.obs.*), and these in turn are based upon quality and location; the more popular establishments are those offering better facilities (Class B as opposed to 1B) or a better location (island resorts and hillside locations within the town). Price differences are small and price plays only a small part in visitor choice; those staying in cheaper Class 1B accommodation were often there because more preferable establishments were full (*pers.comm.*).

The more luxurious Class A hotels do not appear to have established themselves. Although four are listed in local government records, only one remains open as of August 1996, suggesting that the development of higher cost, luxury facilities in Labuan Bajo was premature. The town remains essentially an independent, budget traveller location.

- **Restaurants**

The restaurants in Labuan Bajo display a greater diversity of menus than those in Sape, which all serve different forms of Indonesian cuisine. Although the majority of restaurants in Labuan Bajo serve Indonesian styles, four serve a heavily Chinese-influenced menu, and two include overtly European cuisine. Many more now serve western style drinks, such as milkshakes.

There was a bimodal distribution of responses regarding the proportion of customers who were tourists. The distribution was clearly divided between those restaurants for which <35% of customers were tourists (n=13), and those for which >55% of customers were tourists (n=12). This provides a convenient division of the sample into those establishments 'favoured' by tourists and those which are not.

Bivariate statistics were employed to test for significant differences between the two groups identified above with regard to six other variables. 1-way ANOVA and Pearson's Chi-squared tests revealed the groups to be significantly different with regard to all variables (Table 8.3). Members of the group with the higher percentage of tourist customers had a greater number and frequency of tourist customers, a greater income and a greater price per meal. They were also more likely to serve foreign-influenced cuisine. The group contained all the restaurants associated with hotels and four other independent restaurants. These results suggest that the most successful restaurants with regard to capturing tourism revenue are those associated with non-traditional development. Conversely, it was found that members of the group with the higher percentage of tourist customers were more likely to be locally owned, although this finding is regarded as suspicious since a number of restaurants in hotels known to be non-locally owned were stated to be locally owned by respondents.

Table 8.3 Characteristics of Two Groups of Restaurants Defined by the Proportion of Customers Who Were Foreign Tourists.

Variable	Group 1 (<35% of customers tourists)	Group 2 (>55% of customers tourists)	Probability
	Continuous Variables (mean)		
Annual Number of Customers	702	6793	0.0001
Annual Income (Rp1000s)	5525	23042	0.01
Cost per meal (Rp)	1396	3642	0.01
	Categorical Variables (median/mode)		
Frequency of tourist clients	weekly	daily	0.01
Style of menu	Indonesian	foreign-influenced	0.01
Origin of Owner	non-local	local district	0.01

8.4 Tourism-related Employment

Traditional livelihoods around KNP have been based upon primary production, principally fishing with a small amount of agriculture. Fishing is carried out by the immigrant Bugis and Bajau people, whilst the native Bima and Manggarai people are primarily farmers. The towns of Sape and Labuan Bajo have become market centres for marine and agricultural produce, and a trading community has developed in these centres. There are relatively complete public facilities and government offices in Labuan Bajo, and to a lesser extent in Sape. As such, employment in the business sector and the civil service has become available to educated sections of the community (Sudibyo, 1995b).

Tourism has provided additional employment opportunities, notably in the charter boat sector and in service enterprises (hotels, restaurants). The former is a direct extension of traditional marine livelihoods, whilst the latter is an extension of the development of town-based business opportunities as described above. Surveys of local businesses revealed the number of employees in each sector (Table 8.4). A total of 420 jobs in Labuan Bajo and 154 jobs in Sape were partially dependent upon tourism. If the proportional dependence of each sector upon foreign tourism is taken into account, then a hypothetical figure of 256 'full-time equivalent' jobs in Labuan Bajo and 65 in Sape were supported by tourism.

In Kampung Komodo (Fig.8.5), 23 jobs were created by tourism. Of these, 17 consisted of wooden dragon carvers (Fig.8.6), and six were boat crew on the shuttles between the government ferry and Komodo Island (Chapter 3). Irregular employment in KNP as visitor guides and porters on guided trails amounted to a further 'full time equivalent' job. Overall, only 7% of local tourism-related employment was generated in Kampung Komodo.

The largest amount of employment (c.42%) is in the charter boat sector of the economy (Table 8.4). Restaurant and hotel employees comprise a further 39%, whilst other employment accounts for 19% of the total.

Most employees in the tourism sector were male. Whilst there are no opportunities for female employment in the charter boat sector, between 36% (Labuan Bajo, n=50) and 55% (Sape, n=22) of hotel and restaurant employees were female. The average age of female employees was 23 (n=30) whilst that of males was 27 (n=42). Amongst charter boat employees, the average age of captains was 32 (n=10), whilst that of crew was 23 (n=17). Given that the average age of respondents to the local attitude survey was 39.5, with a range from 20-70 (Chapter 9), these results suggest that tourism employment opportunities fall mainly to the younger members of local communities.

Table 8.4 Estimates of Tourism-Related Employment in Different Sectors of the Local Community (based on local surveys).

	Total number of jobs in tourism	Number of 'full time' jobs in tourism	Proportion of total 'full time' jobs in tourism (%)
Hotels	79	70	20.3
Restaurants	161	65	18.8
Charter Boats	179	145	42.0
Shops	146	30	8.7
Other ⁵	53	35	10.1
Total	618	345	100.0
Labuan Bajo	420	256	74.2
Sape	154	65	18.8
Kampung Komodo	44	24	7.0

⁵ including Labuan Bajo tour guides and jobs created in Kampung Komodo.

Figure 8.5 Kampung Komodo is a Traditional Fishing Village With No Tourist Infrastructure.

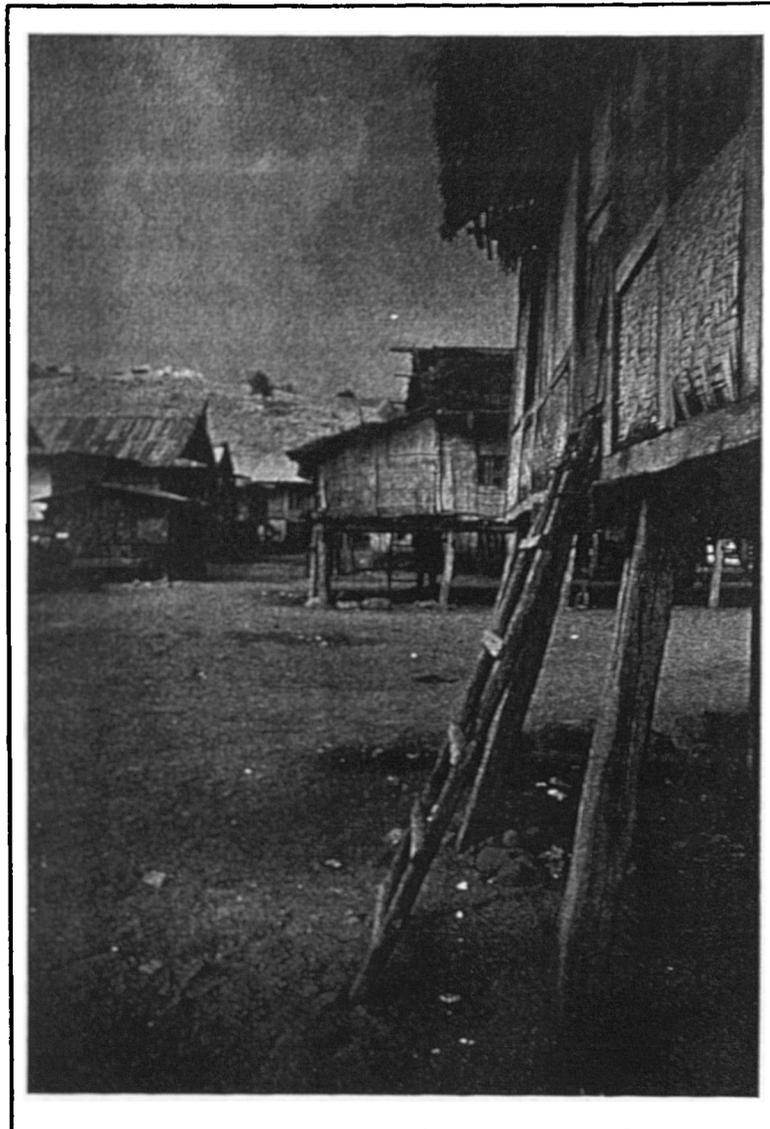
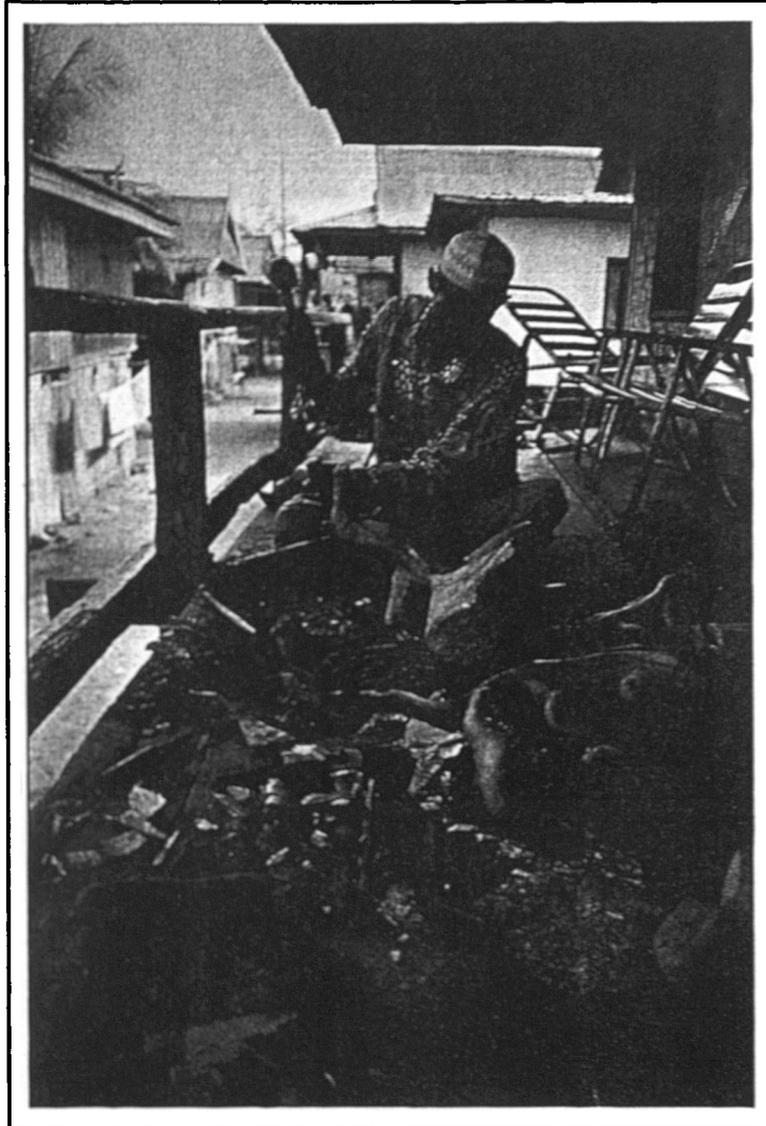


Figure 8.6 A Wooden Dragon Carver in Kampung Komodo.



The types of employment available in tourism are principally menial, such as boat crew, waiting in restaurants and domestic duties in hotels. Some limited opportunities for more skilled employment (chefs, boat captains, craftsmen, guides) also exist, although senior positions in tourism businesses are rarely filled by locals. 94% of shop owners in Sape were from within the local district (n=16), compared to 46% of restaurant owners (n=13). In Labuan Bajo, only 28% of shops and restaurants were locally owned (n=47). Most employees in tourism have not received any additional training or education beyond secondary school. A minority of hotel and restaurant staff speak some English or other foreign language and, rarely, an employee may have attended a tourism school in Bali or Kupang. Many simply enter the industry on leaving school.

The average monthly wage of hotel and restaurant employees in Labuan Bajo was Rp65,300 (approximately US\$28) (n=113, range=US\$13-US\$52). By comparison, the average basic monthly wage amongst KNP junior staff was US\$76 (n=78, range=US\$55-US\$99). This suggests that jobs in the tourism sector are not well paid. However, salary may not be a reliable indicator of income since other, invisible benefits such as accommodation and meals also flow to employees.

Patterns of employment within businesses also appear to change as tourism develops. In Sape, businesses are predominantly family-run. 59% of shop employees (n=51), and 64% of hotel and restaurant employees (n=51), are related to the owner of the business. In Labuan Bajo, only 41% of shop employees (n=95) and 50% of hotel and restaurant employees (n=135) are related to the owner.

8.5 Tourism-Related Revenue

8.5.1 Revenues Generated in Each Community

The flow of benefits to local people reflects the geographical inequalities of visitation and contact with foreign visitors between localities. Approximately US\$1.25 million was spent by tourists in the local communities surrounding KNP in 1995/96 (Table 8.5). 99% of this was spent in the two gateway towns of Labuan Bajo (82%) and Sape (17%). Only 1% of this expenditure accrued to people living within the park. Opportunities for revenue generation from tourism in Kampung Komodo are essentially limited to two options, both generating around half of the total tourism-associated revenue in the village. One is the shuttle service from the government ferry to the visitor camp on the island. The other is the sale of carved wooden statues of dragons. A small amount is also generated by casual employment in KNP. The cessation of dragon provisioning at Banu Nggulung (Chapter 6), by removing the market for goats, has effectively reduced the benefits to the village by one third.

Table 8.5 Estimates of Tourist Spending in Labuan Bajo, Sape and Kampung Komodo, 1995/96.

Sector	Tourism Revenue (US\$)				% of Total
	Labuan Bajo	Sape	Kampung Komodo	Total	
Hotels	146,000	3,500	0	149,500	11.94
Restaurants	178,000	22,500	0	200,500	16.01
Charter Boats	407,000	149,000	0	556,000	44.39
Shops/Goods	200,000	3,000	5,600	208,600	16.65
Transport	92,000	39,000	6,100	137,100	10.95
Other	-	-	900 ⁶	900	0.07
Total	1,023,000	217,000	12,600	1,252,600	
% of Total	81.7	17.3	1.0		100.0

⁶ *irregular employment as porters and guides in KNP.*

8.5.2 Distribution of Revenue Between Sectors

The largest amount of visitor spending locally was in the charter boat sector (c.44% of revenue, Table 8.5). Charter tours are the most expensive item purchased by visitors, and, by their association with KNP, are often the major attraction of a stay in the area. They also provide access to beaches and snorkelling sites. For package tourists on organised tours, the charter boat from Sape is their only contribution to the local economy (Section 8.5.5). Restaurants and retail purchases account for almost one third of tourist expenditure in the local economy. Hotels and public transport contribute a further 10% each.

The visitor questionnaire in Labuan Bajo revealed that the average expenditure per visitor was approximately US\$90 during a three day/night stay in August 1996 (Table 8.6). Over a third of this (US\$34) was spent on charter boat tours. Around two fifths (US\$38) was spent on accommodation and meals/drinks. Visitors spent approximately US\$4.50 on accommodation per night, a similar amount on food per day, and approximately US\$3.80 on drinks per day (of which US\$2 was spent on alcohol, principally beer). A further US\$8 was spent on souvenirs, and US\$10 on public transport. There was little variation in spending within each category except for souvenirs and charter boats, the latter reflecting the fact that some visitors may pay \$100 for a passage to Lombok whilst others may not use charter boats at all. The overall estimate of expenditure in Labuan Bajo derived from the tourist questionnaire results was remarkably similar to that derived from local business surveys (Appendix Table C.8).

Table 8.6 Visitor Questionnaire Results: Spending Patterns of Tourists in Labuan Bajo.

	Daily Spend (US\$)				Total Spend (US\$)			
	Room	Meals	Drinks	Alcohol	Souvenirs	Bus/Taxi	Ferry	Tours
MEAN	4.52	4.38	1.79	2.02	8.39	2.52	7.72	33.94
MAX	13.00	13.00	4.33	8.67	86.66	16.90	43.33	129.98
MIN	1.30	0.87	0.00	0.00	0.00	0.00	0.00	0.00
sd	2.09	2.13	1.04	1.86	15.29	3.19	9.39	34.89
95% CI	±0.29	±0.29	±0.15	±0.36	±3.31	±0.63	±2.36	±6.12
n	208	201	190	101	82	97	61	125

8.5.3 Distribution of Revenue Within Sectors

It was noted in Section 8.3.4 that there was an uneven distribution of tourism patronage of hotels and restaurants, leading to inevitable differences in revenue between businesses. This section examines distribution of charter boat visits to KNP between locally owned and non-locally owned boats, and amongst locally-owned boats.

There is a very uneven distribution of visits to KNP amongst Labuan Bajo charter boats running day and overnight tours to the park. Of 27 boats recorded as having visited the park in 1995/96, four account for 59.0% of all visits, and ten account for 85.7% (Fig.8.7). The effective size of this sector is smaller than a simple inventory of boats would suggest, with a small number of vessels dominating the market.

Of the 115 recorded visits to KNP by boats running charter tours between Lombok and Labuan Bajo between May and August 1996, half were from Lombok and half from Labuan Bajo. Of the eight recorded from Labuan Bajo, one was responsible for 32.7% of visits, and three were responsible for 65.5% of visits (Fig.8.8). This too suggests a smaller core to the sector than the inventory implies.

Amongst Sape charter boats, those that visit most frequently are owned by two Bima-based tour operators. Local co-operative boats, constituting 55.6% of charter boats from Sape, only supplied 34.1% of the tours to the park between May and August 1996 (Table 8.7). This suggests that local boats independent of tour operators are benefiting less than boats owned or contracted by tour operators.

Table 8.7 Distribution of Sape Charter Boat Visits to KNP Between Operators, May - August 1996

Organisation	Number of Visits	% of total	Number of boats	mean visits/boat
Parewa Tours	95	44.4	4	23.8
Grand Komodo	46	21.5	2	23.0
Co-operative	73	34.1	5	14.6

Figure 8.7 Frequency of Visits to Rinca Island by Labuan Bajo Charter Boats.

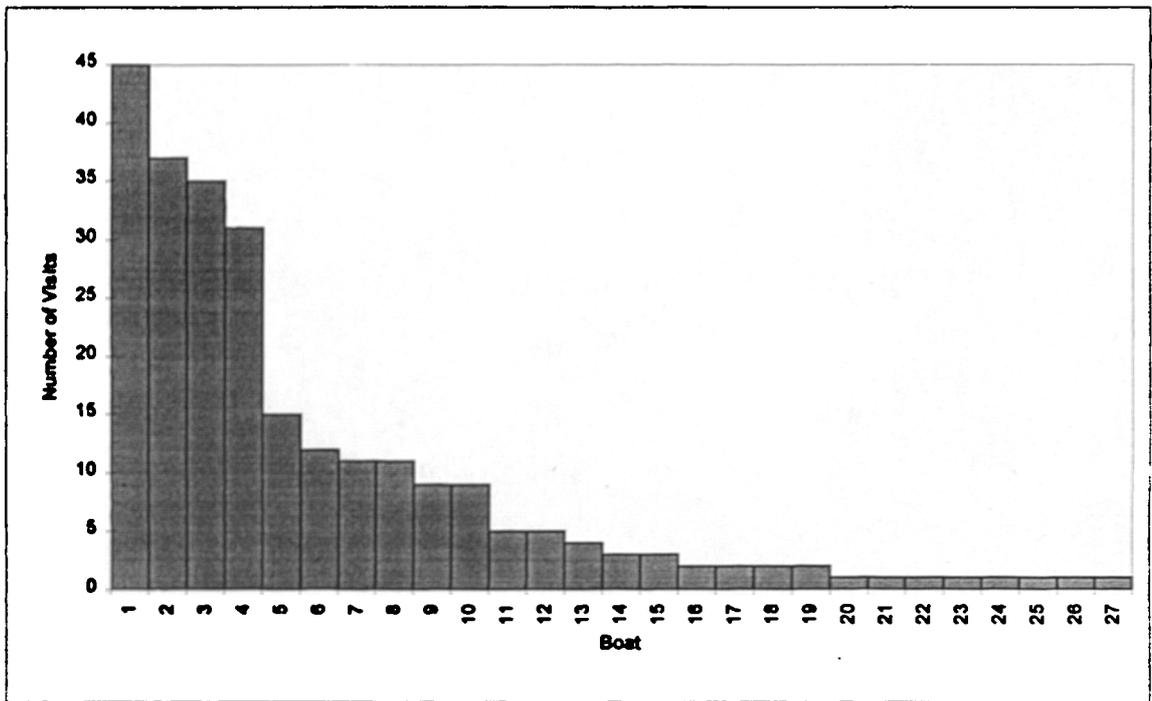
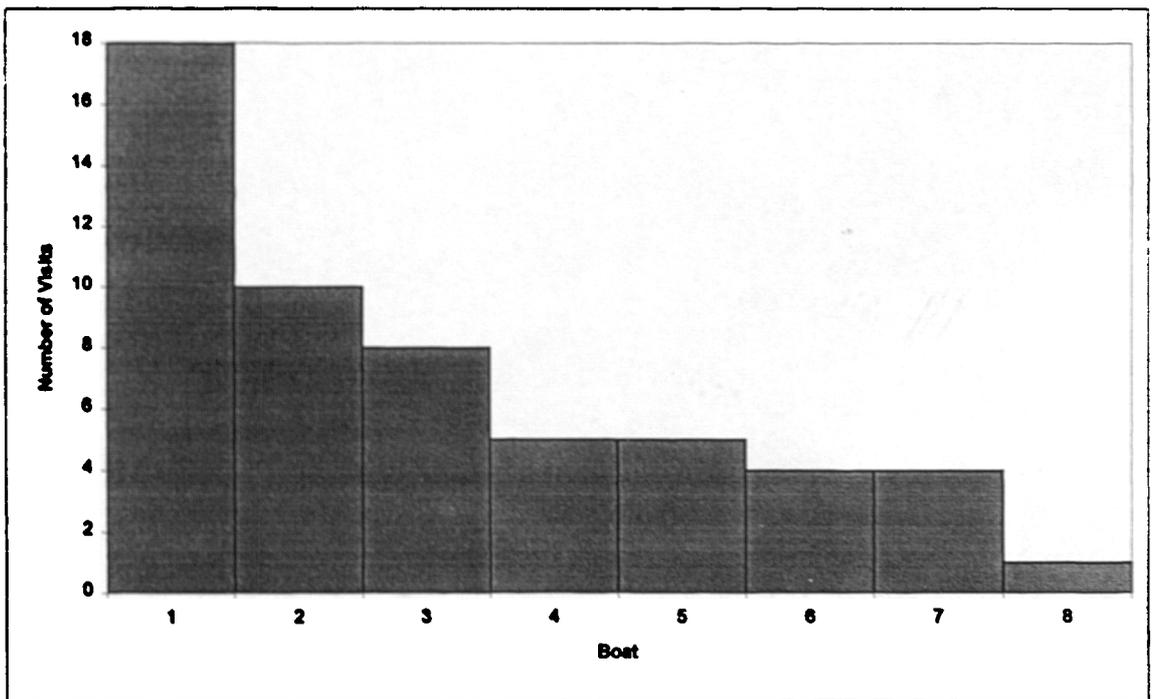


Figure 8.8 Frequency of Visits to Komodo Island by Labuan Bajo Charter Boats Running Tours Between Labuan Bajo and Lombok.



8.5.4 Leakages

Leakage of revenue from the local economy is related to the magnitude of import of goods from outside the region, and the level of non-local ownership of tourism-related enterprises. Leakages are difficult to estimate since comprehensive data is almost always lacking. In this study estimates were made for each sector except for hotels where no reliable data could be collected. Estimates of leakage which have been made are presented with some caution regarding accuracy. However, it is likely that they represent underestimates of total leakage since they only take into account import of goods and services, and not leakages associated with infrastructural or running costs.

In the local economy surrounding KNP, at least 50% of all visitor expenditure is estimated to be lost as leakage (Table 8.8).

Table 8.8 Estimates of Leakage of Tourism Revenue From the Local Economy, 1995/96.

Sector	Estimated Revenue (US\$)	Estimated Leakage (%)	Revenue Remaining (US\$)
Hotels	149,500	unknown	149,500
Restaurants	200,500	20	160,000
Charter Boats	556,000	58	233,000
Shops/Goods	208,600	60	87,000
Transport (bus, ferry, etc.)	137,100	93	9,000
Casual KNP employment	900	0	900
Total	1,252,600		639,900

- **Restaurants and Shops, and Hotels**

Restaurants purchase their supplies from local shops and wholesalers. However, other than fresh produce (fish and some fruit), everything is imported from outside the local area. In particular, bottled water, beer, cigarettes, postcards and T-shirts come from Java. Biscuits and packaged goods, and some 'local' souvenirs are also manufactured outside the local districts.

Data from the Komodo Koperasi suggest that approximately 60% of revenue from retail sales to visitors (including drinks) is spent on goods imported into the local area. This would suggest that 60% of shop purchases leaks from the local economy, and 60% of drinks and

packages goods bought in restaurants leaks from the local economy. This approximates to 20% of restaurant revenue, although the figure will vary depending on the type of restaurant.

Leakages from the hotel sector are likely to be small, since employment, linen and furniture can all be sourced locally. However, no reliable estimate could be made.

- **Charter Boats**

Of charter boats from Sape, some are locally owned and part of a co-operative, and some are owned by external companies. Of charter visits to Komodo Island during the summer of 1996, 141/214 were made by boats owned by external companies (Table 8.7). This suggests that 66% of revenue to Sape charter boats is diverted from the local economy. Of charter boats operating out of Labuan Bajo, a number are from Lombok. Calculations based upon relative numbers of passengers and relative fees suggest that 54.2% of revenue to charter boats operating out of Labuan Bajo is diverted from the local economy. Overall, an estimated 58.% of charter boat revenues passes out of the local economy. ⁷

- **Transport Services**

Ferry fares accrue to the government and the national carrier (PT Peln). Buses and taxis are owned and operated from outside the local community, and only a very small percentage of a few salaries from this revenue will accrue to the local economy (c.US\$1,000). The only direct impact is the revenue to local short-distance public transport services, namely horse carts in Sape (US\$1,000), 'bemos' in Labuan Bajo (US\$1,000), and the shuttle boats from Kampung Komodo (US\$6,100). This amounts to approximately US\$9,100. Thus an estimated 93.4% of public transport spending by tourists to KNP does not accrue to the local economy.⁸

- **Leakage from Kampung Komodo**

It is interesting to note that leakage from revenue generating activities in Kampung Komodo are negligible, since they are based upon the provision of labour and hand-made products. Whilst the ownership of the shuttle boats appears to be held by Sape residents, much of the revenue is still retained by the village, and all remains within the wider local economy embracing the rural population bordering the park.

⁷ however this does not take into account the destination of wages paid to employees.

⁸ there will be some additional spending by carriers in the local community which will offset some of this leakage, but the contribution will be small.

8.5.5 Bypasses - The Relative Contribution of Different Tourist Types

The average cost per trip of different types of visitor presented in Table 8.9 are not entirely comparable, given that the point of departure of different trips is not universal. However, they do give an indication of the relative contributions of different types of visitor and the magnitude of tourist spending on trips to KNP which bypasses the local economy. Package tours fulfil the sole function of providing a visit to the park in the minimum amount of time, but with a certain (fairly basic) level of comfort. As such, the full cost of a trip from Bima has been considered as expenditure relating to a KNP visit. Only 17.5% of revenue from this source accrues to the local economy, by means of boat hire (although much of this leaks out again, Table 8.8). Cruise trips, whilst advertised principally for their inclusion of KNP on the itinerary, do fulfil other recreational functions (multiple destinations, luxury service, etc.). As such it may be inaccurate to imply that the total expenditure on cruise tours from Bali is contingent upon the inclusion of KNP on the itinerary. Nevertheless, it remains true that cruise passengers visiting KNP spend over US\$6.5 million for the privilege, of which almost nothing accrues to the local economy.

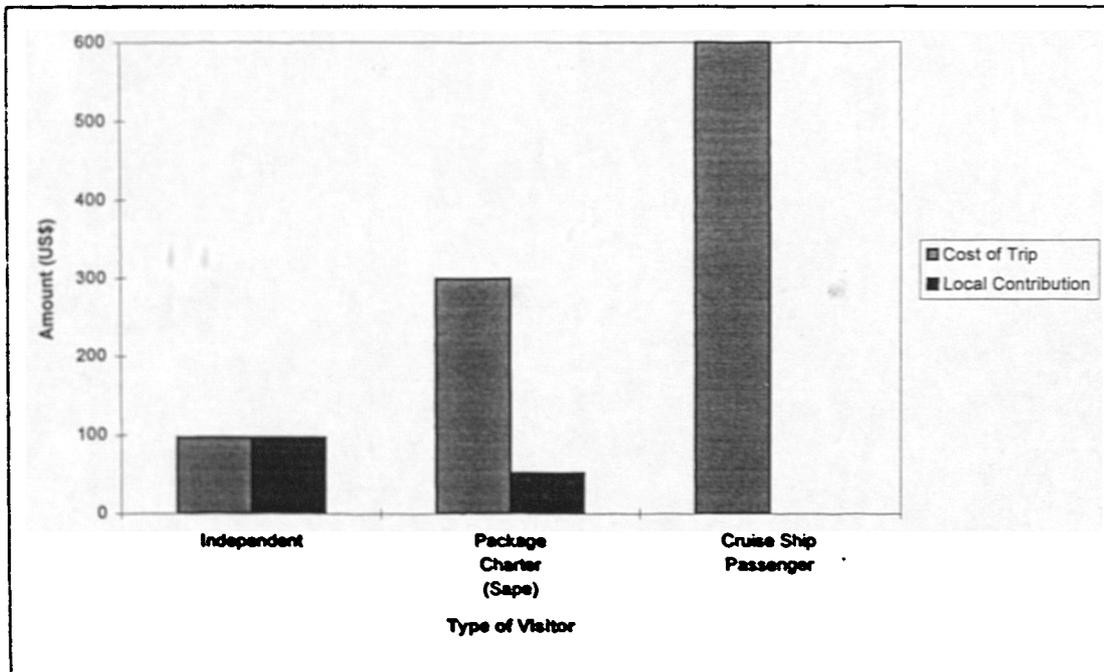
At the other extreme independent tourists, once they have arrived in the region, spend all their money locally although, as already highlighted, a substantial proportion leaks out again. In total, only 14% of total expenditure by visitors on a trip to KNP accrues locally (Table 8.9), which reduces to 7% or less when leakages are taken into account (Table 8.8).

The amount of tourism spending based on KNP which bypasses the local economy is substantially greater than that which accrues to it. In addition, there appears to be an inverse relationship between average spend on a visit to KNP and average contribution to the local economy (Fig.8.9). The less affluent, independent visitors, demanding a lesser level of comfort and service, provide a greater contribution to the local economy than the more affluent travellers seeking higher levels of comfort and service. This is similar to the relationship between type of visit and contribution to KNP identified in Section 7.3.5.

Table 8.9 Distribution of Tourist Spending by Type of Tourist.

Tourist Type	Mean Cost of Trip (US\$)	Total Expenditure (US\$)	Total Local Expenditure ⁹ (US\$)	Mean Local Expenditure per Visitor (US\$)	Proportion of Total cost of Trip Spent Locally (%)
Cruise	600	6,763,200	388	0.03	0.01
Package	300 ¹⁰	1,032,000	180,450	52.46	17.49
Independent	97 ¹¹	1,071,727	1,071,727	97.43	100.00
Total	345	8,866,927	1,252,565	48.72	14.13

Figure 8.9 Cost of Visit to KNP Compared With Financial Contribution to the Local Economy Surrounding KNP, for Different Types of Visitor.



⁹ before consideration of leakages.

¹⁰ not including transport to the region.

¹¹ not including transport to the region.

8.6 Discussion

8.6.1 Tourism Development in Local Communities

Between Labuan Bajo, Sape and Kampung Komodo there are differences in the level of infrastructural development and the scale of the tourism sectors of the economy, from relatively high to almost non-existent. This pattern is reflected in the volumes of tourist visitation to each of these locations. The majority of visitors who come into contact with the local communities do so in the gateway of Labuan Bajo. There is minimal contact between visitors and inhabitants of KNP.

Increased levels of contact are associated with increasingly modern and foreign styles of development. It is clear that Labuan Bajo in particular is being viewed as the next potential focus for development by the tourism industry in Indonesia, which is gradually extending east of Bali. This will further compromise the ability of local people to control and capitalise upon the development and commercialisation of their environment.

8.6.2 Tourism-related Employment

Over 600 jobs in local communities are partially supported by tourism-related revenue, with most opportunities associated with Labuan Bajo. Opportunities appear to be greater for the younger members of the community. In addition, the roles which they adopt are usually subordinate, semi-skilled, and require little by way of formal education beyond basic schooling. In some ways the involvement of local people is determined by their existing skills and capacities; seafarers are equipped to become involved in the charter boat sector whilst traders and entrepreneurs are developing their businesses to encompass tourism. The latter is happening more rapidly in Labuan Bajo as a result of the larger contact with tourists there. However, as the results in Section 8.5.3 show, even in Labuan Bajo only a few are able to capitalise fully on tourism.

Training and skills transfer appears to be limited. Some hotel and restaurant employees speak English or (rarely) other foreign languages, and some have undertaken specific tourism training, but this is by no means universal. Wages are comparatively low, although in some cases salary is not a reliable indicator of income, since other, invisible benefits, such as accommodation and food, also flow to employees.

Senior positions in tourism-related enterprises are rarely open to local people, mainly due to a lack of capital to invest in a business. This situation is not unusual, and is not uncommon in the traditional fishing industry either. The large capital investment necessary for specific forms of fishing, and for transport vessels, has resulted in many local fishermen working as hands on boats owned by external entrepreneurs, or borrowing heavily from creditors to run their own boats (Sudibyo, 1995b). Similarly, of the restaurants in Labuan Bajo, only 28% are owned by people from Manggarai Regency, the rest being owned by Javanese and other non-local entrepreneurs. The same is true of restaurants in Sape, with just under half of the owners from Bima and the rest from further afield. There appears to be heavy investment from outside the Province in the charter boat industry, and in the development of new, higher class hotels and beach resorts. It is also apparent that large areas of waterfront land in Labuan Bajo are being bought up by external investors in anticipation of an expansion of tourism development in the region.

The development of retail and service sectors of the local economy have provided new opportunities for female employment in more visible roles than the traditional gender roles which predominate within local fishing communities (Sudibyo, 1995b). Some of these opportunities are related to the expansion of tourism. As mentioned above, between 36% and 50% of employees in restaurants are female, and the same ratio is anticipated for local shops. However, only two out of 38 'tour guides' in Labuan Bajo were female. The impact of tourism development, or any other development, on gender roles is difficult to ascertain when the hidden roles of women in society are not fully understood. In the same way that salaries are not always a good indicator of material benefits from employment, the sex ratio of visible employment is not necessarily a good indicator of female involvement in an industry or business. This kind of inquiry demands extensive field research in the form of household surveys and investigations, which was beyond the scope of this project.

8.6.3 Revenue, Distributional Issues and Leakages

Estimates indicate that over US\$1.25 million accrues to the local economy, and over 600 jobs appear to be partially supported in tourism-related businesses. However, there are a number of distributional issues which have also been highlighted in this chapter. Of particular importance is the lack of opportunities for people living within KNP to benefit from tourism. 99% of revenue to the local economy, and 93% of employment opportunities, accrues to

neighbouring town communities, and not to those communities living within KNP who are most disadvantaged by restrictions over resource use.

Within the different sectors of the economy relating to tourism there is considerable distributional inequality. Modern developments, and those catering to foreign tastes, have a competitive advantage, as do those operated by larger external entrepreneurs. For example, although there are many small, local outlets serving food, most tourist custom accrues to the hotel restaurants and to a small number of independent restaurants which cater specifically for the tourist market. These restaurants charge higher prices, provide more westernised menus and are often situated in panoramic, sunset locations.

Tourism to KNP clearly generates large inputs into the local economy, although the lack of linkages with traditional production sectors have resulted in large leakages. At least 50% of revenue leaks out of the local economy as a result of imports and non-local involvement in the local tourism industry. Tourism is a tertiary industry, which is developing in an area where the dominant industry has been primary, i.e. fishing and farming, without the development of intermediate secondary industries. Tourism relies on secondary, manufacturing industries for the supply of processed and packaged retail goods, and for much of its infrastructure. The absence of such industries locally, and the lack of linkages where they do exist, accounts for much of the leakage which is witnessed.

Approximately 85% of tourist expenditure on a visit to KNP bypasses the local economy due to the dominant involvement of non-local carriers and package tour operators in the market. Currently, the cruise ship sector of the tourist market based upon KNP is essentially an enclave development. Visitors are completely isolated from the surrounding local community in a self-sufficient, exclusive environment which denies local people the opportunity to benefit. The same is true of most package tourists using charter boats from Sape. As a result, a paradoxical situation occurs whereby the most affluent visitors to KNP contribute the least to the local economy.

9. Local Attitudes Towards Tourism

9.1 Introduction

Ecotourism aims to improve local benefits from protected areas to offset the opportunity costs incurred by local people. As this process occurs, a key assumption is that local people will become more satisfied and, in particular, less antagonistic towards conservation efforts (Goodwin, 1996). In contrast, much of the tourism development literature postulates that local people become *less* satisfied as development increases, and that an initially positive attitude towards tourism may be replaced by apathy and antagonism (Doxey, 1975). Essentially this is a difference between the ideology of sustainability and the reality of development. Both conditions are generalisations, and within a community attitudes are likely to vary (Dogan, 1989).

The previous chapter presented a picture of the interaction of tourism with the local economy based upon the measurement of revenue and employment generation. Whilst this type of analysis is rare in developing countries, an assessment of local attitudes towards tourism is even more rare (Wall, 1996). However, since the emphasis of sustainable development, and of integrated conservation and development, is on improving local conditions, it would seem prudent in any evaluation to discover what local residents themselves think.

What follows is an attempt to elucidate the attitudes and opinions of local residents regarding the development of tourism and the arrival of foreign visitors in their communities. The following are the major areas of inquiry;

- What is the scale and type of contact between local people and tourists?
- How dependent are local families on tourism for income?
- How positively do local people view tourism?
- How do local people perceive the distribution of benefits from tourism?
- How do local people perceive the economic cost of tourism?
- How do local people perceive the cultural impacts of tourism?

Three issues are of particular interest. Firstly, the differences in contact, dependence and attitude between the gateway towns and the island village of Kampung Komodo within KNP.

In the absence of time series data for a single location, the differences in volume and development of tourism in these three locations provides a natural experimental situation with which to examine how attitudes change with development. Secondly, the differences in attitude between those who benefit from tourism and those who do not. It has been suggested that an initially homogenous community attitude towards tourism becomes more heterogeneous as the benefits of development favour some sectors of the community and not others (Dogan, 1989). Thirdly, the difference in attitude between the younger and older generations. The changes which tourism brings to a destination are likely to be more apparent and less palatable to the older generation rather than those who are growing up with it (Andronicou, 1979).

Section 9.2 presents the methodology for the chapter. The results are divided into three sections. Firstly, the results of a survey of local adults is presented (Section 9.3), followed by the results of a survey of local children (Section 9.4). The results of the two surveys are compared in Section 9.5. The chapter ends with a summary of key themes (Section 9.6).

9.2 Methodology

Questionnaire surveys are increasingly used in developing countries as a rapid tool for examining local attitudes towards protected areas (Balakrishnan and Ndhlovu, 1992; Newmark *et al.*, 1993; Mkanda and Munthali, 1994; Nepal and Weber, 1995) and tourism (Ap *et al.*, 1991; Wall, 1996). In the context of this research, the questionnaire approach was deemed appropriate because it could be implemented rapidly, with little expense, and by local researchers with the minimum of training and instruction (see Chapter 4).

Two questionnaires were administered to local people in Labuan Bajo, Sape and Kampung Komodo. For each questionnaire, twice as many respondents were selected in Sape and Labuan Bajo as were selected in Kampung Komodo, whilst sexes were sampled equally in all three sites. The first questionnaire was administered to local adults. In an effort to impose random sampling, interviewers visited residential areas in each location and interviewed one occupant from every other dwelling encountered. Alternate male and female respondents were chosen. The second questionnaire was administered to children between the ages of 6 and 18 in the three study sites. Interviewers patrolled the main street and residential areas of each site and selected alternate male and female respondents. Where possible, every fifth child encountered was selected for interview, in an effort to impose random sampling.

The surveys began with questions to elicit demographic and socio-economic data. Respondents' age and sex were recorded, along with place of birth divided into local subdistrict, local district, province and elsewhere. Adult respondents were asked their occupation and the number of their children. Child respondents were asked whether or not they attended school. Both adult and child respondents were asked to state whether or not they had talked to, sold goods to, acted as a guide for or provided other (unspecified) services for tourists. Adult respondents were also asked to state whether or not their families were dependent (partially or completely) upon tourism for income, whilst child respondents were asked whether or not they had ever received money from tourists.

A series of dichotomous (yes/no) questions were asked regarding respondents attitudes and perceptions of tourism (see Table 9.4). The majority of these were posed as statements to which respondents were asked to agree or disagree (after Nepal & Weber, 1995). Some of these were general attitude questions designed to elicit respondents overall attitude towards tourism and KNP. Some were questions regarding the distribution of benefits at the community and family level, whilst some examined perceptions of cultural impact. Perceptions of the economic cost of tourism were examined by asking respondents about price rises in association with tourism.¹

Three of the four dichotomous 'contact with tourist' variables were amalgamated into a point scale variable for analysis (Section 9.3.2). One point was scored for each type of contact with tourists experienced (talked with, sold goods to, provided other service for). The question regarding guiding tourists received too few 'yes' responses to be useful and so was omitted.

The dichotomous attitude questions were amalgamated into a point scale variable for analysis (Section 9.3.3). Of thirteen such questions, twelve were classified as positive or negative statements and included in the scale, whilst a thirteenth was judged to be ambiguous and omitted from further analysis.² Agreement with positive statements and disagreement with negative statements were scored +1, while agreement with negative statements and disagreement with positive statements were scored 0. The range of scores was divided into three categories; low (0-4), medium (5-7) and high (8-12). Respondents with high and low

¹ inflation is viewed by Lindberg & Enriquez (1994) as the primary economic cost of tourism at the local level.

² the statement 'tourists come here because of KNP' is neither positive nor negative with regard to tourism or conservation.

scores were considered to have positive and negative attitudes towards tourism respectively, whilst those with a medium score were considered to be indifferent. Analysis was conducted using both the ordinal score variable and the categorised variable.

Data were initially screened for deviations from normality. No univariate outliers were found, although nine within-groups multivariate outliers were identified during screening for discriminant function analysis (Section 9.3.3). Five of these were particularly old respondents, whilst four were respondents with particularly large families. All were omitted from subsequent analysis. Severely uneven distributions amongst some categorical variables were also found. The question regarding dependence of family on income from tourism only yielded three 'totally dependent' responses. These were combined with the 'partially dependent' responses to form a dichotomous variable with regard to dependence upon tourism (not dependent vs. dependent). Questions regarding occupation and spouse's occupation yielded 20 categories of answer, with a very uneven distribution. After consultation with a local counterpart these were recoded into six occupational categories and a seventh 'retired' category. The categories were; fishermen, farmers, skilled labourers, traders/businessmen, professionals (including government officials) and housewives. The combined attitude score was found to be positively skewed. A reflected logarithm transformation improved the approximation of the distribution to normality. Both transformed and untransformed variables were used in subsequent analysis, but with little difference in results.

For both questionnaires, descriptive statistics are given for the entire sample and split by location. Bivariate statistics (Chi-squared and 1-way ANOVA) were used to examine relationships between socio-economic variables, and to examine factors affecting experiences of and attitudes towards tourism. Multiple regression and discriminant function analysis were used to construct predictive models regarding local attitudes towards tourism.

Stepwise multiple regressions were used to determine which linear combination of variables best predicted the attitude scores of adults and children. All socio-economic variables were included in the analyses, along with the score for contact with tourists. For the analysis of adult responses, the 'dependent upon tourism' variable was included, whilst for the analysis of child responses, the 'received-money' variable was included.

Discriminant function analysis was used to determine which linear combinations of variables best separated positive, neutral and negative adult attitudes, using the same variables as above. The categorical occupation variable was divided into three dummy variables for fishermen, traders (the two most common categories) and a combined 'other occupation' variable, all compared against a baseline occupation of housewife.

Table 9.1 Breakdown of Questionnaire Respondents by Sex and Location.

Location	Adult Questionnaire			Child Questionnaire		
	Male	Female	Total	Male	Female	Total
Labuan Bajo	98	102	200	44	44	94 ³
Sape	95	106	201	50	50	100
Kampung	50	50	100	25	25	50
Komodo						
TOTAL	243	258	501	121	117	244

A total of 501 adult questionnaires and 244 child were completed, according to the schedule in Table 9.1. However, initial screening revealed that the data from Kampung Komodo showed almost total homogeneity of positive responses throughout the sample. A number of causal factors may have contributed to this result;

- respondents may have given 'expected' answers, i.e. those which they believe the interviewer wanted to receive.
- respondents may have associated interviewers with the park authorities and, through fear of reprisals or otherwise, given 'correct' answers which reflect well on the park and its policy.
- respondents may have given the 'communal' answer, i.e. expressed that opinion which is held by the headman (*Kepala desa*) of the village.

The first and second explanations invoke cognitive processes as the causal factor for the pattern of response. Both scenarios are credible given the parameters within which the survey was carried out. However, an Indonesian research assistant suggested the third reason above as the probable explanation for the data (Muhidin, *pers. comm.*). Whatever the reason, this data is unusable for statistical comparisons. The remainder of the data presentation and

³ six cases were not classified by sex

analysis is therefore restricted to respondents from Sape and Labuan Bajo. A total of 401 responses to the adult questionnaire and 194 responses to the child questionnaire were collected from these two locations, split equally between location and between sex within locations (Table 9.1).

9.3 Results of Adult Questionnaire

9.3.1 Characteristics of Sample

Respondent ages ranged from 20 to 70 years, the mean age being 39.5 (median = 39, mode = 40, sd = 12.05). Family sizes ranged from 0 to 12 children, the mean number of children in each household being 3.9 (median = 3.5, mode = 3, sd = 2.31). Significant differences were found in mean ages of respondents divided both by sex and town. Male respondents were significantly older than females ($F_{1,399} = 10.8, p < 0.01$), whilst respondents in Sape were significantly older than those in Labuan Bajo ($F_{1,399} = 38.9, p < 0.0001$). In addition, respondents in Sape had significantly more children than those in Labuan Bajo ($F_{1,388} = 19.8, p < 0.0001$).

The most common occupation of female respondents was housewife (66.5%). Amongst waged employment categories (ignoring categories for housewife and retired⁴) the most common was trader/businessman (41.1%), followed by fisherman (30.8%). Farmers, skilled labourers and professionals each accounted for 8-11% of responses. There were significant differences in the distribution of occupation between the sexes ($\chi^2(4) = 40.0, p < 0.0001$) and between towns ($\chi^2(4) = 38.9, p < 0.0001$). Amongst the sexes, a greater than expected number of males were fishermen, farmers and professionals, whilst a greater than expected number of females were traders. Between the towns, a greater than expected number of Sape residents were farmers, whilst a greater than expected number of Labuan Bajo residents were traders (Table 9.2). Analysis also revealed a significant relationship between occupation and age amongst male respondents ($F_{4,178} = 6.06, p < 0.001$). The mean age of farmers was 50.9, whilst that of other categories ranged from 38.3 to 44.2.

⁴ only seven male respondents were retired.

Table 9.2 Proportion (%) of Respondents in Different Categories of Employment, According to Sex and Town.

Occupation	Total (n=253)	Males (n=184)	Females (n=69)	Sape (n=112)	Labuan Bajo (n=141)
Fishermen	30.8	36.4	15.9	33.9	28.4
Farmers	11.1	15.2	0.0	23.2	1.4
Traders	41.1	29.9	71.0	25.9	53.2
Skilled labourers	8.3	8.2	8.7	8.9	7.8
Professionals	8.7	10.3	4.3	8.0	9.2

The majority (63.3%) were born within the local subdistrict (Sape or Komodo). A further 12.3% were born in the local district (Bima or Manggarai), whilst 9.3% were born in the respective province (East or West Nusa Tenggara). However, 15.0% of respondents were born elsewhere in Indonesia. There were significant differences in the distribution of birthplace between towns ($\chi^2 (3) = 121.2, p < 0.0001$). In Sape, a greater than expected number of respondents were born within the local subdistrict, whilst in Labuan Bajo a greater than expected number were born outside of the local district. This suggests that Labuan Bajo has experienced greater settlement by non-locals than has Sape. There were also significant differences in the distribution of birthplace between categories of employment ($\chi^2 (18) = 37.9, p < 0.01$). A greater than expected number of fishermen and farmers were born within the local subdistrict, whilst a greater than expected number of traders and businessmen were born outside the local subdistrict. In addition a greater than expected number of housewives were born within the local subdistrict. These results suggest that local people are more likely to adhere to traditional gender and employment roles, whilst settlers, both male and female, are more likely to enter the developing commercial sector. No significant differences were found between the sexes, nor in age or number of children, with regard to place of birth.

9.3.2 Interaction with tourists

The families of 30.4% of respondents were dependent upon tourism for part of their income (Table 9.3). Significant differences in degree of dependence were found in all the socio-economic variables except sex. More respondents in Labuan Bajo (52.1%) than in Sape

(10.9%) were dependent upon tourism ($\chi^2 (1) = 75.5, p < 0.0001$). A greater than expected proportion of traders, whilst a smaller than expected proportion of farmers and fishermen, were dependent upon tourism ($\chi^2 (4) = 33.9, p < 0.0001$). In addition, those dependent upon tourism were significantly younger ($F_{1,379} = 25.5, p < 0.0001$), with fewer children ($F_{1,371} = 13.8, p < 0.001$), and more likely to have been born outside the local subdistrict ($\chi^2 (3) = 21.5, p < 0.0001$), than those not dependent upon tourism.

Table 9.3 Interaction of Local Adults With Tourists in Sape and Labuan Bajo

QUESTION	Proportion of Respondents (%)		
	Total	Labuan Bajo	Sape
Is your family dependent upon tourism for income?	30.4	52.1	10.9
What interaction have you had with tourists?			
• Talked with	28.9	34.8	23.0
• Sold goods to	22.1	36.4	8.0
• Acted as a guide for	3.5	6.6	0.5
• Provided another service for	15.1	25.9	4.5

Overall, 28.9% of respondents had spoken to tourists, whilst 22.1% had sold goods to tourists (Table 9.3). Few had provided guide or other services (3.5% and 15.1% respectively). The mean combined score was 0.66 (median/mode = 0, sd = 0.99). There was a significant relationship between score and dependence upon tourism for income ($F_{1,381} = 236.8, p < 0.0001$) and, like the latter variable, significant differences in mean score were found in all the socio-economic variables except sex. Significantly higher scores were associated with Labuan Bajo residents, urban as opposed to rural livelihoods, settlers from outside the province, and younger respondents with fewer children.

9.3.3 Attitudes Towards Tourism

- **Responses to Individual Statements**

The frequencies of response are ranked in descending order of 'agreement with statement' (Table 9.4). Overall, positive statements about individual attitudes occupy higher rankings than negative statements.

Most (90%) respondents agreed that KNP was the reason that tourists visited the area. Similar proportions held a positive attitude towards protection of the park (93.7%), to seeing more tourists (92.7%) and would be happy for their children to work in tourism (88.9%). Two statements suggesting that tourism damages and erodes culture and traditional customs are disagreed with (32.2% and 18.5%), although half of the sample did not like the way that tourists dress (51.8%). In addition the suggestion that only outsiders benefit from tourism is disagreed with (24.1%). However, only half of the sample felt that the whole community benefited from tourism (51.1%), with a similar proportion feeling that only rich people benefited (47.4%). Very few respondents felt that tourism benefited their family or increased their income (27.3% and 23.0% respectively). In addition, over half of respondents felt that tourism had caused prices to rise (49.6%).

Responses ranked separately for each town show some differences (Table 9.4). The range of responses in Sape (13.5% - 99.5%) is greater than in Labuan Bajo (20.5% - 88.0%). This would suggest a greater unity of opinion in Sape than in Labuan Bajo. Of ten statements with significantly different responses by town, respondents in Labuan Bajo exhibited more negative attitudes in seven. The exceptions were that a smaller proportion of Labuan Bajo residents felt that only the rich benefited, whilst a larger proportion felt that their family had benefited from tourism. In addition, and contrary to the results of other impact questions, a smaller proportion of Labuan Bajo residents than Sape residents felt that tourism caused young people to reject traditional culture. In general, respondents in Sape were more positive about tourism. Although they perceived a less equitable benefit distribution, they did not feel that cultural impacts were as prevalent as did respondents in Labuan Bajo.

Table 9.4 Local Adult Attitudes Towards Tourism and Conservation.

Question	+ve or -ve statement	Agreement with Statement (%)			Probability
		Total	Labuan Bajo	Sape	
It is good that Komodo and Rinca are protected by the government	+	93.7	88.0	99.5	0.0001
I would be happy to see more tourists here	+	92.7	94.5	91.0	ns
Tourists come here because of KNP		90.0	82.5	97.5	0.0001
I would be happy for my children to work in the tourism industry	+	88.9	81.4	96.5	0.0001
I do not like the way that tourists dress	-	51.8	65.5	38.0	0.0001
Tourism benefits the whole community	+	51.5	46.0	57.1	0.05
Tourism has caused prices to rise	-	49.6	73.6	27.5	0.0001
Tourism only benefits rich people	-	47.4	35.2	59.5	0.0001
Tourism causes young people to reject traditional customs	-	32.2	26.3	38.2	0.01
Tourism benefits my family	+	27.3	38.0	16.5	0.0001
Only outsiders benefit from tourism here	-	24.1	34.7	13.6	0.0001
My family has more money because of tourism	+	23.0	20.5	25.5	ns
Tourism is damaging our culture	-	18.5	23.5	13.5	0.01

- **Combined Attitude Score**

The mean score on the attitude scale for the 12 attitude questions combined was 7.53 (Median = 8, Mode = 9, sd = 2.2, Fig. 9.1). Scores ranged from 0 to 11, although 74.4% of scores were between 7 and 10. Given that a completely indifferent respondent would have scored 6, this indicates an overall positive attitude towards tourism amongst local people.

As might be expected, those respondents dependent upon tourism for income had a significantly higher mean attitude score than those not dependent upon tourism ($F_{1,369} = 27.1, p < 0.0001$). Significant differences in score were found in all socio-economic variables except number of children. Respondents in Labuan Bajo had a significantly lower mean score than those in Sape (Fig. 9.2), as did female respondents and younger respondents, and those from outside the local district. The relationship between attitude score and job was less clear. The highest mean score was amongst farmers (8.1), followed by traders and professionals (7.9), and fishermen (7.3). The lowest score was amongst skilled labourers (6.3).

Responses were divided into tourism-dependent and tourism-independent sub-classes and mean scores within each were compared between towns. There was no significant difference in the mean scores of those dependent upon tourism for income between Sape and Labuan Bajo. However, of those not dependent upon tourism for income, the mean score in Labuan Bajo was significantly lower than that in Sape (Fig 9.3). Respondents in Labuan Bajo were significantly less positive on nine out of the twelve individual attitude questions, with no significant differences between towns for the other three. These results suggest that, as tourism develops, those who are not benefiting become increasingly disenchanted with it.

The multiple regression model included contact, town, tourism dependence, sex, age and the dummy variable for 'other' as significant variables. The combined R^2 of 0.290 indicates a weak fit of the model to the data, with only a small amount of variance explained by the model. The fit is not increased by using the transformed attitude score variable ($R^2 = 0.297$), although an additional significant variable, the dummy for fishermen, is included in this model (Table 9.5). According to the model, attitude towards tourism becomes more positive with contact, dependence upon tourism and age. Male respondents and those in Sape also have higher scores. However, occupations other than housewife and trader are likely to result in lower scores.

Two discriminant functions were calculated, with strong associations between groups (attitude categories) and predictors (other variables) ($\chi^2 (8) = 98.2, p < 0.0001$). The two functions accounted for 89.9% and 10.1% respectively of the between-group variability, suggesting that the first function is a much more important group discriminator than the second. However, after removal of the first function there was still a significant association between groups and predictors ($\chi^2 (3) = 11.0, p < 0.05$). A plot of group centroids on the two discriminant functions is shown in Fig. 9.4. The first discriminant function best separates the negative attitude group from those with a positive or neutral attitude, whilst the second discriminant function separates the indifferent attitude group from the other two. Four variables contributed significantly to the analysis; town, sex, contact with tourists and dependence upon tourism. These are the same four variables which were entered first into the stepwise multiple regression. 66.0% of cases were correctly classified by this model, compared with 47.1% correct classification by chance alone (Table 9.6).

Table 9.5 Factors Determining Respondent Attitude to Tourism: Results of Multiple Regression

	Untransformed Attitude Score	Transformed Attitude Score
R ² value (p<0.0001)	0.290	0.297
Variable	Coefficient	
• Contact	0.408	-0.086
• Town	-1.779	0.303
• Tourism Dependent	1.582	-0.323
• Sex	-0.888	0.257
• Age	0.030	-0.007
• Dummy Job 'other'	-0.743	0.258
• Dummy Job 'fishermen'	*	0.188
• Constant	7.019	1.478

Table 9.6 Factors Determining Adult Respondent Attitude to Tourism: Results of Discriminant Function Analysis.

Variables	Function 1 (Negative)		Function 2 (Indifferent)	
Contact	-0.35443*		0.26940	
Birthplace	0.32596		0.30090	
Dummy Job 'other'	-0.23377		0.04072	
Tourism Dependent	-0.29404		0.79420*	
Town	0.56233		0.68876*	
Sex	0.35290		-0.35817*	
Dummy Job 'traders'	-0.05817		0.21691	
Age	-0.08490		-0.18198	
Dummy Job 'fishermen'	0.01342		0.14041	
Children	0.01149		-0.13479	
		Predicted Group Membership		
Group	Number of Cases	Indifferent	Negative	Positive
Negative	38	3	18	17
Indifferent	102	4	18	80
Positive	228	1	6	221
* significant variables				

Figure 9.1 Adult Respondent Scores on a Scale of Attitude Towards Tourism.

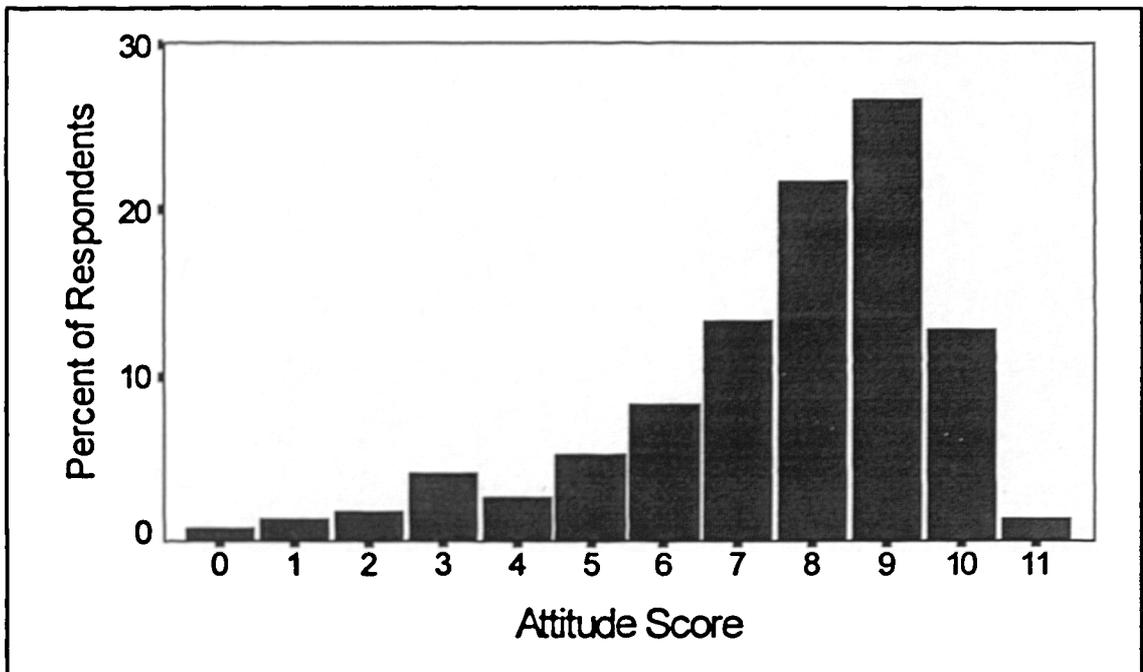


Figure 9.2 Adult Respondent Scores on a Scale of Attitude Towards Tourism, Split by Town.

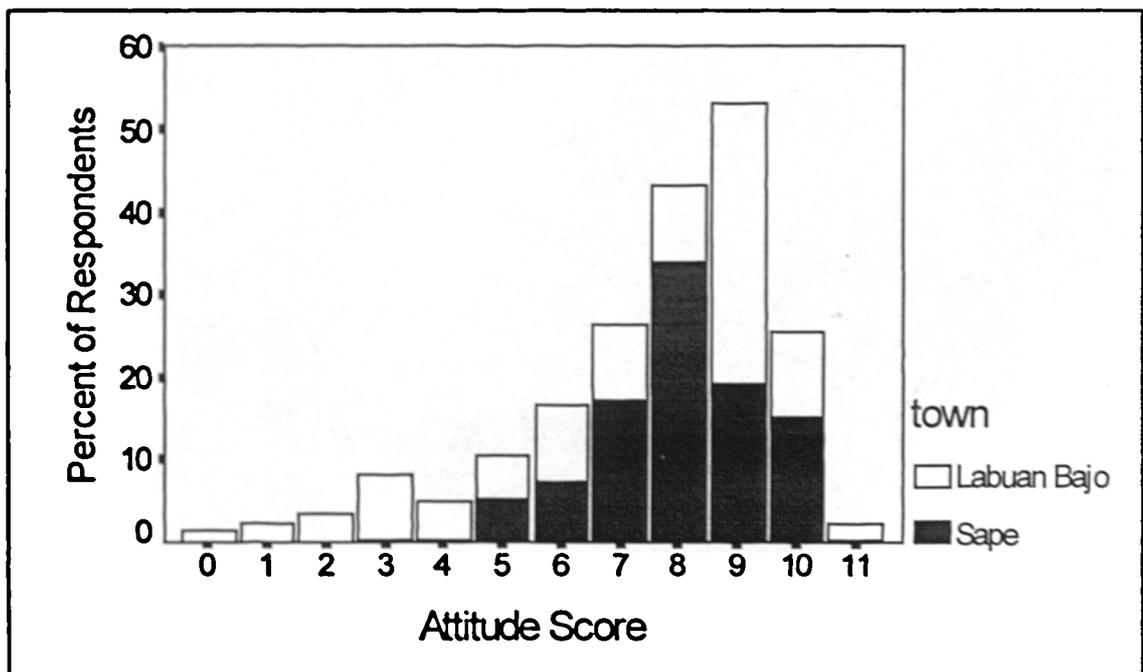


Figure 9.3 Mean Attitude Score of Adult Respondents in Sape and Labuan Bajo, Split by Tourism Dependence.

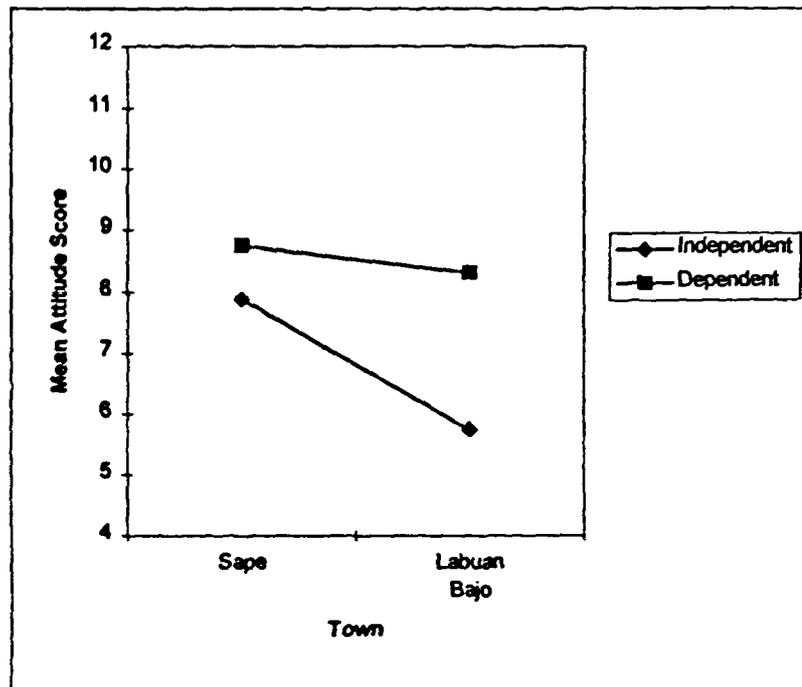
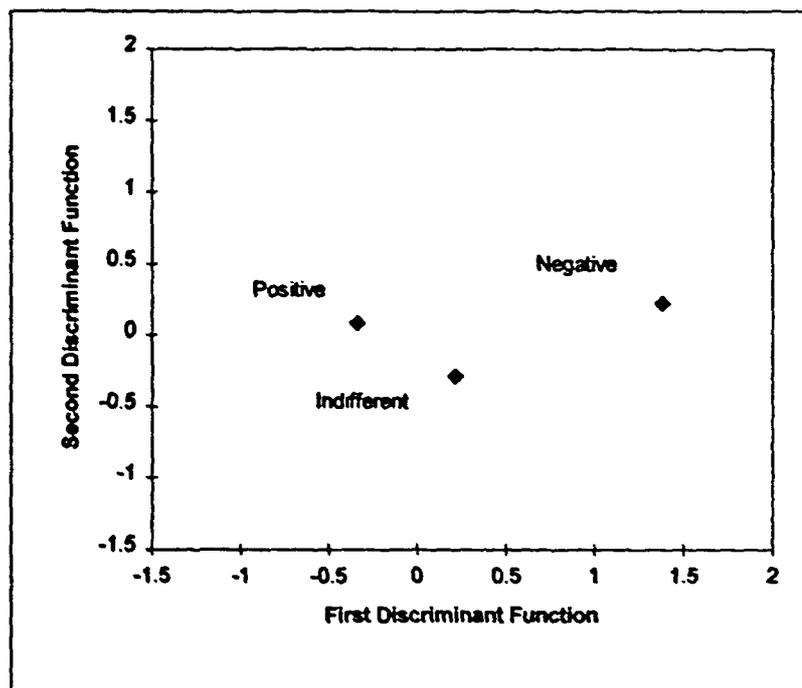


Figure 9.4 Plots of Three Attitude Group Centroids on Two Discriminant Functions Derived from Four Predictor Variables.



9.4 Results of Child Questionnaire

9.4.1 Characteristics of Sample

Respondent ages ranged from 6 to 18 years, the mean age being 12.9 (median = 13, mode = 15, sd = 2.69). There were no significant differences in mean age of respondents divided by sex or town. In total, 75.1% of respondents attended school, although a significantly lower proportion in Labuan Bajo (67.7%) than Sape (82.0%) were still attending school ($\chi^2 (1) = 5.24, p < 0.05$). As might be expected, those attending school were significantly younger than those not attending school ($F_{1,189} = 11.43, p < 0.001$).

The majority of the sample (79.5%) were born within the local subdistrict (Sape or Komodo). A further 14.2% were born in the local district (Bima or Manggarai), whilst 4.7% were born in the respective province (East or West Nusa Tenggara). Only 1.6% of respondents were born elsewhere in Indonesia. There were significant differences in the distribution of birthplace between towns ($\chi^2 (3) = 9.52, p < 0.05$). In Sape, a greater than expected number of respondents were born within the local subdistrict, whilst in Labuan Bajo a greater than expected number were born outside of the local district. These results reflect those of the adult sample although, as might be expected, fewer children than adults were born outside the local subdistrict.

9.4.2 Interaction with tourists

Overall, 29.5% of respondents had spoken to tourists, whilst 11.9% had sold goods to tourists. 14.5% had provided other services, whilst 5.7% had acted as guides for tourists (Table 9.7). The mean combined score was 0.56 (median/mode = 0, sd = 0.87). In addition, 17.6% of respondents had received money from tourists, although the reasons for this were not investigated.

There was a significant relationship between mean contact score and whether or not money had been received from tourists ($F_{1,191} = 115.9, p < 0.0001$). Significant differences in score were found between towns, with Labuan Bajo residents experiencing greater contact ($F_{1,191} = 356.0, p < 0.0001$). A significant positive correlation was also found with age (0.1495, $p < 0.05$). The same pattern of significance was found regarding the receipt of money from tourists. No significant differences were found with either measure of contact in terms of respondent sex, school attendance or place of birth.

Table 9.7 Interaction of Local Children With Tourists in Sape and Labuan Bajo

QUESTION	Proportion of Respondents (%)		
	Total	Labuan Bajo	Sape
What interaction have you had with tourists?			
• Talked with	29.5	43.0	17.0
• Sold goods to	11.9	21.5	3.0
• Acted as a guide for	14.5	26.9	3.0
• Provided another service for	5.7	6.5	5.0

9.4.3 Attitudes Towards Tourism

• Responses to Individual Statements

Results for individual attitude questions are presented in Table 9.8. The frequencies of response are ranked in descending order of 'agreement with statement'. Overall, positive statements occupy higher rankings than negative statements.

The majority of respondents (75.5%) agreed that KNP was the reason that tourists visited the area. Similar proportions held a positive attitude towards protection of the park (88.5%), and towards tourism in general (98.4% would be happy to see more tourists). Statements regarding benefit distribution all received little agreement. Few respondents felt that tourism benefited the community or their family, or felt that their family had more money because of tourism. However, even fewer felt that only the rich or outsiders benefited from tourism. Very few respondents felt that tourism was damaging their culture or causing young people to reject traditional customs. However, a high proportion (73.4%) did not like the way that tourists dress. This suggests a more conservative attitude than might be expected amongst the younger generation.

Table 9.8 Child Attitudes Towards Tourism and Conservation, Split by Town.

Question	+ve or -ve statement	Agreement with Statement (%)			Significance (p<)
		Total	Labuan Bajo	Sape	
I would be happy to see more tourists here	+	98.4	96.8	100.0	ns
It is good that Komodo and Rinca are protected by the government	+	88.5	77.2	99.0	0.0001
Tourists come here because of KNP	+	75.5	48.9	100.0	0.0001
I do not like the way that tourists dress	-	73.4	82.6	65.0	0.05
Tourism benefits the whole community	+	29.5	20.4	38.0	0.01
Tourism benefits my family	+	24.9	39.8	11.0	0.0001
Tourism only benefits rich people	-	18.7	17.2	20.0	ns
Tourism causes young people to reject traditional customs	-	15.6	31.5	1.0	0.0001
Tourism is damaging our culture	-	15.1	30.4	1.0	0.0001
My family has more money because of tourism	+	14.0	18.3	10.0	ns
Only outsiders benefit from tourism here	-	13.0	20.7	6.0	0.05

If responses are ranked separately for each town, some differences between the two appear (Table 9.8). Five of the eleven questions yield 99-100% concurrence amongst Sape residents. As with the adult results, this suggests a greater unity of opinion in Sape than in Labuan Bajo. Of eight questions which yielded significantly different results between towns, seven prompted more positive answers in Sape than in Labuan Bajo. The exception was the

question regarding family benefits from tourism, for which more respondents in Labuan Bajo felt that their families benefited from tourism.

- **Combined Attitude Score**

The mean score on the attitude scale for the 10 attitude questions combined was 6.23 (median, mode = 6, sd = 1.4, Fig.9.5). Scores ranged from 2 to 10, although 80.2% of scores were between 5 and 7. Given that a completely indifferent respondent would have scored 5, this indicates an overall positive attitude towards tourism amongst local children.

Significant differences in score were found between towns, and between respondents who were/were not at school and who had/had not received money from tourists. Respondents in Labuan Bajo had a significantly lower mean score than those in Sape ($F_{1,186} = 21.3$, $p < 0.0001$, Fig.9.6), and school attendees had a significantly higher score than those not at school ($F_{1,185} = 14.8$, $p < 0.001$). As might be expected, those who had received money from tourists had a significantly higher mean score than those who had not ($F_{1,186} = 5.43$, $p < 0.05$). No significant differences were found in terms of sex, age or place of birth of respondents.

The multiple regression model included contact, town, and 'at school' as significant variables. The combined R^2 of 0.228 indicates a weak fit to the data, with only a small amount of variance explained by the model. According to the model, attitude towards tourism becomes more positive with contact. Schoolchildren, and residents of Sape, have higher scores than those not attending school and residents of Labuan Bajo respectively (Table 9.9).

Figure 9.5 Child Respondent Scores on a Scale of Attitude Towards Tourism.

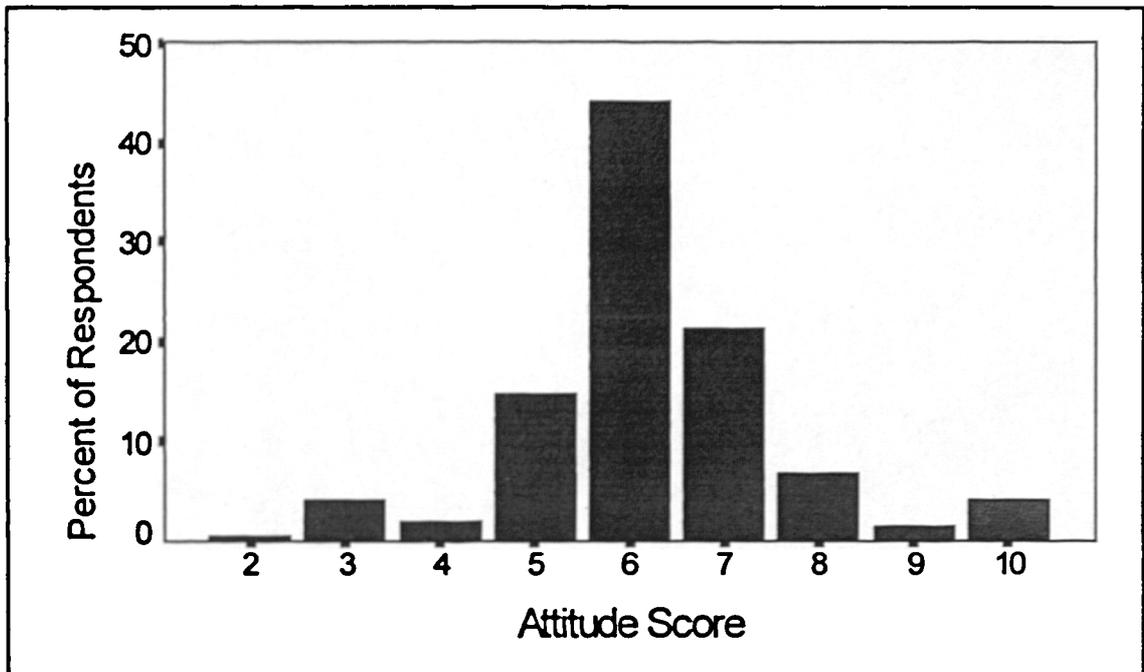


Figure 9.6 Child Respondent Scores on a Scale of Attitude Towards Tourism, Split by Town.

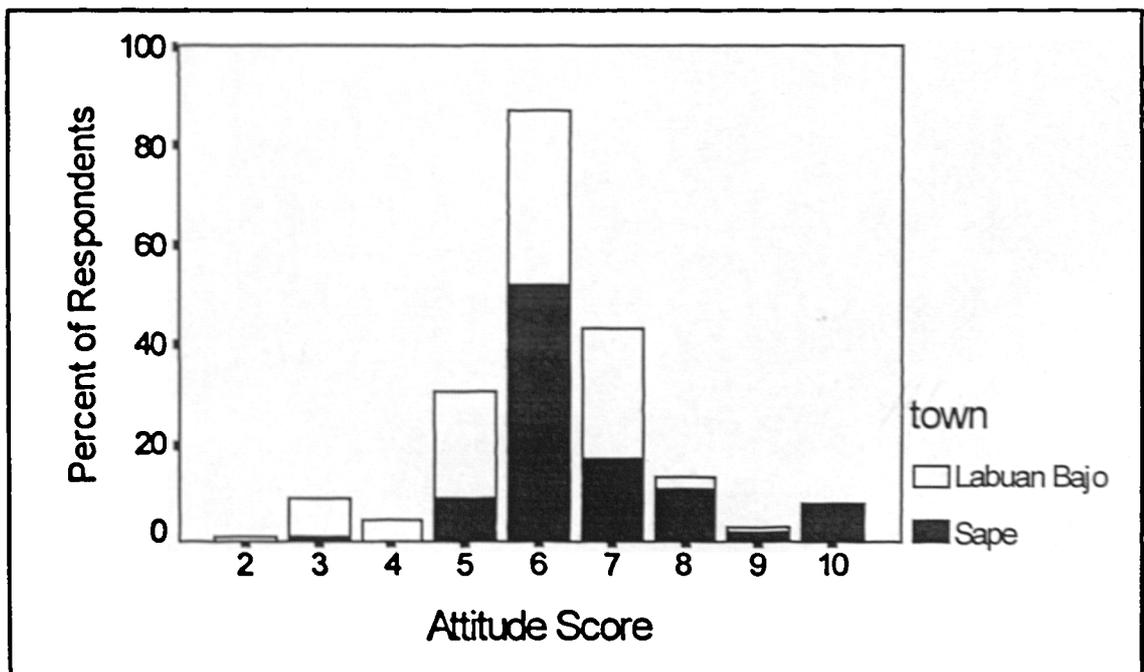


Table 9.9 Factors Determining Child Respondent Attitude to Tourism: Results of Multiple Regression

	Untransformed Attitude Score
R ² value (p<0.0001)	0.228
Variable	Coefficient
• Contact	0.424
• Town	-1.143
• At School	0.730
• Constant	5.927

9.5 Comparison of Adult and Child Results

9.5.1 Interaction with Tourists

No significant difference was found between mean contact score of adults and children. As might be expected, among separate categories of contact, a greater proportion of adults than children had sold goods to tourists ($\chi^2(1) = 8.85, p < 0.01$, Table 9.10).

Table 9.10 Comparison of the Interaction of Local Adults and Children With Tourists

QUESTION	Adults (%)	Children (%)	Significance
What interaction have you had with tourists?			
• Talked with	28.9	29.5	ns
• Sold goods to	22.1	11.9	0.01
• Acted as a guide for	3.5	5.7	ns
• Provided another service for	15.1	14.5	ns

9.5.2 Attitudes Towards Tourism

• Responses to Individual Statements

There are significant differences between adult and child responses in nine out of eleven statements included on both questionnaires (Table 9.11). In seven of these children exhibit less agreement, but there is no clear pattern between positive and negative statements.

A greater proportion of children would be happy to see more tourists, but fewer favoured KNP protection or linked tourism with KNP. Fewer children than adults felt that tourism benefited the whole community or resulted in more money for their family, but fewer also felt that only the rich or outsiders benefited from tourism. Fewer children than adults felt that tourism caused young people to reject traditional customs, whilst, surprisingly, a greater proportion did not like the way that tourists dress.

- **Combined Attitude Score**

The mean score on the attitude scale for the 10 attitude questions combined was 6.14 for adults and 6.23 for children. There was no significant difference between these results.

Table 9.11 Comparison of Attitudes Towards Tourism and Conservation Between Adults and Children, Split by Town.

Question	Adults	Children	Significance (p<)
I would be happy to see more tourists here	92.7	98.4	0.01
It is good that Komodo and Rinca are protected by the government	93.7	88.5	0.05
Tourists come here because of KNP	90.0	75.5	0.0001
I do not like the way that tourists dress	51.8	73.4	0.0001
Tourism benefits the whole community	51.5	29.5	0.0001
Tourism benefits my family	21.3	24.9	ns
Tourism only benefits rich people	47.4	18.7	0.0001
Tourism causes young people to reject traditional customs	32.2	15.6	0.0001
Tourism is damaging our culture	18.5	15.1	ns
My family has more money because of tourism	23.0	14.0	0.05
Only outsiders benefit from tourism here	24.1	13.0	0.01

9.6 Discussion

The survey described in this chapter had intended to examine the attitudes of representatives of communities both within and bordering KNP. Survey data limitations were such that the most important comparison, between KNP residents who bear the greatest opportunity costs of KNP and those bordering the park who gain the most benefits from tourism, could not be made. Although the response of Kampung Komodo residents suggested an outwardly positive attitude towards tourism, there are clearly conflicts between the village and the park, notably over the water supply which serves the visitor camp and the village (Chapter 6). There have also been conflicts between tourists and villagers regarding the shuttle boat from the ferry to Komodo Island (Chapter 7).

The homogeneity of response amongst Kampung Komodo residents may be taken to suggest that, for whatever reason, the villagers are unwilling to share their opinions with external researchers or those associated with local authorities. In a situation where conflict exists, rapid attitude surveys of this nature may be inappropriate, and inferences must be made from other indirect evidence. As a result, this chapter has focused instead on the differences in local contact with tourists, and attitudes towards tourism, of residents in Sape and Labuan Bajo.

There are clear demographic and socio-economic differences between Sape and Labuan Bajo. Sape retains an older, more rural population, with less immigration and less urban opportunities. It is also clear that the local residents participate less in developing urban sectors than settlers do. Labuan Bajo has reached a further stage of economic development than Sape, due perhaps to government investment in transport infrastructure comparable to that of Bima. Both a deep water harbour and an airstrip have been recently constructed in Labuan Bajo. In addition, the focus on the town as the principal gateway to KNP may have accelerated urban growth and development.

Residents of Labuan Bajo have a greater level of contact with tourists than those in Sape, across all categories presented to them in the survey. This is to be expected given the greater volume of visitors to Labuan Bajo. In addition, a greater proportion of families in Labuan Bajo received some income from tourism than those in Sape. This also is to be expected given the increased revenue and number of jobs supported by tourism in Labuan Bajo (see Chapter 8). These results support the assumption that residents of Labuan Bajo have a greater

exposure to and experience of tourism than those in Sape. Labuan Bajo equates to a later stage in the evolution of tourism development than Sape. However, it should be noted that in both towns the minority of respondents had experienced contact or financial benefit from tourism. Both towns remain in the earlier stages of tourism development.

The overall attitude of local people towards tourism was positive. Most respondents would be happy to see more tourists, and for their children to work in the tourism industry. In addition, most respondents approved of the protection of KNP, perhaps because of the link they perceived between KNP and tourism. Few respondents perceived any cultural damage from tourism, although half were concerned about tourist dress code. However, there was a mixed response regarding the distribution of benefits from tourism. It is clear from the survey and the results in Chapter 8 that the distribution of benefits is uneven both within and between local communities, and this is reflected in respondent perceptions. Respondents were also of divided opinion regarding local tourism-linked inflation.

As might be expected, the overall attitude of those who had benefited from tourism was higher than those who had not. This conforms with the results of a study of attitudes amongst employees in tourism and non-tourism-related enterprises in Cape Cod (Pizam and Pokela, 1978). In addition, the overall attitude towards tourism in Labuan Bajo was less positive than in Sape. If Sape and Labuan Bajo are assumed to represent earlier and later stages in the touristic development of a destination, then this result conforms to Doxey's proposed attitude spectrum, with increased development associated with increasing ambivalence towards tourism (Doxey, 1975). A similar pattern was found in a survey of Balinese villages with varying distance from tourism centres on the island (Wall, 1996). However, the interrelationship between location and receipt of benefits from tourism in determining individual attitude around KNP suggests that there is not a unidirectional decline in enthusiasm with development, but rather an increasing heterogeneity of attitude within a community. Those who benefited from tourism had an equally positive attitude between towns, whilst of those who did not benefit there was a less positive attitude amongst Labuan Bajo residents than Sape residents. Perhaps it is no surprise that, as more benefits are bestowed, those who do not participate become more antagonised, since they are more likely to perceive their relative disadvantage. This observation equates more closely to the theory proposed by Dogan (1989) than that of Doxey (1975).

The patterns of responses amongst the sample of child respondents mirrored those of adult respondents. No significant differences were found between levels of contact with, or overall attitudes towards, tourism between adult and child respondents. This suggests that, contrary to the results of other studies (Andronicou, 1979) youth does not appear to breed a more positive attitude towards tourism. This may be a result of children adopting the attitudes of their parents, particularly in a society which has only relatively recently been exposed to change. With regard to individual attitude statements, children expressed less agreement than adults, regardless of whether statements were positive or negative. One possible explanation for this pattern is that children have answered in the negative where they are unsure of their opinion. It is likely that fewer children than adults have a well-informed or well-developed perception of tourism, and some of the questions may have been beyond the capacity of children to answer. In these circumstances one might expect children to give a negative response when they feel that they don't know.

Overall attitudes in both Sape and Labuan Bajo suggest that tourism has not reached a stage whereby local people have become antagonised by it. However, the results of the survey do suggest that the development of tourism is perceived by local people as having economic, social and cultural side-effects. In addition, distributional inequalities may adversely affect the attitude of local people towards tourism and, by association, KNP. The assumption that tourism provides benefits that result in *local* people valuing KNP more highly (Goodwin, 1996) is not supported.

10. Discussion - Tourism, Conservation & Local Development

10.1 Introduction

This chapter presents an integrated discussion of the findings of the study. It returns to the original aims, which were to assess whether tourism to KNP achieved the three principal objectives of ecotourism and to examine the impacts of different types of tourist (Chapter 1). In attempting to achieve these aims, the study has examined the scale and type of tourism to KNP (Chapter 5), and both the ecological and economic impacts of tourism on the park (Chapters 6 and 7). It has also examined the local economic impact for local communities within and adjacent to the park (Chapter 8), and the attitudes of local people towards tourism (Chapter 9). By examining tourism across a series of issues, a number of complementary performance indicators can be measured simultaneously.

This concluding chapter brings together the results of each of the preceding five chapters in an overall assessment of tourism, culminating in a series of recommendations for the future development of tourism in and around KNP. After a brief review of the concept of ecotourism, Section 10.2 considers whether tourism to KNP currently meets the assumptions of ecotourism, whilst Section 10.3 examines the overall impact of different types of visitors to KNP on conservation and local development. In Section 10.4, the direction of tourism development in and around KNP is considered, in order to determine whether or not tourism is developing towards or away from ecotourism. Suggestions are then given for possible changes which could be made to improve the sustainability of KNP tourism (Section 10.5). This is based on personal conclusions and the results of a local workshop on sustainable tourism at which the preliminary results of the study were presented and discussed. The chapter ends with a concluding summary which considers the wider implications of the study for future ecotourism research (Section 10.6).

10.2 Is KNP Tourism Ecotourism?

10.2.1 A Brief Review of Ecotourism

Ecotourism means different things to different people. However, in the conservation literature it clearly equates to sustainable, nature-based tourism (Boo, 1992; Goodwin, 1996).

Ecotourism as an *ideological concept* stems from the development of new philosophies in conservation and tourism, principally the embracement of local community development within the aims of protected area conservation, and the rejection of 'mass' tourism as inherently unsustainable.

Tourism has been associated with national parks since their inception, as Chapter 1 illustrates. It remains one of the only legitimate uses of national parks worldwide. Promoters of national park tourism have cited its environmentally benign nature and its potential as a revenue earner for conservation. With the emergence of integrated conservation and development theories in the 1980s, the need to find means of providing local community benefits from parks yielded a third argument in favour of tourism; as a non-extractive export industry it promised benefits both for parks *and* people, and could be used to mitigate conflict between the two.

The crystallisation of ideas regarding tourism and conservation into the concept of ecotourism coincided with the emergence of another major catchphrase, 'sustainable development'. Ecotourism is a prime candidate for actualising the concept of sustainable development. It has also been used by some parts of the tourism industry as nothing more than a marketing tool for any form of unreconstructed nature-based tourism.

The concept of ecotourism, fusing biocentric and egalitarian ideals, emerged in the late 1980s, and the early and mid 1990s have witnessed a proliferation of literature defining, redefining, criticising and defending it. Countless series of guidelines have been developed outlining best practice. Certain destinations have been heralded as showcases of ecotourism (the publicity for which may have ultimately resulted in their decline). However, very little research has been conducted which tests any of the three major cornerstones of ecotourism. Very little is known about whether protected area tourism, or other forms of nature-based tourism labelled ecotourism, actually conform to the ideological definition of the term. This study is one of a series of three which has attempted to do so (see also Goodwin *et al.*, 1997a,b,d). Tourism to KNP has been examined with regard to the three principal assumptions of ecotourism. The following sections consider whether each of these assumptions is fulfilled.

10.2.2 Assumption 1: Tourism Does Not Conflict with Protected Area Conservation

The principal conservation objective of KNP is the preservation of the Komodo dragon populations within the park. Additional aims include the preservation of biodiversity, including the rich marine environment, endemic flora and fauna and the unusual assemblage of Wallacean transitional biodiversity.

On the surface there appears to be little conflict between tourism and conservation in KNP (Chapter 6). Tourism is confined geographically by a number of management control measures. In addition, activities perceived as being particularly damaging have been curbed. Particular reference is made to the cessation of dragon feeding and the construction of permanent mooring buoys to limit anchor damage to coral. The principal impacts of tourism are pollution and trampling (trails and coral). In this respect tourism to KNP lies at the 'mild' end of the impact spectrum developed by Speight (1973). Impacts should be reversible over the short term with appropriate management intervention, as has already been witnessed with the cessation of provisioning at Banu Nggulung.

However, these conclusions are made with a paucity of data. KNP lacks an integrated monitoring and management system. A tourism strategy was established by the original management plan for the park written twenty years ago. Little has been updated despite the fact that tourism has long since exceeded the capacity anticipated by that plan. Furthermore, neither baseline ecological knowledge nor knowledge of tourism impacts in the park have been substantially improved since that plan was written. Indeed, there is a complete lack of regular and comprehensive ecological monitoring.

10.2.3 Assumption 2: Tourism Contributes (Financially) to Protected Area Conservation

The revenue from visitor entrance fees may barely offset the direct, identifiable park costs associated with tourism in KNP (Chapter 7). However, it does not contribute to the wider running costs of the park. The pricing policy for national parks in Indonesia, as in many developing countries, assumes that parks are merit goods which should be (almost) freely available to society as a whole. However, for whatever reason (cultural differences, cost of transport) KNP is currently visited almost exclusively by foreign tourists from developed nations. Moreover, operators and organisations which benefit substantially from KNP (cruise

ship and package tour operators, and the Koperasi) do not pay any form of concession or license fee for access to KNP. On both accounts the current pricing policy may be inappropriate.

It may be argued that even small revenues from tourism engender political support and goodwill for parks despite the lack of a clear 'profit'. In addition, the foreign exchange import potential of parks may be recognised as a significant value against which to offset costs. However, regardless of either argument, there is no direct contribution to conservation in KNP.

The assumption of ecotourism is that it benefits conservation, that it puts something back into the resource on which it depends. If it simply offsets its costs then it is not achieving this aim. However, even if the benefits of tourism were to outweigh the costs, there would still be no direct benefit to the park. This is due to the lack of linkage between benefits and costs; costs are borne by central government, whilst benefits are distributed between local, provincial and national levels of government. There is currently no incentive at managerial level to increase the benefits from tourism for the benefit of conservation.

10.2.4 Assumption 3: Tourism Benefits Local Communities

A large amount of expenditure by foreign visitors is associated with tourism to KNP. However, of this an estimated 85% bypasses the local economy. Of that which is spent locally, at least 50% is lost in leakage through the import of goods and labour. Of the estimated US\$1 million which is spent locally, only 1% accrues to local people living within the park itself (see Chapter 8). In the adjacent town communities, more benefits are witnessed by younger, more recent settlers with urban professions than by the more traditional residents (Chapter 9).

The concept of integrated conservation and development recognises that certain groups of local people are disadvantaged by protected areas and therefore deserve to benefit from any use made of them. In the case of KNP, the island villagers have forfeited the most, and have had to restrict their development and lifestyle within the boundaries of protected area legislation. These are, arguably, the local people to which the ideologies of ecotourism and integrated conservation and development refer. Whilst the fact that tourism has stimulated the

local economy surrounding the park is of positive note, the fact that the island villagers are almost totally excluded from this benefit is clearly not.

A small number of local people in Kampung Komodo benefit by carving wooden dragons for the tourist market. However, their access to visitors is limited by park restrictions on the sale of goods. They may only sell through the Koperasi outlet on Komodo, which clearly limits both their marketing and profitability. Two boats service the ferry passengers disembarking at Komodo island, and these generate a similar amount of revenue as the woodcarvers. In addition a small amount of tourism-associated work is available in the park at peak times, although this amounts to very little. This is the sum total of the benefits which local villagers receive from tourism to the park.

Whilst the attitudes of local people in Sape and Labuan Bajo towards tourism, and by association towards the park, remains positive, that of the villagers within the park is unclear (Chapter 9). Conflict exists between the village and the visitor camp over water resources (Chapter 6). Park restrictions over terrestrial access and utilisation are also met with some opposition (Sudibyo, 1995a). Currently it would appear that the assumption that tourism benefits *local* people, such that their perception of KNP is positively altered (Goodwin, 1996), is not being met.

10.3 Are KNP Tourists Ecotourists?

Chapter 5 identified two overlapping typologies of tourists. The first, based upon mode of transport, distinguishes ferry passengers, charter boat passengers, and cruise ship passengers. The second, based upon type of tour, distinguishes independent travel, package tour and cruise. Cruise ship passengers are identifiably separate from other groups. Package tourists are also charter passengers (from Sape), whilst independent tourists are both ferry passengers and charter passengers (From Labuan Bajo and Lombok). In addition to these two typologies, Chapter 6 differentiates overnight visitors to KNP (principally ferry passengers) from day trippers (most charter passengers and all cruise ship passengers). Different types of tourist have been shown to have different ecological and economic impacts on KNP and local communities (Chapters 6, 7 & 8). These are summarised in Table 10.1, which is an amalgamation of Tables 5.10, 6.1, 7.5 and 8.8.

Table 10.1 Summary of the Ecological and Economic Impacts of Different Types of Visitor to KNP, 1995/96.

TYPOLOGIES			IMPACTS			
Type of Tour	Transport	Overnight in KNP?	Principal Ecological Impacts in KNP	Revenue to KNP (US\$)	Total Expenditure in KNP (US\$)	Expenditure in Local Communities (US\$)
Cruise	Cruise ship	No	Overcrowding and disturbance on trails, coral damage	0.87	1.34	0.03
Package	Charter Sape	Yes, Some	Coral damage, marine pollution	0.87	2.11	52.46
Independent	Charter Lombok	No	Coral damage, marine pollution	0.87	1.36	97.43
	Charter Labuan Bajo	No	Coral damage, marine pollution	0.87	1.72	
	Ferry	Yes, All	Litter and water consumption, wider distribution of trail pressure	0.87	6.00	

The major distinction in terms of visitors to KNP is between overnight visitors (90% ferry passengers, 10% charter passengers) and day visitors (most charter passengers and all cruise passengers). However, it should be noted that both ecological and economic impacts upon KNP are small for all types of tourist. Terrestrial ecological impacts are in different ways related to both intensity of activity and length of stay, such that overnight visitors and large cruise ship groups have greater impacts than smaller groups of day-trippers (charter tours). Conversely, marine pollution per visitor is likely to be greater for those arriving in small groups in small charter boats. Coral damage is determined by access to Red Beach, such that charter and cruise passengers are more culpable than ferry passengers who rarely gain access to the site. Again, the larger cruise ship groups are likely to create more impacts. In fairness to large cruise ship groups, their major impact on the Banu Nggulung trail is social, due to overcrowding. Social and aesthetic impacts on visitors was not a focus of this study, although evidence suggests that some visitors are perceiving the trail and viewing site to be overcrowded (Chapter 7).

All visitors contribute the same per person entrance fee (Table 10.1). As such their contribution to conservation, in terms of financial returns to the government which funds KNP, is equal. The greatest difference between visitor types within the park is their overall expenditure above and beyond the entrance fee. Again, length of stay in KNP is the determining factor, with overnight visitors spending considerably more per person than day-trippers. However, none of this extra revenue accrues directly to KNP. Moreover, the additional workload which overnight visitors entail for KNP staff may prevent them from performing more valuable conservation-related tasks such as patrolling. However, it has also been argued that this additional revenue can still be considered a contribution to conservation since a proportion of it accrues to KNP staff as additional income, which may improve staff morale and motivation.

The differences between visitor types in terms of their contribution to local communities is clearer. Independent travellers spend more per person, and more of their overall expenditure on a visit to KNP, in the local communities within and around KNP (Tables 8.8 & 10.1). Most importantly, they contribute a significant proportion of the total revenue, via the shuttle from the ferry to the island, which accrues to the village of Kampung Komodo within KNP. Package tourists on an organised charter tour principally contribute revenue to the charter boat section of the economy in Sape. However, the sum indicated in Table 10.1 masks considerable leakage as a result of non-local ownership of the boats involved. Leakage will

be greater for this type of tour because the boats tend to be larger and more well-equipped than those used by independent charter tourists from Labuan Bajo. Cruise ship passengers contribute virtually nothing to the local economy (Table 10.1).

This study has clearly identified transport type as a determinant of the impacts which different visitors to KNP have. An equivalent study in India identified accommodation as the most useful indicator with regard to tourism impacts (Goodwin *et al.*, 1997b). There is a spectrum amongst visitors, with different types and levels of both positive and negative impact on KNP and local communities. At one extreme are the fully independent travellers, who become fully immersed in KNP and its surroundings, who contribute the most economic benefits but who, by nature of their increased levels of contact (both ecological and social), may cause the most change. At the other extreme are the cruise ship passengers, who experience the minimum level of contact with both KNP and the local community, and who contribute the minimum economic benefit. These conform to Krippendorf's 'alternative tourism' vs. 'ghetto tourism' extremes (Krippendorf, 1987).

Cruise ships are essentially a form of enclave development, in which the visitor experience is self-contained and virtually isolated from the surrounding environment. In common with enclave resort developments, leakages and bypasses are high and benefit flows small (Freitag, 1994). Whilst enclave developments have been welcomed as a more 'honest' and less damaging form of tourism (Krippendorf, 1987), this type of development cannot be recommended in its current form for KNP. It is characterised by the minimal of local linkages, and neither KNP nor local communities exert any control over it.

10.4 Is KNP Tourism Developing Towards or Away From the Concept of Ecotourism?

10.4.1 Tourism and Conservation

Two forms of change are occurring in tourism to KNP; changes in visitation and changes in management. KNP management is attempting to make tourism more sustainable in the park, in two ways. Firstly by altering the visitor experience towards a more ecologically sustainable product, and secondly by altering the entrance fee to raise the financial benefits of tourism.

KNP management has moved the focus of tourism from the artificial spectacle of provisioning towards a more natural experience. The previous director had hoped to promote a longer length of stay with more widespread excursions into the interior of the islands (Subijanto, *pers.comm.*). This is impractical for most visitors, and currently there are attempts to attract more dragons to Banu Nggulung by piping water into the dry riverbed at the site. It is too early to judge the efficacy of this activity at present. Whilst the ecological benefits of management intervention are clear, there is an associated community cost to the cessation of provisioning. A valuable source of revenue for Kampung Komodo, the sale of goats used for provisioning, has been removed.

KNP management has applied to PHPA for permission to raise entrance fees, which has allegedly been approved (Tatang, *pers.comm.*). An application has also been made for KNP to become a fund-holding body, with the effect that revenues from tourism would be retained by KNP and used to fund management and protection (Subijanto, *pers.comm.*). A rise in entrance fee would increase the benefits of tourism. However, a single indiscriminate rise may effect the type of visitors to KNP, and hence decrease the benefits which the local economy would accrue from tourism (Chapters 7 & 8). If KNP were to become self-funding, tourism revenues would flow directly to conservation. However, if this policy were to be combined with a decrease or cessation of core government funding (as has happened in Zimbabwe: Potts *et al.*, 1996; Goodwin *et al.*, 1997d), then KNP would become fully dependent upon tourism and hence vulnerable to changes and fluctuations in the market. In addition, for KNP to become completely self-funded would demand a large rise in entrance fee or the development of other revenue generating activities. Focusing management on revenue generation may jeopardise the conservation priorities of KNP.

Changes in visitation are occurring outside of management control. KNP is experiencing rapid, uncontrolled growth in visitor numbers, and the arrival of larger groups of visitors with shorter lengths of stay. This aspect of tourism is inherently unsustainable without strict management intervention. A concurrent trend is the increasing popularity of Rinca Island as a more natural and uncrowded destination. This may be of benefit for KNP. Firstly, it diversifies the product which KNP offers, and maintains the attraction of KNP for those visitors who prefer a more natural experience. Secondly, it eases the pressure on the already overcrowded visitor developments on Komodo Island. And thirdly, it provides a significant flow of revenue to the local economy via local charter boats, currently the only means of transport to Rinca. However, the *ad hoc* nature of the development of transport to Rinca

renders it vulnerable to the same patterns of external domination and uncontrolled growth which has occurred for visits to Komodo Island.

10.4.2 Tourism and Local Community Development

As has been noted above, cessation of provisioning has reduced the benefits of tourism for Kampung Komodo. The possible cessation or limitation of scheduled ferry stops at Komodo Island (Table 10.2) would further reduce local benefits. However, were overnight accommodation on the islands to be limited, the conflict over the freshwater supply would be reduced.

The emergence and growth of externally controlled tours to KNP (cruise ships, package tours) is limiting local involvement and benefits from tourism to KNP. In addition, the developments within local gateways to KNP is following a pattern of increased non-local ownership, increasingly foreign types of development (cuisine, retail products), and increased leakages. Local attitudes towards tourism are becoming increasingly ambivalent with increasing development. These patterns all suggest a continued move away from the concept of ecotourism.

10.4.3 Application of the Tourist Destination Lifecycle

A number of related models for the evolution of tourism were considered in Chapter 2. It is useful here to compare KNP tourism with these theoretical models.

- **Tourism Growth Curve (Butler, 1980)**

The pattern of KNP arrivals (Fig.5.1) mirrors the first half of the sigmoid growth curve promoted by Butler (1980). KNP tourism has entered the rapid growth phase following the initial discovery of the destination.

- **Tourism Typologies (Cohen, 1972; Plog, 1973; Cochrane, 1993a)**

Whilst independent travellers continue to frequent KNP, and will continue to do so as public transport improves, recent years have also witnessed a proliferation of package tours and mass cruise transport. KNP by the nature of its attraction is unlikely to become simply an organised mass tourist destination, but it is assuming more of the identity of mass tourism as it develops.

- **Tourism Development (Keller, 1987)**

KNP tourism still exhibits some local control, resulting in a number of benefits flowing to the local economy. However, the situation is evolving towards Keller's *institutionalism* stage, whereby control becomes dominated by external forces. At this stage leakages increase, and local benefits decrease. Currently, the majority of benefits do not accrue to local communities.

- **Local Attitudes (Doxey, 1975; Dogan, 1989)**

Doxey has suggested that, as tourism development increases, locals become increasingly ambivalent and antagonistic towards it. Dogan's more sophisticated model suggests instead that attitudes become more heterogeneous as a result of unequal distribution of benefits within a community. The latter appears to be observed if one compares attitudes in Sape with those in Labuan Bajo.

10.5 Recommendations for the Development of Tourism to KNP

KNP tourism is not ecotourism, it more closely equates to mass nature-tourism. The growth of tourism to the park and the development of the tourist industry surrounding the park is unregulated, and vulnerable to external forces.

It is clear that KNP tourism has reached a midway point on most of the theoretical spectrums proposed in the literature. It has progressed beyond the initial discovery period and entered a period of growth and development which has attracted external interest and reduced local control (by KNP and local communities). In this respect it conforms to the traditional political economic view of tourism as perpetuating existing inequalities between the under-developed periphery and the metropolitan core (Keller, 1987; Lea, 1988).

However, the direction of the evolution of tourism development is not irreversible. Theoretical models and practical examples suggest that the approach of a crisis stage in development can lead to either rejuvenation or decline. KNP tourism has not yet reached the crisis stage, but may be approaching it.

The concept of sustainability demands something other than a *laissez-faire* approach to development. To achieve sustainable tourism requires one of two strategies (Keller, 1987):

Maintain local control over decision-making - This assumes that local communities can resist pressure from external investors to obtain a controlling majority in development programmes, and that KNP management can exert influence upon external operators with respect to the control and regulation of arrivals to the park.

Limit the extent of development - Limit growth at a scale which can be achieved using local resources under local control. This may not generate the same amount of visitors and revenue, but is likely to reduce imports and leakages, and will also reduce ecological and conservation pressures within KNP.

The issues surrounding tourism to KNP were discussed at a three-day workshop on sustainable tourism held in Labuan Bajo in April 1996 as part of the DICE/ODA project (Chapter 4). Representatives of KNP, local communities, local tourism businesses, external tour operators and NGOs all contributed to the presentations and discussions. A series of recommendations were developed with respect to tourism development, management, and local involvement.

10.5.1 Tourism Management in KNP

It is recognised by KNP managers that there are limitations to the current efficacy of management. Particular problems stem from a lack of information and understanding about park ecology and tourism, deficiencies in regulation and control mechanisms, professionalism of management and access to resources, particularly financial (Subijanto, 1996). These are all areas where improvements can be made. Reference to the major problems encountered by the park, and suggested remedial actions, are presented in Table 10.2.

In determining the performance of tourism with respect to conservation, there is a need to *define* what constitutes conflict and then to *monitor* the changes which tourism incurs, i.e.,

**Table 10.2 Recommendations Regarding the Management of Tourism in KNP
(Arising from the DICE/ODA Workshop on Sustainable Tourism, April 1996).**

Problem	Recommendation
<ul style="list-style-type: none"> • Visitor overcrowding • Unscheduled boat arrivals • Fresh water supply • Litter/waste • Misunderstanding/lack of awareness amongst visitors over pricing/activities • Visitor complaints about quality of service 	<p>Establish controls to regulate the flow of visitors, including a prior booking facility</p> <p>Regulate boat access to KNP, possibly via the harbour master</p> <p>(1) bury the water pipe below the surface, or (2) find an alternative freshwater source, or (3) build a desalination plant, or (4) limit or prohibit overnight accommodation on Komodo Island, possibly by limitation of ferry stops at the island.</p> <p>Remove bins and encourage visitors to take their litter away. Improve waste management and disposal.</p> <p>Wide distribution of accurate and up-to-date information, via tour operators and the local/regional transport and accommodation infrastructure, regarding the visitor experience at KNP, activities and services provided and fee structures.</p> <p>Improvements should be made to the quality of guiding, through training in (1) foreign language skills, (2) natural history and interpretative skills, (3) public relations skills.</p> <p>Accommodation services should be basic and sanitary, but NOT substantially improved if KNP wishes to limit, rather than encourage, overnight stay in the park.</p>

limits of acceptable change must be set and management designed to confine the impacts of tourism within these limits. In the absence of clearly defined objectives and coherent monitoring of performance indicators, it is difficult to ensure sustainable tourism. One of the

discussion sessions at the workshop considered the priorities and responsibilities for ecological monitoring of tourism in KNP (Table 10.3). The major recommendation was the importance of continuity in a monitoring programme, to provide consistent data over the long term.

Table 10.3 Recommendations for monitoring the Impacts of Tourism in KNP (Arising from the DICE/ODA Workshop on Sustainable Tourism, April 1996).

Priorities for Impact Monitoring
<ul style="list-style-type: none"> • Marine Environment • Fresh Water Carrying Capacity • Trail Condition • Litter and Waste • Noise Pollution • Wildlife Habituation
Responsibilities for Monitoring
<ul style="list-style-type: none"> • Prime responsibility for monitoring lies with KNP. • However, other stakeholders should be involved. There should be cooperation between KNP, local government, NGOs, tour operators and the local community. • KNP should develop appropriate partners for each area of monitoring • The importance of long-term continuity of monitoring and management is stressed.

10.5.2 An Appropriate Pricing Policy for KNP

It is recognised that the current pricing policy is inappropriate for KNP, and applications have been made to alter the policy to provide greater revenue and the possible retention of revenue by KNP for management purposes. The results of this study (Chapter 7) have explored a number of issues surrounding pricing policy, and a number of recommendations are made (Table 10.4).

Table 10.4 Recommendations Regarding the Pricing Policy for Tourism in KNP.

- The current fee is too low for foreign tourists and should be raised, although caution should be applied over raising the price too high.
- A policy based on 'fair fees' which reflect both (1) ability to pay and (2) payment in proportion to benefits received may be more equitable than a system based upon 'efficient fees' which reflect payment in proportion to the costs of management (Laarman & Gregerson, 1996). With this in mind;
 - Consider a dual pricing system where local domestic tourists (who have a lower income and who already subsidise parks through domestic taxes), pay less than foreign tourists.
 - Consider a tiered pricing system for foreign visitors, whereby package tourists pay proportionally more than independent tourists, reflecting their lesser contribution to visitor expenditure in the park and in the local economy.
 - Consider a universal and low fee in conjunction with a donation box, clearly explaining the need for financial resources and the use to which they would be put, to which visitors can contribute.
- A large rise in entrance fee is not advocated. However, if a large rise is necessary, consider a series of smaller, incremental rises over a longer period of time. This will be more palatable to visitors, but must be combined with widespread notification.
- Consider consolidating some of the additional fee structures. In particular, (1) the entrance fee and Banu Nggulung walk fees could be combined, and (2) the ferry and local shuttle boat fees could be combined. This would alleviate visitor dissatisfaction and misunderstanding.
- Caution should be applied over the issue of retaining park revenues for management costs, particularly if it is likely to lead to a significant reduction in core government funding, and an increased reliance on tourism for income.
- Consider other forms of revenue and other charges which could be levied against either visitors or operators, and which could be retained, such as conservation or development funds. Contributions could be voluntary or compulsory.

The overriding conclusion is that KNP should establish an explicit pricing policy based upon a nationally agreed philosophy regarding the function of protected areas, and taking into account the effects of pricing policy on users, visitation patterns, the physical environment and the surrounding local economy. However, changes to the pricing policy must only be

made in the presence of wide consultation of stakeholders and detailed monitoring of its impacts.

10.5.3 Local Community Participation in Tourism

It is recognised that local participation in and benefits from KNP tourism could be substantially improved. Lindberg and Enriquez (1994) identify four factors which will affect the contribution of tourism to local economies;

- The marketability of the attraction,
- The type of tourist,
- The infrastructure/facilities, and
- The extent of local involvement and linkages.

The marketability of the attraction is uncontested. KNP is a world famous reserve with a unique and charismatic species, and foreign visitors will continue to be attracted in increasing numbers. However, different types of tourist have been shown to have different impacts in this case. In addition, the level of infrastructure and facilities will limit the opportunities that visitors have to spend money. Even given the opportunity to spend, the current situation involves the minimum of local linkages and involvement. Clearly, there are a number of ways in which local benefits could be improved;

- decrease leakages from (increase linkages with) the local economy,
- increase local involvement in the tourism industry, and
- increase tourist spending locally (or change the type of tourist visiting KNP).

The issue of raising the financial contribution of tourism was discussed at the workshop and a number of recommendations made (Table 10.5). The major recommendations were two-fold; increasing the contact which tourists have with the local economy, and increasing opportunities for tourists to spend. Of particular importance is the lack of opportunities for people living within the park to benefit from tourism. Training and development of small-scale projects, and a greater integration with the tourism developments within the park, would greatly improve the benefits which inhabitants of the park receive from tourism.

**Table 10.5 Recommendations Regarding Local Participation in Tourism to KNP
(Arising from the DICE/ODA Workshop on Sustainable Tourism, April 1996).**

- Labuan Bajo should be the centre for tourist transport to the island. The already established co-operative (Koperasi) should play more of a role in organising charter transport. Better quality boats, with improved safety facilities, are necessary for tourists.
- Training needs to be provided for local communities, particularly ecological knowledge and language skills for residents of Kampung Komodo, Kampung Rinca, and Labuan Bajo, so that they may become involved as quality tourist guides.
- Training should be provided in the making of tourist souvenirs, for residents of Kampung Komodo and Kampung Rinca.
- Residents of Kampung Komodo and Kampung Rinca should be involved in a service co-operative, and permitted to provide drinks and souvenirs to visitors in some capacity.
- The Labuan Bajo Guiding Association should start a licensing scheme to improve guiding standards and prevent unlicensed hawking.
- The Kader Konservasi should be involved in planning and management of tourism activities in the park.
- There should be increased tourist events in Labuan Bajo. Boat races, kite flying, and festivals should be organised.

There is clearly scope for increased involvement of local people in the tourism industry, and increased linkages between tourism and the local economy. The ideas presented here, generated in local discussion groups, provide some suggestions for how this may be achieved. Both the previous and current directors of KNP have expressed a commitment to increasing the benefits from park tourism for local people (Subijanto, *pers.comm.*; Hartono, *pers.comm.*), and future research should be aimed at implementing initiatives to achieve this end.

10.6 The Wider Implications of the Study

Ecotourism is both a philosophical ideology and a marketing label (Goodwin, 1996). It has been applied both to nature-based tourism as a set of guidelines to make it more sustainable, and as a means of selling it to 'discerning' clients. Although there is little firm evidence either way, it is unlikely that the concept of ecotourism as sustainable, nature-based tourism (Chapter 1) exists anywhere in practice.

This detailed examination of nature-based tourism in KNP concludes that it does not conform to the ideology of ecotourism. Were such an integrated examination of other 'ecotourism' sites to be undertaken, it is likely that they too would fall short of the ideals of ecotourism. Sites such as Monteverde Cloud Forest Preserve in Costa Rica, or Galapagos National Park in Ecuador, are frequently publicised as prime examples of ecotourism (Tindle, 1983; Aylward *et al.*, 1996). Tourism at these sites is perceived to be well managed and controlled, and the volumes of visitors to each are perceived to generate large amounts of revenue. However, they equate more to the marketers' ideal (unique, well-known, lucrative) than to the ideal of sustainability (ecologically sound, of benefit to conservation and providing equitable benefits for local people).

The main problems highlighted in this study, which will undoubtedly apply elsewhere, are twofold. Firstly, at an operational level, the interconnectedness of the economic, social and ecological facets of tourism are rarely recognised at a particular location. And secondly, on a temporal scale, tourism *evolves*, through growth and development, so that what may appear as ecotourism at one moment may rapidly change into something much less sustainable.

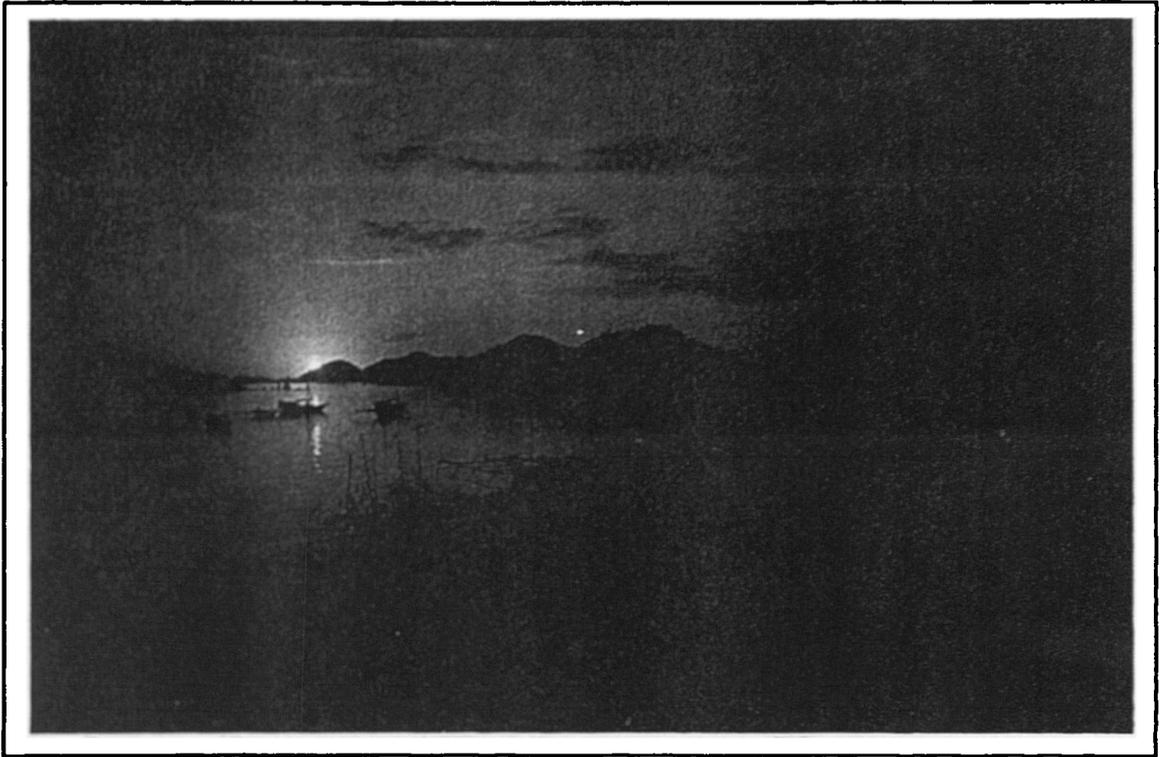
Whilst a particular form of tourism may appear to be ecotourism from one operational perspective, it may appear much less sustainable from another. Focusing purely on one perspective, be it ecological, economic or social, risks neglecting equally important concerns from other perspectives (de Kadt, 1994). For example, the cessation of provisioning of dragons, whilst shown to be an appropriate decision from an ecological perspective (Chapter 6), resulted in loss of revenue to the local village and may potentially reduce KNP entrance fee revenues. Similarly, focusing on gross expenditure and inputs from tourism may suggest that considerable benefits accrue to local communities, whilst it is clear from an assessment of distributional factors that tourism favours those of non-local origin, with capital to invest.

There is anecdotal evidence of similar problems in Galapagos National Park (Kenchington, 1989), and equivalent patterns are likely in other situations.

The second general problem is the direction in which tourism evolves (Butler, 1980; Keller, 1987). The political economy of tourism suggests that, as tourism develops, it assumes more of the features of traditional capitalist export industries (Britton, 1982). Whilst this study essentially provides a snapshot of a situation at a particular point in time, it has also provided evidence of change associated with tourism growth and development which would suggest movement away from sustainable ideals. Again, this is likely to be the case with many forms of 'ecotourism' in practice.

For sustainability to become more than a concept, it is necessary for continued evaluation to take place at every stage of the development process. This research is a first step in what aims to be a continued evaluation of tourism to KNP. Methods were developed and skills transferred so that local researchers working with KNP could continue to monitor tourism in order to provide continued practical information for planners and managers. Once recommendations and practical measures have been implemented, the next step in the research is longer-term evaluation of the results of these initiatives. It is hoped that other ecotourism sites can follow these integrated steps towards greater sustainability.

Sunset Over Labuan Bajo Harbour and the Islands of KNP.



REFERENCES

- Adams, J. S. and T. O. McShane (1992). *The myth of wild Africa: conservation without illusion*. W.W.Norton and Co., New York.
- ADB (1993). *Management and conservation of tropical forest ecosystems and biodiversity*. Asian Development Bank.
- Ahlund, M. and F. Gotmark (1989). Gull predation on eider ducks *Somateria mollissima*: effects of human disturbance. *Biol. Conserv.* 48: 115-27.
- Anderson, D. and R. Grove, Eds. (1987). *Conservation in Africa: people, policies and practice*, Cambridge University Press, Cambridge.
- Anderson, D. W. and J. O. Keith (1980). The human influence on seabird nesting success: conservation implications. *Biol. Conserv.* 18: 65-80.
- Anderson, S. H. (1995). Recreational disturbance and wildlife populations. In R. L. Knight and K. J. Gutzwiller, (Ed.), *Wildlife and recreationists: coexistence through management and research*. Island Press, Washington, D.C.: 355.
- Andronicou, A. (1979). Tourism in Cyprus. In E. de Kadt, (Ed.), *Tourism: passport to development*. Oxford University Press, London.
- Ap, J., T. Var and K. Din (1991). Malaysian perceptions of tourism. *Ann. Tourism Res.* 18(2): 321-3.
- Aspinall, R. J. and A. M. Pye (1987). The effect of trampling on limestone grassland in the Malham area of North Yorkshire. *J. Biogeog.* 14: 105-15.
- Atmosoedarjo, S., L. Daryadi, J. MacKinnon and P. Hillegers (1984). National parks and rural communities. In J. A. McNeely and K. R. Miller, (Ed.), *National parks, conservation and development: the role of protected areas in sustaining society*. Smithsonian Institution Press, Washington D.C.
- Auffenberg, W. (1981). *The behavioral ecology of the Komodo monitor*. University of Florida Press, Gainesville.
- Aylward, B., K. Allen, J. Echeverria and J. Tosi (1996) Sustainable ecotourism in Costa Rica: the Monteverde Cloud Forest Preserve. *Biodiv. Conserv.* 5(3):315-44.
- Bagus, I. G. N. (1986). *The value of the contribution of Balinese culture in the development of national culture*. Departemen Pendidikan dan Kebudayaan, Jakarta.
- Balakrishnan, M. and D. A. Ndhlovu (1992). Wildlife utilisation and local people: a case-study in Upper Lupande Game Management Area, Zambia. *Env. Conserv.* 19(2): 135-44.
- BAPPENAS (1993a). *Biodiversity Action Plan for Indonesia*. Ministry of national Development Planning (BAPPENAS), Jakarta.
- BAPPENAS (1993b). *Biodiversity Action Plan for Indonesia: Project Profile*. Ministry of national Development Planning (BAPPENAS), Jakarta.

- Barde, J.-P. and D. W. Pearce (1991). *Valuing the environment: six case studies*. Earthscan, London.
- Barrett, C. B. and P. Arcese (1995). Are integrated conservation-development projects (ICDPs) sustainable? On the conservation of large mammals in sub-Saharan Africa. *World Development* 23(7): 1073-84.
- Bayfield, N. (1979). Some effects of trampling on *Molophilus ater* (Meigen) (Diptera, Tipulidae). *Biol. Conserv.* 15: 219-232.
- Bell, K. L. and L. C. Bliss (1973). Alpine disturbance studies: Olympic National Park, USA. *Biol. Conserv.* 5(1): 25-32.
- Bell, R. H. V. (1987). Conservation with a human face: conflict and reconciliation in African land use planning. In D. Anderson and R. Grove, (Ed.), *Conservation in Africa: people, policies and practice*. Cambridge University Press, Cambridge: 355.
- Blane, J. M. and R. Jaakson (1994). The impact of ecotourism boats on the St Lawrence beluga whales. *Env. Conserv.* 21(3): 267-9.
- Blower, J. H., A. P. M. van der Zon and Y. Mulyana (1977). *Proposed Komodo National Park Management Plan, 1978-1982*. UNDP/FAO, Bogor.
- Boardman, R. (1981). *International organisation and the conservation of nature*. MacMillan Press Ltd., London.
- Boman, M. and G. Bostedt (1995). Valuing the wolf in Sweden: are benefits contingent upon the supply? In G. Bostedt, (Ed.), *Benefits of amenities in the forest environment: four papers based on contingent valuation*. Department of Forest Economics, Swedish University of Agricultural Sciences, Umea.
- Bonner, R. (1993). *At the hand of man: peril and hope for Africa's wildlife*. Simon and Schuster, London.
- Boo, E. (1990). *Ecotourism: the potentials and pitfalls*. World Wildlife Fund, Washington DC.
- Boo, E. (1992). *The ecotourism boom: planning for development and management*. WHN Technical Paper Series, no.2. World Wildlife Fund, Washington DC.
- Boucher, D. H., J. Aviles, R. Chepote, O. E. D. Gil and B. Vilchez (1991). Recovery of trailside vegetation from trampling in a tropical rainforest. *Env. Manag.* 15(2): 257-62.
- Bowles, A. E. (1995). Responses of wildlife to noise. In R. L. Knight and K. J. Gutzwiller, (Ed.), *Wildlife and recreationists: coexistence through management and research*. Island Press, Washington, D.C.: 355.
- Bowles, J. N. and M. A. Maun (1982). A study of the effects of trampling on the vegetation of Lake Huron sand dunes at Pinery Provincial Park. *Biol. Conserv.* 24: 273-83.
- Bradley, I. E. and J. B. South (1981). *Introductory statistics for business and economics*. Holt-Saunders, Tokyo.

- Britton, S. G. (1982). The political economy of tourism in the Third World. *Ann. Tourism Res.* 9: 331-58.
- Brohman, J. (1996). New directions in tourism for Third World development. *Ann. Tourism Res.* 23(1): 48-70.
- Brown, G. and W. Henry (1989). *The economic value of elephants*. Discussion Paper 89-12. London Environmental Economics Centre, London.
- Brown, M. and B. Wyckoff-Baird (1992). *Designing integrated conservation and development projects*. WWF/The Nature Conservancy/WRI.
- Bulmer, M. and D. P. Warwick, Eds. (1983). *Social research in developing countries: surveys and censuses in the Third World*, John Wiley & Sons, Chichester.
- Burden, R. F. and P. F. Randerson (1972). Quantitative studies of the effects of human trampling on vegetation as an aid to the management of semi-natural areas. *J. App. Ecol.* 9: 439-457.
- Burger, J. and M. Gochfeld (1993). Tourism and short-term behavioural responses of nesting masked, red-footed and blue-footed, boobies in the Galapagos. *Env. Conserv.* 20(3): 255-9.
- Burger, J., M. Gochfeld and L. J. Niles (1995). Ecotourism and birds in coastal New Jersey: contrasting responses of birds, tourists and managers. *Env. Conserv.* 22(1): 56-65.
- Butler, R. (1980). The concept of a tourist area cycle of evolution. *Canadian Geographer* 24: 5-12.
- Butler, R. (1994). Alternative tourism: the thin end of the wedge. In V. L. Smith and W. R. Eadington, (Ed.), *Tourism alternatives: potentials and problems in the development of tourism*. John Wiley & Sons, Chichester: 253.
- Cater, E. (1995). Environmental contradictions in sustainable tourism. *The Geographical Journal.* 161(1): 21-28.
- Cater, E. and G. Lowman, Eds. (1994). *Ecotourism: a sustainable option?*, John Wiley & Sons, Chichester.
- Catlin, G. (1989). *North American Indians*. Penguin, London.
- Cayford, J. (1993). Wader disturbance: a theoretical overview. *Wader Study Group Bull.* 68: 3-5.
- Ceballos-Lascurain, H. (1991). Tourism, ecotourism and protected areas. *parks* 2(3): 31-5.
- Ceballos-Lascurain, H. (1993). Ecotourism as a worldwide phenomenon. In K. Lindberg and D. E. Hawkins, (Ed.), *Ecotourism: a guide for planners and managers*. The Ecotourism Society, North Bennington, Vermont: 175.
- Chamberlain, A. (1910). Scenery as a national asset. *Outlook* 95(May 28, 1910): 169.
- Chambers, M. R., C. Santiapillai and N. Ishwaran (1983). Tourist activity and behaviour of the leopard *Panthera pardus fusca* (Meyer 1974) in the Ruhuna National Park, Sri Lanka. *J. Bombay. Nat. Hist. Soc.* 81: 42-48.

- Chambers, R. (1981). Rapid rural appraisal: rationale and repertoire. *Public Administration and development* 1(2): 95-106.
- Chambers, R. (1983). *Rural development: putting the last first*. Longman, London.
- Child, B. (1996). The practice and principles of community-based wildlife management in Zimbabwe: the CAMPFIRE programme. *Biodiv. Conserv.* 5(3): 369-98.
- Child, G. F. T. (1995). *Wildlife and people: the Zimbabwean success*. Wisdom Foundation, Harare and New York.
- Child, G. F. T. (1996). The role of community-based wild resource management in Zimbabwe. *Biodiv. Conserv.* 5(3): 355-68.
- Child, G. F. T. and R. A. Heath (1990). Underselling national parks in Zimbabwe: the implications for rural sustainability. *Society and Natural Resources* 3: 215-27.
- Clawson, M. and J. L. Knetch (1965). *Economics of outdoor recreation*. John Hopkins University Press, Baltimore.
- Coates, P. (1993). *In nature's defence: Americans and conservation*. Pamphlets in American Studies, 26. British Association for American Studies, Keele.
- Cochrane, J. (1992). *Environmental tourism potential of Lore Lindu National Park and Morowali Nature Reserve*. PHPA/TNC, Jakarta.
- Cochrane, J. (1993a). Tourism and conservation in Indonesia and Malaysia. In M. Hitchcock, V. T. King and M. Parnwell, (Ed.), *Tourism in South-East Asia*. Routledge, London.
- Cochrane, J. (1993b). *Gunung Leuser national park ecotourism survey*. Leuser Development Program, Jakarta.
- Cochrane, J. (1994). *Sustainable ecotourism in Indonesia: fact or fiction?* , unpublished report.
- Cohen, E. (1972). Towards a sociology of international tourism. *Social Research* 39: 164-72.
- Cole, D. N. (1995a). Experimental trampling of vegetation. I. Relationship between trampling intensity and vegetation response. *J. App. Ecol.* 32: 203-14.
- Cole, D. N. (1995b). Experimental trampling of vegetation. II. Predictors of resistance and resilience. *J. App. Ecol.* 32: 215-24.
- Cole, D. N. and P. B. Landres (1995). Indirect effects of recreationists on wildlife. In R. L. Knight and K. J. Gutzwiller, (Ed.), *Wildlife and recreationists: coexistence through management and research*. Island Press, Washington, D.C.: 355.
- Cole, D. N. and E. G. S. Schreiner (1981). *Impacts of back-country recreation: site management and rehabilitation - an annotated bibliography*. USDA Forest Service, Intermountain Forest and Range Experimental Station.
- Cooper, C. and S. Jackson (1989). Destination life cycle: the Isle of Man case study. *Ann. Tourism Res.* 16: 377-98.

- Corzine, R. (1996). Tourism emerges as a big income earner. *Gulf News*(December 16): 8-9.
- Cott, H. B. (1969). Tourists and crocodiles in Uganda. *Oryx* 10: 153-60.
- Craik, J. (1995). Are there cultural limits to tourism? *J. Sust. Tourism* 3(2): 87-98.
- Crawford, A. K. and M. J. Liddle (1977). The effect of trampling on neutral grassland. *Biol. Conserv.* 12: 135-42.
- Cukier-Snow, J. and G. Wall (1993). Tourism employment: perspectives from Bali. *Tourism Manag.* 14(3): 195-201.
- Cukier, J. and G. Wall (1994). Informal tourism employment: vendors in Bali, Indonesia. *Tourism Manag.* 15(6): 464-76.
- de Groot, R. S. (1983). Tourism and conservation in the Galapagos. *Biol. Conserv.* 26: 291-300.
- de Kadt, E. (1979). *Tourism: passport to development*. Oxford University Press, London.
- de Kadt, E. (1994). Making the alternative sustainable: lessons from the development of tourism. In V. L. Smith and W. R. Eadington, (Ed.), *Tourism alternatives: potentials and problems in the development of tourism*. John Wiley & Sons, Chichester: 253.
- Deschamps, V. (1992). Conservation education and awareness in Ujung Kulon National Park. *Conserv. Indonesia* 8(1): 11-13.
- Diamond, J. M. (1975). The island dilemma: lessons of modern biogeographic studies for the design of nature reserves. *Biol. Conserv.* 7: 3-15.
- Dias, G. (1992). A new project: Primary Environmental Care. *Conserv. Indonesia* 8(2): 10.
- Directorate General of Tourism (1993a). *Tourism in the 6th five year development plan, 1994 - 1998*. Directorate General of Tourism, Jakarta.
- Directorate General of Tourism (1993b). *Concept plan for national marketing strategy and national promotions in 6th five year plan, 1994/95 - 1998/99*. Directorate General of Tourism, Jakarta.
- DiSilvestro, R. L. (1993). *Reclaiming the last wild places: a new agenda for biodiversity*. John Wiley & Sons, Inc., New York.
- Dixon, J. A. and P. B. Sherman (1990). *Economics of protected areas: a new look at benefits and costs*. Island Press, Washington.
- Dixon, J. A. and P. B. Sherman (1991). Economics of protected areas. *AMBIO* 20(2): 68-74.
- Dixon, J., L. F. Scura and T. van't Hoft (1993). Meeting ecological and economic goals: marine parks in the Caribbean. *AMBIO* 22(2-3): 117-25.
- Djuwantoko (1996). Park management for community participation in Komodo National Park. (Ed.), *Proceedings of a workshop on sustainable tourism and biodiversity, Labuan Bajo, 2-4 April 1996*. DICE, unpublished report.

- Dogan, H. Z. (1989). Forms of adjustment: socio-cultural impacts of tourism. *Ann. Tourism Res.* 16: 216-36.
- Doxey, G. V. (1975). *A causation theory of visitor-resident irritants: methodology and research inference*. The Travel Research Association Conference no.6, San Diego.
- Driml, S. (1994). *Protection for profit: economic and financial values of the Great Barrier Reef World Heritage Area and other protected areas*. Research Publication No.35. Great Barrier Reef Marine Park Authority, Townsville.
- Duffey, E. (1975). The effects of human trampling on the fauna of grassland litter. *Biol. Conserv.* 7: 255-74.
- Duffus, D. A. and P. Dearden (1990). Non-consumptive wildlife-oriented recreation: a conceptual framework. *Biol. Conserv.* 53: 213-31.
- Eadington, W. R. and M. Redman (1991). Economics and tourism. *Ann. Tourism Res.* 18: 41-56.
- Edington, J. M. and M. A. Edington (1986). *Ecology, recreation and tourism*. Cambridge University Press, Cambridge.
- EIU (1991). Indonesia. *International Tourism Reports* 3.
- Ellen, R. F., Ed. (1984). *Ethnographic research: a guide to general conduct*, Academic Press, London.
- Evers, H.-D. and O. Mehmet (1994). The management of risk: informal trade in Indonesia. *World Development* 22(1): 1-9.
- Eyles, J. and D. M. Smith, Eds. (1988). *Qualitative methods in human geography*, Polity, Cambridge.
- Filion, F. L., J. P. Foley and A. J. Jacquemot (1992). *The economics of global ecotourism*. Paper presented at the IUCN IVth World Congress on Parks and Protected Areas, Caracas, Venezuela.
- Fox, A. D., T. A. Jones, R. Singleton and A. D. Q. Agnew (1994). Food supply and the effects of recreational disturbance on the abundance and distribution of wintering pochard on a gravel pit complex in southern Britain. *Hydrobiologia* 280: 253-61.
- Freeman, D. H. (1987). *Applied categorical data analysis*. Decker, New York.
- Freitag, T. G. (1994). Enclave tourism development: for whom the benefits roll? *Ann. Tourism Res.* 21(3): 538-554.
- Fujita, M. (1992). The Nature Conservancy in Indonesia. *Conserv. Indonesia* 8(2): 18.
- Gabrielson, G. W. and E. N. Smith (1995). Physiological responses of wildlife to disturbance. In R. L. Knight and K. J. Gutzwiller, (Ed.), *Wildlife and recreationists: coexistence through management and research*. Island Press, Washington, D.C.: 355.
- Garber, S. D. and J. Burger (1995). A 20-yr study documenting the relationship between turtle decline and human recreation. *Ecol. Apps.* 5(4): 1151-1162.

- Garratt, K. (1984). The relationship between adjacent lands and protected areas: issues of concern for the protected area manager. In J. A. McNeely and K. R. Miller, (Ed.), *National parks, conservation and development: the role of protected areas in sustaining society*. Smithsonian Institution Press, Washington D.C.
- Giannecchini, J. (1993). Ecotourism: new partners, new relationships. *Conserv. Biol.* 7(2): 429-32.
- Giongo, F., J. Bosco-Nizeye and G. N. Wallace (1993). *A study of visitor management in the World's national parks and protected areas*. Colorado State University.
- Goldsmith, F. B. (1983). Ecological effects of visitors and the restoration of damaged areas. In A. Warren and F. B. Goldsmith, (Ed.), *Conservation in perspective*. J. Wiley and Sons, Ltd., London.
- Goodrich, J. M. and J. Berger (1994). Winter recreation and hibernating black bears *Ursus americanus*. *Biol. Conserv.* 67: 105-10.
- Goodwin, H. (1996). In pursuit of ecotourism. *Biodiv. and Conserv.* 5(3): 277-292.
- Goodwin, H., I. J. Kent, M. J. Walpole and K. G. R. Ward (1995). *Interim report: Indonesia*. ODA, unpublished.
- Goodwin, H., I. J. Kent, K. T. Parker and M. J. Walpole (1996). *Proceedings of a Workshop on Sustainable Tourism and Biodiversity, 2-4 April 1996, Labuan Bajo, Indonesia*. ODA, unpublished.
- Goodwin, H., I. J. Kent, K. T. Parker and M. J. Walpole (1997a). *Tourism, conservation and sustainable development: volume I, Comparative Report*. ODA, unpublished
- Goodwin, H., I. J. Kent, K. T. Parker and M. J. Walpole (1997b). *Tourism, conservation and sustainable development: volume II, Keoladeo National Park, India*. ODA, unpublished
- Goodwin, H., I. J. Kent, K. T. Parker and M. J. Walpole (1997c). *Tourism, conservation and sustainable development: volume III, Komodo National Park, Indonesia*. ODA, unpublished
- Goodwin, H., I. J. Kent, K. T. Parker and M. J. Walpole (1997d). *Tourism, conservation and sustainable development: volume IV, the South-East Lowveld, Zimbabwe*. ODA, unpublished
- Government of Indonesia (1990a). *Act of the Republic of Indonesia (No. 5 of 1990) Concerning Conservation of Living Resources and Their Ecosystems*. Government of Indonesia, Jakarta.
- Government of Indonesia (1990b). *Act of the Republic of Indonesia (No. 9 of 1990) Concerning Tourism*. Government of Indonesia, Jakarta.
- Graefe, A. R., F. R. Kuss and J. J. Vaske (1990). *Visitor Impact Management: the planning framework*. National Parks and Conservation Association, Washington, DC.
- Groom, M., R. D. Podolsky and C. A. Munn (1991). Tourism as a sustained use of wildlife: a case study of Madre de Dios, South-eastern Peru. In J. G. Robinson and K. H. Redford, (Ed.), *Neotropical wildlife use and conservation*. , Chicago, University of Chicago Press.

- Grosvenor, M. B. (1966). Today and tomorrow in our national parks. *National Geographic* 130(1): 1-6.
- Grove, R. (1987). Early themes in African conservation: the Cape in the nineteenth century. In D. Anderson and R. Grove, (Ed.), *Conservation in Africa: people, policies and practice*. Cambridge University Press, Cambridge: 355.
- Gutzwiller, K. J. (1991). Assessing recreational impacts on wildlife: the value and design of experiments. *Trans. 56th North Am. Wildl. Nat. Res. Conf.*: 248-55.
- Gutzwiller, K. J. (1995). Recreational disturbance and wildlife communities. In R. L. Knight and K. J. Gutzwiller, (Ed.), *Wildlife and recreationists: coexistence through management and research*. Island Press, Washington, D.C.: 355.
- Hales, D. (1989). Changing concepts of national parks. In D. Western and M. C. Pearl, (Ed.), *Conservation for the 21st Century*. Oxford University Press, New York and Oxford: 365.
- Hand, J. L. (1980). Human disturbance in western gulls *Larus occidentalis livens* colonies and possible amplification by intraspecific predation. *Biol. Conserv.* 18: 59-63.
- Hanemann, W. M., J. B. Loomis and B. J. Kanninen (1991). Statistical efficiency of double-bounded dichotomous choice contingent valuation. *Am. J. Agric. Econ.* 73(4): 1255-63.
- Harrison, C. (1981). Recovery of lowland grassland and heathland in southern England from disturbance by seasonal trampling. *Biol. Conserv.* 19: 119-30.
- Hartup, B. K. (1994). Community conservation in Belize: demography, resource use, and attitudes of participating landowners. *Biol. Conserv.* 69: 235-41.
- Hays, S. P. (1959). *Conservation and the gospel of efficiency: the progressive conservation movement, 1890-1920*. Harvard University Press, Cambridge, Mass.
- Haysmith, L. and J. D. Hunt (1995). Nature tourism: impacts and management. In R. L. Knight and K. J. Gutzwiller, (Ed.), *Wildlife and recreationists: coexistence through management and research*. Island Press, Washington, D.C.: 355.
- Healy, R. G. (1994). 'Tourism merchandise' as a means of generating local benefits from ecotourism. *J. Sust. Tourism* 2(3): 137-51.
- Henry, W. R. (1980). *Relationships between visitor use and tourist capacity for Kenya's Amboseli National Park*. Colorado State University, Fort Collins, Colorado.
- Hitchcock, M. (1993). Dragon tourism in Komodo, Indonesia. In M. Hitchcock, V. T. King and M. Parnwell, (Ed.), *Tourism in South-East Asia*. Routledge, London.
- Hoevenagel, R. (1990). *The validity of the contingent valuation method. Some aspects on the basis of three Dutch studies*. Paper presented at the congress 'Environmental Cooperation and policy in the Single European Market', April 17-20, Venice.
- Holthus, P. (1995). *A rapid ecological assessment of the marine environment of Komodo National Park*. TNC, Jakarta.
- Homewood, K. M. and W. A. Rodgers (1991). *Maasailand ecology: pastoralist development and wildlife conservation in Ngorongoro, Tanzania*. Cambridge University Press, Cambridge.

- Hulbert, I. A. R. (1990). The response of ruddy shelduck *Tadorna ferruginea* to tourist activity in the Royal Chitwan National Park of Nepal. *Biol. Conserv.* 52: 113-23.
- Hylgaard, T. and M. J. Liddle (1981). The effect of human trampling on a sand dune ecosystem dominated by *Empetrum nigrum*. *J. App. Ecol.* 18: 559-69.
- IIED (1994a). *Economic evaluation of tropical forest land use options: a review of methodology and applications*. IIED, unpublished draft, London.
- IIED (1994b). *Whose Eden? An overview of community approaches to wildlife management*. IIED/ODA, London.
- IMF (1997). *Financial Statistics*. IMF, January 1997.
- Inceoglu, N., Z. Abali and M. Inceoglu (1994). Public responses to an endangered environmental resource. *Ann. Tourism Res.* 21(2): 392-5.
- IRG (1986). *Preliminary proposal for a study of integrated nature and wildlife tourism development in Indonesia*. IRG, unpublished.
- IUCN (1992). *Protected areas of the world: a review of national systems. Volume 1: Indomalaya, Oceania, Australia and Antarctic*. IUCN, Gland, Switzerland and Cambridge, UK.
- IUCN (1994). *Guidelines for protected area management categories*. IUCN, Cambridge, UK and Gland, Switzerland.
- IUCN (1996). *Red list of threatened animals*. IUCN, Gland.
- IUCN/UNEP/WWF (1980). *World Conservation Strategy: Living resource conservation for sustainable development*. IUCN/UNEP/WWF, Gland, Switzerland.
- Jakobsson, K. M. and A. K. Dragun (1996). *Contingent valuation and endangered species: methodological issues and applications*. Edward Elgar, Cheltenham.
- Jansen, D. (1993). *Investigation and recommendations on access, pricing and control over resources and services of DNPWLM*. DNPWLM, Harare.
- Jenner, P. and C. Smith (1992). *The tourism industry and the Environment*. Special Report, 2453. Economics Intelligence Unit, London.
- Jim, C. Y. (1987). Trampling impacts of recreationists on picnic sites in a Hong Kong country park. *Env. Conserv.* 14(2): 117-27.
- Johns, B. G. (1996). Responses of chimpanzees to habituation and tourism in the Kibale Forest, Uganda. *Biol. Conserv.* 78: 257-62.
- Kayanja, F. and I. Douglas-Hamilton (1984). The impact of the unexpected on the Uganda national parks. In J. A. McNeely and K. R. Miller, (Ed.), *National parks, conservation and development: the role of protected areas in sustaining society*. Smithsonian Institution Press, Washington D.C.
- Keller, P. C. (1987). Stages of peripheral tourism development: Canada's Northwest Territories. *Tourism Manag.* 8(1): 20-32.

- Keller, V. E. (1991). Effects of human disturbance on eider ducklings *Somateria mollissima* in an estuarine habitat in Scotland. *Biol. Conserv.* 58: 213-28.
- Kenchington, R.A. (1989). Tourism in the Galapagos Islands: the dilemma of conservation. *Env. Conserv.* 16(3):227-32.
- Khan, A. A. (1985). The development of a protected area system in Pakistan in terms of representative coverage of ecotypes. In J. W. Thorsell, (Ed.), *Conserving Asia's natural heritage: the planning and management of protected areas in the Indomalayan realm*. IUCN, Gland.
- Khan, M. A. R. (1985). Future conservation directions for Bangladesh. In J. W. Thorsell, (Ed.), *Conserving Asia's natural heritage: the planning and management of protected areas in the Indomalayan realm*. IUCN, Gland.
- Khan, M. K. b. M. (1985). Peninsula Malaysia's efforts to create a system of nature reserves. In J. W. Thorsell, (Ed.), *Conserving Asia's natural heritage: the planning and management of protected areas in the Indomalayan realm*. IUCN, Gland.
- King, D. A. and W. P. Stewart (1996). Ecotourism and commodification: protecting people and places. *Biodiv. Conserv.* 5(3): 293-305.
- Kinnaird, M. F. and T. G. O'Brien (1996). Ecotourism in the Tangkoko-Dua Saudara Nature Reserve: opening Pandora's box? *Oryx*.
- Kiss, A., Ed. (1990). *Living with wildlife: wildlife resource management with local participation in Africa*, Technical paper 130, World Bank, Washington, DC.
- Klein, M. L., S. R. Humphrey and H. F. Percival (1995). Effects of ecotourism on distribution of waterbirds in a wildlife refuge. *Conserv. Biol.* 9(6): 1454-65.
- Knight, R. L. and D. N. Cole (1995a). Wildlife responses to recreationists. In R. L. Knight and K. J. Gutzwiller, (Ed.), *Wildlife and recreationists: coexistence through management and research*. Island Press, Washington, D.C.: 355.
- Knight, R. L. and D. N. Cole (1995b). Factors that influence wildlife responses to recreationists. In R. L. Knight and K. J. Gutzwiller, (Ed.), *Wildlife and recreationists: coexistence through management and research*. Island Press, Washington, D.C.: 355.
- Knight, R. L. and K. J. Gutzwiller, Eds. (1995). *Wildlife and recreationists: coexistence through management and research*, Island Press, Washington, D.C.
- Knight, R. L. and S. A. Temple (1995). Origin of wildlife responses to recreationists. In R. L. Knight and K. J. Gutzwiller, (Ed.), *Wildlife and recreationists: coexistence through management and research*. Island Press, Washington, D.C.: 355.
- Kokai, M. K. (1992). Why Maasai Mara is the most visited reserve in East Africa. In C. G. Gakahu, (Ed.), *Tourist attitudes and use impacts in Maasai Mara National Reserve: proceedings of a workshop at MMNR, March 1991*. Wildlife Conservation International, Nairobi.
- Kottke, M. (1988). Estimating economic impacts of tourism. *Ann. Tourism Res.* 15: 122-33.

- Krippendorf, J. (1987). *The holiday makers: understanding the impact of leisure and travel*. Heinemann, Oxford.
- Kury, C. R. and M. Gochfeld (1975). Human interference and gull predation in cormorant colonies. *Biol. Conserv.* 8: 23-34.
- Kuss, F. R. (1986). A review of major factors influencing plant responses to recreation impacts. *Env. Manag.* 10: 637-50.
- Laarman, J. G. and H. M. Gregersen (1996). Pricing policy in nature-based tourism. *Tourism Manag.* 17(4): 247-54.
- Lea, J. P. (1988). *Tourism and development in the Third World*. Routledge, London and New York.
- Lea, J. P. (1993). Tourism development ethics in the Third World. *Ann. Tourism Res.* 20: 701-15.
- Leader-Williams, N., J. Harrison and M. J. B. Green (1990). Designing protected areas to conserve natural resources. *Science Progress* 74: 189-204.
- Lechoncito, J. L. (1985). The development of a protected area system in the Philippines in terms of representative coverage of ecotypes. In J. W. Thorsell, (Ed.), *Conserving Asia's natural heritage: the planning and management of protected areas in the Indomalayan realm*. IUCN, Gland.
- Lehmkuhl, J. F., R. K. Upreti and U. R. Sharma (1988). National parks and local development: grasses and people in Royal Chitwan National Park, Nepal. *Environ. Conserv.* 15: 143-8.
- Leopold, A. (1949). *A Sand County Almanac*. Oxford University Press, New York.
- Leopold, A. S. (1963). Wildlife management in the national parks. *National Parks Magazine* 37.
- Liddle, M. J. (1975). A theoretical relationship between the primary productivity of vegetation and its ability to tolerate trampling. *Biol. Conserv.* 8: 251-255.
- Lilley, R. P. H. (1995). *A feasibility study on the in-situ captive breeding of Komodo dragons (Varanus komodoensis) on Padar Island, Komodo National Park*. Unpublished MSc thesis, DICE. University of Kent, Canterbury.
- Lindberg, K. and J. Enriquez (1994). *An analysis of ecotourism's economic contribution to conservation and development in Belize*. WWF (US) and the Ministry of Tourism and Environment, Belize.
- Lindberg, K. and D. E. Hawkins, Eds. (1993). *Ecotourism: a guide for planners and managers*, The Ecotourism Society, North Bennington, Vermont.
- Long, V. and G. Wall (1996). Successful tourism in Nusa Lembongan, Indonesia? *Tourism Manag.* 17(1): 43-50.
- Lonsdale, W. M. and A. M. Lane (1994). Tourist vehicles as vectors of weeds in Kakadu National Park, Northern Australia. *Biol. Conserv.* 69: 277-83.

- Lott, D. F. and M. McCoy (1995). Asian rhinos *Rhinoceros unicornis* on the run? Impact of tourist visits on one population. *Biol. Conserv.* 73: 23-6.
- Macewen, A. and M. Macewen (1982). *National Parks: conservation or cosmetics?* The Resource Management Series. George Allen and Unwin, London.
- Machlis, G. E. and D. L. Tichnell (1985). *The state of the world's parks: an international assessment for resource management, policy and research.* Westview Press, Boulder, Colorado.
- MacKenzie, J. M. (1987). chivalry, social Darwinism and ritualised killing: the hunting ethos in Central Africa up to 1914. In D. Anderson and R. Grove, (Ed.), *Conservation in Africa: people, policies and practice.* Cambridge University Press, Cambridge: 355.
- MacKenzie, J. M. (1988). *The empire of nature: hunting, conservation and British imperialism.* Studies in Imperialism. Manchester University Press, Manchester & New York.
- MacKinnon, J., K. MacKinnon, G. Child and J. Thorsell (1986). *Managing protected areas in the tropics.* IUCN, Gland, Switzerland.
- Madsen, J. (1994). Impacts of disturbance on migratory waterfowl. *Ibis* 137: 67-74.
- Mahat, G. (1985). Protected areas of Bhutan. In J. W. Thorsell, (Ed.), *Conserving Asia's natural heritage: the planning and management of protected areas in the Indomalayan realm.* IUCN, Gland.
- Maille, P. and R. Mendelsohn (1993). Valuing ecotourism in Madagascar. *J. Env. Manag.* 38: 213-8.
- Makombe, K. (1993). *Sharing the land: wildlife, people and development in Africa.* IUCN Regional Office for Southern Africa, Harare.
- Malik, A. (1984). Protected areas and political reality. In J. A. McNeely and K. R. Miller, (Ed.), *National parks, conservation and development: the role of protected areas in sustaining society.* Smithsonian Institution Press, Washington D.C.
- Malik, R. (1996). Marine ecotourism development in and around Komodo National Park. (Ed.), *Proceedings of a workshop on sustainable tourism and biodiversity, Labuan Bajo, 2-4 April 1996.* DICE, unpublished report.
- Mansperger, M. C. (1995). Tourism and cultural change in small-scale societies. *Human Organisation* 54(1): 87-94.
- Mathieson, A. and G. Wall (1982). *Tourism: economic, physical and social impacts.* Longman, Harlow.
- May, T. (1993). *Social research: issues, methods and progress.* Open University Press, Buckingham.
- McCool, S. F. (1990). Limits of Acceptable Change: evolution and future. (Ed.), *Towards serving visitors and managing our resources. Proceedings of a North American workshop on visitor management in parks and protected areas.* Tourism Research and Education Centre, University of Waterloo.

- McDonnell, M. J. (1981). Trampling effects on coastal dune vegetation in the Parker River National Wildlife Refuge, Massachusetts, USA. *Biol. Conserv.* 21: 289-301.
- McDougal, C. (1980). Some observations on tiger behaviour in the context of baiting. *J. Bombay. Nat. Hist. Soc.* 77: 476-485.
- McFarland, J. H. (1909). *Letter to Gifford Pinchot*. McFarland Papers, Box 16, William Penn Memorial Museum, Pennsylvania.
- McHenry, R. and C. Van Doren (1972). *A documentary history of conservation in America*. Praeger Publishers, New York.
- McNeely, J. A. (1984). Protected areas are adapting to new realities. In J. A. McNeely and K. R. Miller, (Ed.), *National parks, conservation and development: the role of protected areas in sustaining society*. Smithsonian Institution Press, Washington D.C.
- McNeely, J. A. (1988). *Economics and biological diversity: developing and using economic incentives to conserve biological resources*. IUCN, Gland, Switzerland.
- McNeely, J. A. (1989). Protected areas and human ecology: how national parks can contribute to sustaining societies in the 21st century. In D. Western and M. C. Pearl, (Ed.), *Conservation for the 21st century*. Oxford University Press, New York and Oxford: 365.
- McNeely, J. A. (1992). The biodiversity crisis: challenges for research and management. In O. T. Sandlund, K. Hindar and A. H. D. Brown, (Ed.), *Conservation of biodiversity for sustainable development*. Scandinavian University Press, Oslo: 324.
- McNeely, J. A., Ed. (1993). *Parks for life: report of the IVth World Congress on National Parks and Protected Areas, 10-21 February 1992*, IUCN, Gland.
- McNeely, J. A. and K. R. Miller, Eds. (1984). *National parks, conservation and development: the role of protected areas in sustaining society*. Proceedings of the World Congress on National Parks, Bali, Indonesia, 11-22 October, 1982, Smithsonian Institution Press, Washington D.C.
- McShane, T. O. (1990). Wildlands and Human Needs: resource use in an African protected area. *Landscape and Urban Planning* 19: 145-58.
- Metcalf, D. (1996). *Questioning and analysing German tour operators and tourists with reference to DICE's Tourism, Conservation and Sustainable Development Unit's projects in India, Indonesia and Zimbabwe Gonarezhou*. Institute of Mathematics and Statistics. University of Kent, Canterbury.
- Mitchell, J. G. (1994). Our National Parks: legacy at risk. *National Geographic* 186(4): 2-55.
- Mitchell, R. C. and R. T. Carson (1989). *Using surveys to value public goods: the contingent valuation method*. Resources for the Future, Washington DC.
- Mkanda, F. X. and S. M. Munthali (1994). Public attitudes and needs around Kasungu National Park, Malawi. *Biodiv. Conserv.* 3: 29-44.
- Moran, D. (1994). Contingent valuation and biodiversity: measuring the user surplus of Kenyan protected areas. *Biodiv. Conserv.* 3: 663-84.

- Movcan, J. (1982). Development and economics in Plitvice National Park. *AMBIO* 11(5): 282-5.
- Muir, J. (1898). The Wild Parks and Forest Reservations of the West. *Atlantic Monthly* 81(January 1898): 15.
- Munasinghe, M. (1992). Biodiversity protection policy: environmental valuation and distribution issues. *AMBIO* 21(3): 227-36.
- Mustika, Y. (1994). Laying the foundations for community awareness around Tangoko-Dua Saudara Nature Reserve. *Conserv. Indonesia* 10(2): 23-6.
- Muthee, L. W. (1992). Ecological impacts of tourist use on habitats and pressure point species. In C. G. Gakahu, (Ed.), *Tourist attitudes and use impacts in Maasai Mara National Reserve: proceedings of a workshop at MMNR, March 1991*. Wildlife Conservation International, Nairobi.
- Nash, R. (1982). *Wilderness and the American mind*. Yale University Press, New Haven.
- Nepal, S. K. and K. E. Weber (1995). Prospects for coexistence: wildlife and local people. *AMBIO* 24(2): 238-45.
- Newmark, W. D., N. L. Leonard, H. I. Sariko and D.-G. M. Gamassa (1993). Conservation attitudes of local people living adjacent to five protected areas in Tanzania. *Biol. Conserv.* 63: 177-83.
- Olokesusi, F. (1990). Assessment of the Yankari Game Reserve, Nigeria. *Tourism Manag.* 11(2): 153-62.
- Onyeausi, A. E. (1986). Measurements of impact of off-road driving on grasslands in Maasai Mara National Reserve, Kenya: a simulation approach. *Env. Conserv.* 13(4): 325-29.
- Orams, M. B. (1995). Towards a more desirable form of ecotourism. *Tourism Manag.* 16(1): 3-8.
- Patterson, K. (1992). *Tourism's negative impact on native Hawaiians*. ITB, Berlin.
- Pearce, D. G. (1981). *Tourism Development*. Longman, London.
- Pearce, D. W. (1976). *Environmental economics*. Longman, London and New York.
- Pearce, D. W. and R. K. Turner (1990). *Economics of natural resources and the environment*. Harvester Wheatsheaf, New York and London.
- Pearce, F. (1995). Selling wildlife short. *New Scientist*(2nd September): 28-31.
- Pendleton, L. H. (1993). Toward valuation of protection in a Caribbean coral reef: a bio-economic study of environmental change in the Bay Islands, Honduras. *TRI news*(Fall 1993): 40-2.
- Pet, J. and R. Djohani (1996). *Action plan for management of the marine resources of Komodo National Park and surrounding fishing grounds in Eastern Indonesia*. TNC, Jakarta.

Pierce, G. J., C. J. Spray and E. Stuart (1993). The effect of fishing on the distribution and behaviour of waterbirds in the Kukut area of Lake Songkla, southern Thailand. *Biol. Conserv.* 66: 23-34.

Pimbert, M. P. and J. N. Pretty (1995a). *Parks, people and professionals: putting 'participation' into protected area management.* Discussion Paper DP57. UNRISD/IIED/WWF.

Pimbert, M. P. and J. N. Pretty (1995b). Beyond conservation ideology and the wilderness myth. *Natural Resources Forum* 19(1): 5-14.

Pinchot, G. (1910). *The fight for conservation.* Doubleday, Page and Co., New York.

Pizam, A. and J. Pokela (1978). *Businessmen and residents' perceptions of tourism's impacts: analysis and implications for tourism policymaking.* Mugla School of Business Administration, Ankara, Turkey.

Place, S. E. (1991). Nature tourism and rural development in Tortuguero. *Ann. Tourism Res.* 18: 186-201.

Pleumaron, A. (1994). The political economy of tourism. *Ecologist* 24(4): 142-7.

Plog, S. C. (1973). Why destination areas rise and fall in popularity. *Cornell Hotel and Restaurant Association Quarterly* 13: 13-6.

Potts, F. C., H. J. Goodwin and M. J. Walpole (1996). People, wildlife and tourism in and around Hwange National Park, Zimbabwe. In M. F. Price, (Ed.), *People and tourism in fragile environments.* John Wiley & Sons, Chichester: 238.

Preece, N., P. van Oosterzee and D. James (1995). *Biodiversity conservation and ecotourism: an investigation of linkages, mutual benefits and future opportunities.* Biodiversity Unit, Department of the Environment, Sport and Territories, Canberra, Australia.

Prosser, R. (1994). Societal change and the growth in alternative tourism. In E. Cater and G. Lowman, (Ed.), *Ecotourism: a sustainable option?* John Wiley & Sons, Chichester: 218.

Pye, E. A. and T. Lin, Eds. (1983). *Tourism in Asia: the economic impact,* Singapore University Press, Singapore.

Quy, V. (1985). Rare species and protection measures proposed for Vietnam. In J. W. Thorsell, (Ed.), *Conserving Asia's natural heritage: the planning and management of protected areas in the Indomalayan realm.* IUCN, Gland.

Ranjitsingh, M. K. (1984). The Indomalayan realm. In J. A. McNeely and K. R. Miller, (Ed.), *National parks, conservation and development: the role of protected areas in sustaining society.* Smithsonian Institution Press, Washington D.C.

Ritchie, J. R. and M. Zins (1978). Culture as a determinant of the attractiveness of a tourist region. *Ann. Tourism Res.* 5: 252-70.

Roberts, J. T. (1995). Trickle down and scrambling up: the informal sector, food provisioning and local benefits of the Carajas mining 'growth pole' in the Brazilian Amazon. *World Development* 23(3): 385-400.

- Robinson, A. H. and A. Bari (1982). Komodo National Park: progress and problems. *Parks* 7(2): 10-12.
- Robinson, A. H. and E. A. Sumardja (1990). Indonesia. In C. W. Allin, (Ed.), *International handbook of national parks and nature reserves*. Greenwood Press.
- Robinson, A. H., D. Supriadi and Anwar (1982). *Komodo National Park: revision to the management plan, 1983/84 - 1985/86*. UNDP/FAO, Denpasar.
- Robson, C. (1993). *Real world research*. Blackwells, Oxford.
- Roe, D., N. Leader-Williams and B. Dalal-Clayton (1997). *The environmental impacts of wildlife tourism: a review of the literature*. ODA, London.
- Runte, A. (1987). *National Parks: the American experience*. University of Nebraska Press, Lincoln and London.
- Ryan, C. (1991). *Recreational tourism: a social science perspective*. Routledge, London and New York.
- Samarasekara, V. N. (1996). *Local perceptions of environmental change in a tropical coastal wetland: the case of Koggala Lagoon, Galle, Sri Lanka*. PhD thesis, School of Oriental and African studies. University of London, London.
- Scace, R. C., E. Grifone and R. Usher (1992). *Ecotourism in Canada*. Canadian Environmental Advisory Council, Ottawa.
- Schweithelm, J., N. Wirawan, J. Elliot and A. Khan (1992). *Sulawesi Parks Program: land use and socio-economic survey of Lore Lindu National Park and Morowali Nature Reserve*. PHPA/TNC, Jakarta.
- Shackley, M. (1996). Community impact of the camel safari industry in Jaisalmar, Rajasthan. *Tourism Manag.* 17(3): 213-8.
- Shafer, E. L., R. Carline, R. W. Guldin and H. K. Cordell (1993). Economic amenity values of wildlife: six case studies in Pennsylvania. *Environ. Manag.* 17(5): 669-82.
- Shipman, M. D. (1981). *The limitations of social research*. Longman, London & New York.
- Sinclair, M. T. (1991). The economics of tourism. *Progress in Tourism, Recreation and Hospitality Management* 3: 1-27.
- Singh, S. (1985a). Protected areas in India. In J. W. Thorsell, (Ed.), *Conserving Asia's natural heritage: the planning and management of protected areas in the Indomalayan realm*. IUCN, Gland.
- Singh, S. (1985b). An overview of the conservation status of the national parks and protected areas of the Indomalayan realm. In J. W. Thorsell, (Ed.), *Conserving Asia's natural heritage: the planning and management of protected areas in the Indomalayan realm*. IUCN, Gland.
- Smith, S. L. J. (1989). *Tourism analysis: a handbook*. Longman, Harlow.
- Smith, V. L. and W. R. Eadington, Eds. (1994). *Tourism Alternatives: potentials and problems in the development of tourism*, John Wiley & Sons, Chichester.

- Soule, M. E. (1986). *Conservation biology: the science of scarcity and diversity*. Sinauer, Sunderland, Mass.
- Soule, M. E. and D. Simberloff (1986). What do genetics and ecology tell us about the design of nature reserves? *Biol. Conserv.* 35: 19-40.
- Speight, M. C. D. (1973). *Outdoor recreation and its ecological effects: a bibliography and review*. Discussion Papers in Conservation, No.4. University College, London.
- Stankey, G. H., D. N. Cole, R. C. Lucas, M. E. Petersen and S. S. Frissell (1985). *The Limits of Acceptable Change (LAC) system for wilderness planning*. USDA Forest Service. Intermountain Forest and Range Experiment Station, Ogden, Utah.
- Steele, P. (1993). The economics of ecotourism. *In Focus* 9: 4-6.
- Stephenson, P. J. (1990). The impacts of tourism on nature reserves in Madagascar: Perinet, a case study. *Env. Conserv.*: 262-265.
- Studsrod, J. E. and P. Wegge (1995). Park-people relationships: the case of damage caused by park animals around the Royal Bardia National Park, Nepal. *Environ. Conserv.* 22(2): 133-42.
- Subijanto, J. (1996). The development and management of Komodo National Park. (Ed.), *Proceedings of a workshop on sustainable tourism and biodiversity, Labuan Bajo, 2-4 April 1996*. DICE, unpublished report.
- Sudibyo (1995a). *Socio-economic survey report of villages located within Komodo National Park, East Nusa Tenggara, Indonesia*. PHPA/TNC, Jakarta.
- Sudibyo (1995b). *Socio-economic survey report of neighbouring villages of Komodo National Park, East Nusa Tenggara, Indonesia*. PHPA/TNC, Jakarta.
- Sumardja, E. A. (1981). First five national parks in Indonesia. *Parks* 6: 4.
- Sumardja, E. A., Harsono and J. MacKinnon (1984a). Indonesia's network of protected areas. In J. A. McNeely and K. R. Miller, (Ed.), *National parks, conservation and development: the role of protected areas in sustaining society*. Smithsonian Institution Press, Washington D.C.
- Sumardja, E. A., Tarmudji and J. Wind (1984b). Nature conservation and rice production in the Dumoga Area, North Sulawesi, Indonesia. In J. A. McNeely and K. R. Miller, (Ed.), *National parks, conservation and development: the role of protected areas in sustaining society*. Smithsonian Institution Press, Washington D.C.
- Sun, D. and M. J. Liddle (1993). A survey of trampling effects on vegetation and soil in eight tropical and subtropical sites. *Env. Manag.* 17(4): 497-510.
- Swain, M. B. (1995). Gender in tourism. *Ann. Tourism Res.* 22(2): 247-66.
- Swanson, T., Ed. (1995). *The economics and ecology of biodiversity decline: the forces driving global change*, Cambridge University Press, Cambridge.
- Swanson, T. M. and E. B. Barbier, Eds. (1992). *Economics for the wilds: wildlife, wildlands, diversity and development*, Earthscan, London.

- Tabachnick, B. G. and L. S. Fidell (1989). *Using multivariate statistics*. Harper Collins, New York.
- Talbot, L. M. (1984). The role of protected areas in the implementation of the World Conservation Strategy. In J. A. McNeely and K. R. Miller, (Ed.), *National parks, conservation and development: the role of protected areas in sustaining society*. Smithsonian Institution Press, Washington D.C.
- Thorsell, J. W. (1985). *Conserving Asia's natural heritage: the planning and management of protected areas in the Indomalayan realm*. Proceedings of the 25th working session of IUCN's Committee for National Parks and Protected Areas, Corbett National Park, India, 4-8 February, 1985, IUCN, Gland.
- Tickell, C. (1994). Foreward. In E. Cater and G. Lowman, (Ed.), *Ecotourism: a sustainable option?* John Wiley & Sons, Chichester: 218.
- Tindle, R.W. (1983). Galapagos conservation and tourism - 11 years on. *Oryx* 17(3):127-9.
- TNK (1994a). *Inventarisasi dan penilaian potensi Komodo di Pulau Komodo - Taman Nasional Komodo*. TNK, Labuan Bajo, unpublished report.
- TNK (1994b). *Inventarisasi dan penilaian potensi Komodo di Pulau Rinca - Taman Nasional Komodo*. TNK, Labuan Bajo, unpublished report.
- TNK (1995). *Inventarisasi Komodo di Pulau Rinca - Taman Nasional Komodo*. TNK, Labuan Bajo, unpublished report.
- TNK (1996). *Inventarisasi Komodo di P.Komodo - Taman Nasional Komodo*. TNK, Labuan Bajo, unpublished report.
- Tobias, D. and R. Mendelsohn (1991). Valuing ecotourism in a tropical rain-forest reserve. *AMBIO* 20(2): 91-3.
- Tsartas, P. (1992). Socio-economic impacts of tourism on two Greek isles. *Ann. Tourism Res.* 19: 516-33.
- Tuite, C. H., P. R. Hanson and M. Owen (1984). Some ecological factors affecting winter wildfowl distribution on inland waters in England and Wales, and the influence of water-based recreation. *J. App. Ecol.* 21: 41-62.
- Tyack, B. (1996). *Baboons: too close for comfort?* Survival Anglia Ltd., Norwich.
- Udvardy, M. D. F. (1984). A biogeographical classification system for terrestrial environments. In J. A. McNeely and K. R. Miller, (Ed.), *National parks, conservation and development: the role of protected areas in sustaining society*. Smithsonian Institution Press, Washington D.C.
- Upreti, B. N. (1985). The development of a protected area system in Nepal. In J. W. Thorsell, (Ed.), *Conserving Asia's natural heritage: the planning and management of protected areas in the Indomalayan realm*. IUCN, Gland.
- USDA (1994). *Recommended improvements to visitor services at Komodo National Park*. USDA/PHPA.

- van der Zande, A. N., J. C. Berkhuisen, H. C. van Latesteijn, W. J. ter Keurs and A. J. Poppelaars (1984). Impact of outdoor recreation on the density of a number of breeding bird species in woods adjacent to urban residential areas. *Biol. Conserv.* 30(30).
- van Trung, T. (1985). The development of a protected area system in Vietnam. In J. W. Thorsell, (Ed.), *Conserving Asia's natural heritage: the planning and management of protected areas in the Indomalayan realm*. IUCN, Gland.
- Vaske, J. J., D. J. Decker and M. J. Manfredo (1995). Human dimensions of wildlife management: an integrated framework for coexistence. In R. L. Knight and K. J. Gutzwiller, (Ed.), *Wildlife and recreationists: coexistence through management and research*. Island Press, Washington, D.C.: 355.
- Vejaboosakorn, S. (1985). The development of a protected area system for Thailand in terms of representative coverage of ecotypes. In J. W. Thorsell, (Ed.), *Conserving Asia's natural heritage: the planning and management of protected areas in the Indomalayan realm*. IUCN, Gland.
- Verheijen, J. A. J. (1982). *Komodo: het eiland, het folk en de taal*. Martinus Nijhoff, The Hague.
- von Loebenstein, K., A. Trix and T. Welte (1993). *Compensation and reconciliation of interests in the field of buffer zone development*. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, Bonn.
- Wall, G. (1994). Ecotourism: old wine in new bottles? *Trends* 31(2): 4-9.
- Wall, G. (1996). Perspectives on tourism in selected Balinese villages. *Ann. Tourism Res.* 23(1): 123-37.
- Wall, G. and C. Wright (1977). *The environmental impact of outdoor recreation*. Department of Geography Series No.11. University of Waterloo, Waterloo, Canada.
- Warwick, D. P. (1983). On methodological integration in social research. In M. Bulmer and D. P. Warwick, (Ed.), *Social research in developing countries*. University College Press, London.
- WCED (1987). *Our common future*. Oxford University Press, Oxford.
- WCMC (1992). *Global biodiversity: status of the Earth's living resources*. Chapman and Hall, London.
- Wells, M. P. (1992). Biodiversity conservation, affluence and poverty: mismatched costs and benefits and efforts to remedy them. *AMBIO* 21(3): 237-43.
- Wells, M. P. (1993). Neglect of biological riches: the economics of nature tourism in Nepal. *Biodiv. Conserv.* 2: 445-64.
- Wells, M. P. and K. E. Brandon (1992). *People and parks: linking protected area management with local communities*. World Bank/WWF/USAID, Washington DC.
- Wells, M. P. and K. E. Brandon (1993). The principals and practice of buffer zones and local participation in biodiversity conservation. *AMBIO* 22(2-3): 157-62.

- Western, D. and M. C. Pearl, Eds. (1989). *Conservation for the 21st Century*, Oxford University Press, New York and Oxford.
- Wheeler, B. (1992). Alternative tourism - a deceptive ploy. *Progress in Tourism, Recreation and Hospitality Management* 4: 140-5.
- Wheeler, B. (1993). Sustaining the ego. *J. Sust. Tourism*. 1(2): 121-9.
- Wight, P. (1994). Environmentally responsible marketing of tourism. In E. Cater and G. Lowman, (Ed.), *Ecotourism: a sustainable option?* John Wiley & Sons, Chichester: 218.
- Wilkinson, P. F. and W. Pratiwi (1995). Gender and tourism in an Indonesian village. *Ann. Tourism Res.* 22(2): 283-299.
- Wirth, C. L. (1966). The mission called 66. *National Geographic* 130(1): 7-47.
- Wood, M. E. (1991). Formulating the Ecotourism Society's regional action plan. In J. A. Kusler, (Ed.), *Ecotourism and resource conservation, I.*, Madison, WI.
- WRI/IUCN/UNEP (1992). *Global Biodiversity Strategy: guidelines for action to save, study and use Earth's biotic wealth sustainably and equitably*. WRI/IUCN/UNEP.
- WTO (1996). *Yearbook of Tourism Statistics, Vol.1, 48 ed.* World Tourism Organisation, Madrid.
- WTTC (1992). *Travel and tourism in the world economy*. World Travel and Tourism Council, Brussels, Belgium.
- WITTERC (1993). *World travel and tourism environment review, 1993*. World Travel and Tourism Environment Research Centre, Oxford.
- Wu, C. (1982). Issues of tourism and socio-economic development. *Ann. Tourism Res.* 9: 317-30.
- WWF (1988). *Program in Wildlands and Human Needs*. World Wildlife Fund, Washington DC.
- Ziffer, K. A. (1989). *Ecotourism: the uneasy alliance*. Conservation International, Washington DC.
- Zollinger, H. (1956). Bima and Sumbawa. *J. Indian Archipelago and Eastern Asia* 1: 233-60.
- Zube, E. H. and M. L. Busch (1990). Park-people relationships: an international review. *Landscape and Urban Planning* 19: 117-31.

Appendix A : Visitor Arrivals Data for KNP and Indonesia

This is an appendix to Chapter 5. The following tables present data regarding visitor arrivals to KNP and to Indonesia as a whole. These are the data from which graphs, summary tables and analyses contained in Chapter 5 are derived.

The data consists of monthly and annual arrivals, and visitor nationality. Various seasonal indices are also presented, using calculation methods presented in Section 5.2. In addition, data on the spatial distribution of visitors on Komodo island, and mode of transport to KNP, are presented.

TableAppendix A .1 Monthly Arrivals to KNP, 1983/84 - 1995/96.

	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96
April	180	90	157	136	285	311	648	1047	1506	1386	1289	1442	2281
May	40	79	317	153	212	229	989	698	1131	1463	1237	2133	2295
June	121	86	96	78	139	427	846	1241	1234	1337	1412	1536	1935
July	107	68	144	176	349	368	991	1328	1891	1876	1887	3144	2668
August	159	194	242	308	595	646	1230	1806	2333	3209	3784	3334	4040
September	40	165	130	189	295	511	1198	1801	1424	1468	2009	2261	2835
October	32	292	194	100	307	352	671	1196	1352	1399	1641	1916	2427
November	100	95	90	111	312	500	543	1088	1219	975	2555	1822	2172
December	40	82	166	54	181	350	505	644	1007	1098	1039	2056	1337
January	48	71	230	249	180	306	625	886	1188	1307	2010	2777	2560
February	154	194	159	240	266	434	553	994	989	592	1568	1228	2503
March	119	166	212	278	298	500	893	1063	859	720	1511	2141	1938
Domestic	398	933	1133	894	1242	924	969	1158	852	668	1410	2294	2124
Foreign	742	649	1004	1178	2177	4010	8723	12634	15281	16162	20532	23496	26867
% Domestic	34.91	58.98	53.02	43.15	36.33	18.73	10.00	8.40	5.28	3.97	6.43	8.89	7.33
% Foreign	65.09	41.02	46.98	56.85	63.67	81.27	90.00	91.60	94.72	96.03	93.57	91.11	92.67
Total	1140	1582	2137	2072	3419	4934	9692	13792	16133	16830	21942	25790	28991
Growth (%)		38.77	35.08	-3.04	65.01	44.31	96.43	42.30	16.97	4.32	30.37	17.54	12.41

Table Appendix A.2 Monthly Seasonal Indices for KNP Arrivals, 1983/84 - 1995/96.

Year	April	May	June	July	August	September	October	November	December	January	February	March
1983/84	-	-	-	-	-	-	0.351	1.122	0.448	0.557	1.790	1.284
1984/85	0.828	0.662	0.711	0.550	1.537	1.270	2.169	0.645	0.520	0.440	1.166	0.994
1985/86	0.973	2.018	0.598	0.844	1.377	0.738	1.095	0.531	1.025	1.415	0.954	1.234
1986/87	0.798	0.915	0.477	1.103	1.880	1.112	0.559	0.592	0.280	1.231	1.084	1.169
1987/88	1.136	0.791	0.494	1.229	2.109	1.038	1.073	1.084	0.602	0.575	0.841	0.910
1988/89	0.920	0.658	1.177	0.981	1.668	1.269	0.828	1.062	0.673	0.543	0.707	0.750
1989/90	0.914	1.367	1.156	1.318	1.597	1.514	0.814	0.655	0.606	0.724	0.613	0.939
1990/91	1.049	0.670	1.159	1.221	1.617	1.577	1.024	0.902	0.526	0.711	0.769	0.819
1991/92	1.168	0.869	0.934	1.402	1.713	1.053	1.009	0.904	0.737	0.867	0.703	0.595
1992/93	0.957	1.016	0.933	1.301	2.243	1.042	1.000	0.704	0.796	0.946	0.421	0.495
1993/94	0.868	0.792	0.869	1.142	2.198	1.119	0.894	1.360	0.541	1.016	0.779	0.754
1994/95	0.712	1.063	0.761	1.502	1.579	1.065	0.877	0.819	0.914	1.236	0.544	0.927
1995/96	0.969	0.960	0.815	1.142	1.698	1.169	-	-	-	-	-	-

Table Appendix A .3 Quarterly Seasonal Indices and Irregulars for KNP Arrivals, 1983/84 - 1994/95.

Year	Quarterly Seasonal Indices				Quarterly Irregulars			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1983/84	1.152	0.771	1.119	0.627	-	-	-	-
1984/85	0.888	1.154	1.006	1.078	-	-	-	-
1985/86	1.195	0.735	1.353	0.884	-	-	-	-
1986/87	1.169	0.801	1.445	0.480	-	-	-	-
1987/88	0.764	0.913	1.302	0.893	-	-	-	-
1988/89	0.671	1.155	1.474	0.845	-	-	-	-
1989/90	0.756	0.970	1.478	0.692	-3	41	76	-441
1990/91	0.783	0.985	1.404	0.823	128	115	-114	-75
1991/92	0.719	0.968	1.538	0.879	-216	48	275	184
1992/93	0.611	0.847	1.484	0.831	-828	-534	137	-46
1993/94	0.861	0.836	1.384	0.929	809	-774	-269	596
1994/95	0.891	0.928	1.336	0.875	1218	-214	-538	271
Average ¹	0.756	0.956	1.443	0.839				
Adjusted Average	0.757	0.957	1.445	0.841				

¹ using most recent six years of data, to remove the effect of long-run secular changes on seasonality.

TableAppendix A .4 Annual Arrivals to KNP by Nationality, 1990/91 - 1995/96.

Nationality	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	% of Total 95/96
Germany	1906	2559	3108	3800	4067	4269	15.79
America	2642	2571	2990	3996	4467	3707	13.71
Holland	1425	2377	2681	3054	3480	3701	13.69
Britain	1715	2616	2336	2762	3345	3042	11.25
Australia	957	976	854	1067	1381	2122	7.85
Indonesia	1158	852	668	1410	2294	1981	7.33
France	850	692	805	1735	1170	1697	6.28
Switzerland	650	724	727	916	904	1101	4.07
Italy	290	391	357	311	380	810	3.00
Denmark	192	138	126	148	571	657	2.43
Canada	412	427	506	540	628	647	2.39
Japan	182	214	204	290	479	634	2.35
Austria	378	388	418	437	591	521	1.93
Sweden	415	411	334	377	487	485	1.79
New Zealand	180	232	195	260	297	387	1.43
Belgium	120	244	146	252	425	356	1.32
Norway	70	83	84	116	183	232	0.86
Other European	146	116	98	150	242	217	0.80
Asia	44	75	131	159	202	200	0.74
E.Europe, Mid.East	17	15	16	48	66	148	0.55
Latin America	43	28	36	103	67	93	0.34
Africa	2	2	10	11	34	28	0.10
Totals	13794	16131	16830	21942	25760	27035	100

Table Appendix A .5 Monthly Arrivals to KNP by Nationality, 1995/96.

	April	May	June	July	August	September	October	November	December	January	February	March
Europe	1323	1268	1175	1774	3041	2022	1753	1279	868	1359	1331	-
America	459	386	239	243	350	272	321	453	158	706	767	-
Australasia	150	319	292	321	283	321	151	171	130	202	169	-
Asia	100	53	57	83	138	56	26	68	42	111	100	-
Other	19	24	22	17	10	8	3	0	14	23	24	-

Table Appendix A .6 Monthly International Arrivals to Indonesia, 1983/84 - 1993/94.

Month	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94
Apr	48678	58501	53998	57487	73467	102650	110411	163628	192197	237124	248758
May	51074	53126	51306	58925	81025	95520	118605	171092	192807	214447	261371
Jun	49728	51534	57254	63884	87276	100376	136211	188297	232000	262561	288036
Jul	60145	68448	68287	75259	101885	127842	155561	202430	237657	274697	314254
Aug	59881	66458	71539	78762	104213	109580	138642	198553	237676	284146	338439
Sep	49883	56634	59835	61646	87194	103435	139707	185285	221631	264209	289020
Oct	54814	56355	63182	63079	88864	111619	146554	178919	230614	270477	284090
Nov	55318	58859	62517	76845	93537	116613	150956	186402	232425	262343	294535
Dec	61856	65289	80675	93584	109695	139297	177776	222621	253609	288403	325781
Jan	54377	51531	59922	83425	88056	106234	161304	169030	213331	279070	
Feb	55270	61959	67040	70492	99752	119151	151674	175163	261295	236158	
Mar	56059	67268	68602	79274	106309	126157	167361	195061	231128	243626	
Total	657083	715962	764157	862662	1121273	1358474	1754762	2236481	2736370	3117261	
Annual Growth (%)		8.96	6.73	12.89	29.98	21.15	29.17	27.45	22.35	13.92	

Table Appendix A .7 Quarterly Seasonal Indices and Irregulars for Indonesian Arrivals, 1983/84 - 1992/93.

Year	Quarterly Seasonal Indices				Quarterly Irregulars			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
1983/84	0.972	0.937	1.081	1.036	473	-439	4756	-259
1984/85	1.005	0.883	1.055	1.009	6533	-11022	388	-4989
1985/86	0.990	0.889	1.022	1.068	4181	-10899	-6189	5598
1986/87	0.969	0.938	1.076	1.045	-282	-343	5775	1651
1987/88	0.979	0.945	1.025	1.016	2820	2040	-8800	-5962
1988/89	0.955	0.929	1.027	1.056	-5429	-4150	-10598	6185
1989/90	0.966	0.986	1.063	1.037	-1882	26567	4900	-445
1990/91	0.904	0.985	1.051	1.030	-40403	30569	-1520	-4348
1991/92	0.975	0.948	1.065	1.029	3601	7396	8802	-5696
1992/93	0.931	0.950	-	1.040	-32665	9451	-	1483
Average	0.968	0.938	1.052	1.036				
Adjusted Average	0.970	0.939	1.053	1.038				

Table Appendix A .8 Monthly Use of Alternative Trails on Komodo Island, 1993/94 - 1995/96.

Month	1993/94			1994/95			1995/96		
	Gunung Ara	Jalan Hutan	Jalan Hutan	Gunung Ara	Jalan Hutan	Jalan Hutan	Gunung Ara	Jalan Hutan	Jalan Hutan
April	4.5	35	32	10	32	32	5	0	0
May	10	38	47	10	47	47	12	4	4
June	28	11	2	18	2	2	12	4	4
July	26	31	22	27	22	22	36	2	2
August	28	17	22	89	22	22	67	4	4
September	35	32	28	56	28	28	24	9	9
October	12	11	42	15	42	42	20	11	11
November	20	4	13	9	13	13	19	0	0
December	1	8	6	8	6	6	36	10	10
January	35	20	0	13	0	0	19	13	13
February	17	2	5	16	5	5	8	14	14
March	5	34	30	28	30	30	5	4	4

Table Appendix A .9 Monthly Arrivals to KNP by Mode of Transport, 1995/96.

Month	Charter Sape	Charter LB	Charter Lombok	Ferry LB	Ferry Sape	Cruise Ship	TOTAL
Apr	281	109	177	112	325	947	1951
May	326	182	182	77	259	1075	2101
June	185	166	175	30	194	676	1426
July	482	352	300	84	443	801	2462
August	448	297	319	151	560	1045	2820
September	511	256	362	25	255	811	2220
October	348	233	218	91	253	760	1903
November	143	105	186	84	296	908	1722
December	115	77	101	92	207	669	1261
January	97	55	221	84	287	1691	2435
February	158	57	53	133	249	1457	2107
March	202	79	113	134	260	887	1675
TOTAL	3296	1968	2407	1097	3588	11727	24083

TableAppendix A .10 Monthly Arrivals to Komodo Island by Individual cruise ships, 1995/96.

Month	Regular visitors (small-medium-sized ships)						Irregular visitors (medium-large ships)							
	1	2	3	4	5	6 Others ²	7	8	9	10	11	12	13	14
April	435	51	13	82	-	32	-	-	322	-	-	-	-	-
May	412	73	18	126	25	-	0	-	-	-	421	-	-	-
June	413	103	-	99	33	-	20	-	-	-	-	-	-	-
July	426	73	92	68	-	27	102	-	-	-	-	-	-	-
August	724	59	75	86	31	-	35	-	-	-	-	-	-	-
September	566	98	28	31	13	18	42	-	-	-	-	-	-	-
October	474	56	147	-	49	12	14	-	-	-	-	-	-	-
November	436	57	100	-	30	23	0	258	-	-	-	-	-	-
December	569	54	-	-	19	-	24	-	-	-	-	-	-	-
January	529	58	-	-	37	-	0	-	538	-	-	-	318	200
February	466	-	-	-	23	-	2	141	486	174	165	-	-	-
March	660	54	28	-	49	-	44	-	127	-	-	-	-	-
Total	6110	736	501	492	309	112	295	399	322	174	165	421	318	200
Number of Trips	90	41	23	23	19	8	19	4	2	2	2	1	1	1
Mean Passengers/Trip	67.89	17.95	21.78	21.39	16.26	14.00	15.53	99.75	161.00	87.00	82.50	421.00	318.00	200.00

² combined totals for 11 small boats making less than four trips each to the park during the year

Appendix B : Comments from Visitors Regarding Tourism in KNP

This is an appendix to Chapter 7. It provides some direct quotes from visitors regarding their experiences in KNP. It illustrates the variety of perceptions and attitudes of visitors with regard to facilities, service and pricing.

Quotes about rangers/ guided walks

‘The ranger walk to the main feeding place was much too crowded, too many people and only two rangers. I don’t know why we had to pay the rangers because they didn’t tell [us] anything about the dragons or give other information, and because the group was so big it was hard to get their attention.’ *Dutch student*

Quotes about accommodation

‘The accommodation is the most expensive in Indonesia so far, and I think it is way too much because there was no water, electricity and full of rats and cockroaches.’
Dutch student

‘You really should get rid of all those rats in the bungalows and the restaurant. Its disgusting. Already now Komodo is known among travellers for its rathole *losmen*, and some people don’t go there because of the rats. Rp15,000 is an expensive price for a room without breakfast, *mandi*¹, mosquito net or fan, and when you just sleep on the floor. At least make a proper bed, so you don’t have to sleep among running rats in the night! Rats are a serious problem, and you have to do something about it, if you still want tourists to come here for more than an hour.’ *Danish visitor*

Quotes about boats

‘The only thing we couldn’t understand is the behaviour of the boat driver who picked us up from the ferry. He took us to the remote beach and threatened to leave all the backpackers there if we don’t pay him immediately. Everyone on the boat was willing to pay but some people on the boat did not trust the boat driver and they would have wanted to pay at the Komodo harbour. The boat driver was extremely

¹ a traditional Indonesian ablution facility consisting of a large cistern from which water is taken with a plastic scoop.

aggressive, he threatened to throw our luggage to the sea if we don't do as he says. Actually the cost of that small boat to the ferry is far too expensive.' *Finnish student*

'A notice should be placed at both Sape and Labuan Bajo ferry ticket office and the small boat between the ferry and Komodo detailing the cost of this small boat and that a charge is levied. This will save much confusion and problems when people come over to the island.' *British scientist*

'Formalise transportation to Rinca, as those of us coming from and returning to Sape/Bima have a hard time making it to Labuan Bajo to make a trip to Rinca from there (especially as long as there is a boat [ferry?] only every other day.)'
Danish student

Generally Positive Quotes

'The camp is clean and the whole park well looked after. We were also surprised that this place is not touristy, probably because the staff here were friendly and very professional... As a National park this is among the best I've ever visited [although] in future it would be nice to see some more trails and information boards here.'
Finnish student

'A very well run and maintained National Park..... very good and interesting..... hope to stay longer next time.' *British scientist*

'I feel that Komodo National Park is a very important conservation area for the protection of the Komodo Dragons. It would be a shame to see them become even more endangered/extinct forever. I feel very lucky to have seen them in their natural environment in this national park. Thanks for the tour and helpful, well-informed guide. Its great the way the park is kept as natural as possible and you don't feel like you're coming to a big 'tourist trap', but to a nice park setting.'
Canadian gymnastics coach

'Major Problems: Food - not very good, very little choice, often not available.
Rats - in rooms and cafeteria. Rat traps would help!

Major assets: Guides - excellent and friendly. Location - very beautiful and well laid out.
Animals - habituated in camp and on trail.

The park is excellent and we enjoyed it very much.' *Canadian scientist*

Generally Negative Quotes

'All these things [complaints about accommodation, restaurant, rangers] are bad for people who plan to visit this park and ask me for my opinion and maybe will not come, because of bad stories.' *Dutch student*

'Komodo Island has great potential and is an important conservation area, but having worked in and around many national parks in Australia, I was appalled at the unprofessionalism of the staff. The rangers on the whole were unfriendly and uninformative and showed very little interest in being of help to their visitors. This should be a standard part of their job! This also seemed to be the general consensus of everybody I spoke to. They all seemed to feel that they were being taken advantage of and had very little choice or say in what they could do, how long they stayed due to ferries and outrageous boat prices). I find this very sad, as they will not recommend Komodo to others and I realise it is the tourist dollar which pays for the services provided (which unfortunately have been of very poor standard in comparison to other, cheaper places). Instead of being a highlight of many travellers journeys, it seems to have become more of a heartache, and the worried faces and conversations in the cafeteria makes that fairly obvious. I only hope that all the money spent here goes towards maintaining the park, research and studies of the area and its wildlife, as well as training programs for its currently useless staff.' *Australian park ranger.*

Appendix C : Estimating the Local Magnitude and Economic Impact of Tourism: A Worked Example for Labuan Bajo

Introduction

Multiple sources of data were used to estimate the local magnitude and economic impact of tourism. Both secondary sources and primary survey data were employed. The estimation procedures which yielded the results in Chapter 8 involved numerous comparisons and evaluations of data quality, detail which for clarity of presentation was excluded from that chapter. This appendix presents a worked example of this process for the most complicated and developed location, Labuan Bajo. It clearly illustrates the difficulty of accurately examining local tourism impacts, given that data is often unavailable or of dubious quality.

The Magnitude of Tourism

Two methods have been used for estimating the number of visitors Labuan Bajo. One uses data from hotels to estimate the number of overnight visitors, whilst the other uses data on transportation patterns to estimate the flow of visitors through each location. The relationship between these estimates will depend on the proportion of visitors who stay overnight. The following sources of data were used;

- Hotel occupancy figures
- Tourist length of stay questionnaire
- Park visitor books
- Harbour master boat books
- Merpati (the domestic air carrier) records
- Police 'A' form records

- **Hotel Occupancy Data**

Data from visitor book entries and (where not available) estimates based on data from previous years, suggests that 6080 visitors stayed in Labuan Bajo and adjacent beach resorts in 1995/96. A further 1072 stayed at Kanawa Island Resort, and an estimated 600 stayed at Pungu Island Resort, bringing the total to 7752.

These figures are considered to be a substantial underestimate of the total number of overnight visitors to Labuan Bajo, since visitor book registration is not enforced at all hotels, particularly during the busier summer months. Therefore a second estimate was made for a number of hotels (in italics in Table C.1). Based on observations made during August 1996, a daily figure was estimated for the average number of overnight visitors. This was converted into an annual figure, taking into account length of stay and adjusting for seasonal differences in visitation. With these adjustments, the total number of overnight visitors to the town and adjacent beach resorts is estimated to be 9198. This is still thought to be lower than the actual figure.

Table Appendix C .1 Estimated Total Number of Visitors and Number of Foreign Visitors to Each Hotel in Labuan Bajo, April 1995 - March 1996.

Hotel	Hotel Figures			Revised Estimate	
	Total	Foreign	% Foreign	Total	Foreign
Wisata	602	524	87.0	<i>1,362</i>	<i>1,186</i>
Mitra Tour	147	125	85.0	147	125
Chez Felix	618	618	100.0	618	618
Bajo Beach	1,450	1,257	86.7	1,450	1,257
Mutiara	438	372	84.9	<i>681</i>	<i>578</i>
Gardena	579	579	100.0	<i>1,022</i>	<i>1,022</i>
Cendana	586	293	50.0	<i>586</i>	293
New Bajo Beach	441	421	95.5	441	421
Waccicu	1,219	1,219	100.0	1,219	1,219
Kanawa Island	1,072	1,072	100.0	1,072	1,072
Pungu Island	600	600	100.0	600	600
Total	7,752	7,080	91.3	9,198	8,401

Comprehensive data from two hotels (Wisata and Bajo Beach) indicate that between 81% and 87% of overnight visitors are foreign. On the basis of these results, it is assumed that Mutiara Beach Hotel and Mitra Tour, which are also B-class hotels on the main street of the town, also receive c.85% foreign clientele. However, the managers of six other hotels and resorts indicated that almost 100% of their clientele were foreign visitors. The last, Cendana Beach

Hotel, only reported numbers of foreign clientele, and an estimated 50% of clients are domestic business and government groups (Cendana manager, *pers.comm.*). Taking these differences into account, and based on reported visitor figures, it is estimated that 91.33% of hotel guests in Labuan Bajo are foreign visitors. Using these figures, a total of 8,401 foreign visitors stayed in hotels in and around Labuan Bajo in 1995/96.

- **Transport Figures**

Transport to and from Labuan Bajo is more comprehensive than that which serves Sape. A daily air service is run by Merpati. Buses and taxis link the town with the rest of Flores to the east, via a single highway. Sea services include the ferry to KNP and Sape, charter boats to KNP and Lombok, and the national Peln ferry line, running fortnightly circular routes east to Kupang, north to Ujung Pandang, and west to Lombok, Bali and Java.

Two related estimates of visitor flows can be made. One uses transport data from Labuan Bajo to build a flow diagram of arrivals and departures. The other uses a proportion of the arrival data to the park as a surrogate measure of visitor flow through the town. The latter will be dealt with first.

- **Estimate using park arrivals figures**

Of the visitors to Komodo Island, those travelling by ferry from Labuan Bajo obviously passed through that town, and those travelling by ferry from Sape are assumed to have continued on to Labuan Bajo. Those travelling by cruise ship did not visit the town. Of the visitors to both islands of the park, those travelling by charter from Sape are assumed not to have continued on to Labuan Bajo, whilst those travelling from Labuan Bajo obviously did so. Those travelling to and from Lombok begin or end their journey in Labuan Bajo too. If it is assumed that all visitors to Labuan Bajo visited the park, and that visitors only made one visit to the park, then an estimated 12,776 foreign visitors passed through Labuan Bajo in 1995/96. However, some of those visiting Komodo by ferry will also have visited Rinca by charter, and so will have been counted twice. If an estimated 50% of Rinca charters from Labuan Bajo also visited Komodo by Ferry, then a revised estimate of 11,636 foreign visitors to Labuan Bajo is reached (Table C.2).

Table Appendix C .2 Estimate of Foreign Visitors to Labuan Bajo Based on KNP Arrivals by Different Modes of Transport.

Island	Transport type	Number of Passengers	Visitors to Labuan Bajo
Komodo	Ferry from Sape	3,588	3,588
	Ferry from Labuan Bajo	1,097	1,097
	Charter from Sape	3,296	-
	Charter from Labuan Bajo	1,968	1,968
	Charter from Lombok	2,407	2,407
	Cruise Ship	11,727	-
Rinca ¹	Charter from Sape	144	-
	Charter from Labuan Bajo	2,281	2,281
	Charter from Lombok	2,407	2,407
Total		28,915	13,738
Total Foreign ²			12,776
Adjusted total			11,636

- **Estimate using town arrivals figures**

Figures and estimates for foreign visitor arrivals and departures to and from Labuan Bajo are presented in Table C.3. Merpati figures for foreign passengers indicate 1417 arrivals and 2115 departures in 1995/96. Ferry arrivals and departures were 4174 and 1929 respectively, according to Harbour Office records. Arrivals by charter boat from Lombok numbered 2407, according to KNP records. Of charter boat departures, all but those to Lombok will have returned to Labuan Bajo, so do not constitute departures. It has been assumed that charter boat departures to Lombok were equal in number to arrivals.

¹ Estimates based on incomplete data.

² 93% of visitors - see Chapter 5.

Table Appendix C .3 Labuan Bajo Visitation Patterns, 1995/96.

	Overnights ³	Arrivals	Departures	Park Data ⁴
Hotel Data	8,401			*
Air Passengers		1417	2115	*
Ferry Passengers		4174	1929	4685
Charter Passengers		2407	2407	6,951
Bus Passengers		3226	3949	
Pelni Passengers		250	250	
TOTAL	8,401	11474	10650	11,636

There are no records of arrivals and departures by bus or taxi, so an estimate of these figures has been made. It is assumed that 50% of all arrivals from the west (by charter, ferry and air) continue east overland by bus, and similarly that 50% of departures to the west (by charter, ferry and air) have come overland from further east. Thus an estimated 3226 arrivals and 3949 departures can be attributed to bus and taxi transport.

Records for arrivals and departures by the Pelni Line ferries do not differentiate between foreign tourists and locals, so accurate data is not available. Based on observations made during visits to the area in 1995 and 1996, it is estimated that approximately 5 tourists/week on average, or 250/year, arrive at and depart from Labuan Bajo by Pelni ship.

In addition to these data, there are figures from the police 'A forms' which every overnight visitor is supposed to complete upon registration at their hotel. This form includes a question about their means of transport to Labuan Bajo. The police records suggest that, of 4312 visitors to Labuan Bajo, 1506 travelled by air, 982 by sea and 1824 by bus. However, this is an underestimate of the total number of visitors, since not all visitors fill in a registration form. Furthermore, it cannot be considered a random sample of the visitor population, so that relative frequencies of land, sea and air arrivals cannot be taken as representative of the population as a whole. Therefore this data has been discarded.

³ See Table C.1.

⁴ See Table C.2.

These figures suggest that between 10500 and 11500 visitors passed through Labuan Bajo in 1995/96. This is in close agreement with the figures from the park visitor arrivals books. However, the estimate for the number of overnight visitors is only approximately 8,400. This suggests that either 30% of visitors do not stay overnight, or the estimate for overnight visitors is too low. Since all arrivals except by air are in the evening, and all departures except by air are in the morning, it is unlikely that so many visitors passed through the town without staying overnight. Therefore it is assumed that the estimate of overnight visitors based on hotel data is low, and that based on transport patterns is accepted as the more accurate of the two.

Visitor Length of Stay

Two estimates for length of stay in Labuan Bajo have been made. One uses hotel data, the other uses data from the visitor questionnaire administered in Labuan. Data from five hotels in Labuan Bajo suggest that visitors spend on average 1.76 nights in the town. Visitors themselves estimate that they spend 3.01 days ($n=180$, $s.d.=1.36$) and 2.92 nights in Labuan Bajo ($n=199$, $s.d.=1.31$). The difference is probably due to the fact that some visitors stay at more than one hotel, notably those that visit the island resorts of Kanawa and Pungu, and some visitors return after a night away visiting the park and may be counted as two separate individuals by hotels. Therefore, the tourist estimate is taken as a more reliable figure.

The Economic Impact of Tourism in Labuan Bajo

Supply-Side Estimates of Revenue Patterns

A questionnaire survey of local businesses was carried out in Labuan Bajo during August 1996. This was designed to collect information on the magnitude of revenue flow to different sectors of the local economy, as well as information regarding employment. All hotels and restaurants were surveyed, together with a sample of local shops and charter boats. The following sections deal with each sector in turn, with a subsequent summary compiling all the data.

- **Hotels**

Visitors to Labuan Bajo estimated the average cost of accommodation per person per night to be US\$4.52. Using the total estimated bed nights of 33,000, an estimated US\$149,000 was spent on accommodation in and around Labuan Bajo in 1995/96.

TableAppendix C .4 Estimate of the Total Annual Revenue to Hotels in and Around Labuan Bajo From Foreign Tourists.

Hotel	Reported Bed Rates (US\$)		Revenue Based on Reported Visitation ⁵ (US\$)		
	minimum	maximum	Minimum	Maximum	Average
Wisata	1.73	6.50	2,360	8,852	5,606
Mitra Tour	1.73	3.47	255	510	382
Chez Felix	1.73	4.33	1,071	2,678	1,874
Bajo Beach	1.73	6.50	2,513	9,424	5,968
Mutiara	1.73	3.47	1,180	2,360	1,770
Gardena	1.73	3.47	1,771	3,542	2,657
Cendana	2.71	6.50	1,587	3,808	2,698
New Bajo Beach	5.42	13.00	2,388	5,732	4,060
Waccicu	5.42	6.50	6,602	7,922	7,262
Kanawa Island	3.79	5.42	4,064	5,806	4,935
Pungu Island	3.25	5.20	1,950	3,120	2,535
Total			25,742	53,754	39,748
Average cost/bed			2.80	5.84	4.32
Adjusted Total⁶			92,355	192,856	142,606

Using the reported maximum and minimum room rates, as of April 1996, and reported visitor numbers to each hotel, and adjusting for the difference between reported visitation and estimated total bed nights, a second estimate of total revenue to hotels can be reached (Table C.4). These results suggest an average bed night cost of US\$4.32, and a total annual revenue

⁵ see Table C.1.

⁶ taking into account the difference between reported bed nights and the total estimate of 33,000 bed nights.

to hotels of US\$143,000. These estimates are very close to the tourist estimates of accommodation expenditure.

- **Restaurants**

Questionnaires were administered to 25 restaurants in Labuan Bajo. Respondents were asked to estimate the number of tourists and non-tourists that visited the restaurant the day before, and the income received. They were also asked to estimate the average, maximum and minimum number of tourists and non-tourists visiting the restaurant per day, along with the average monthly income. This approach provided three estimates of the number of tourists visiting each establishment, the revenue from tourists and the proportion of total revenue attributable to tourism. This data is presented in Table C.5.

Table Appendix C .5 Estimates of the Total Annual Revenue to Restaurants in Labuan Bajo From Foreign Tourists.

Estimate	Annual Number of Tourist Meals	% of Total Customers	Income from Tourists (US\$)	% of Total Income	Average Cost per Meal (US\$)	Average Spend per Tourist (US\$)	Average Number of Meals per Day
Estimate (a)	63,510	48.7	168,320	66.17	2.65	5.10	1.92
Estimate (b)	137,605	48.4	94,864	57.8	0.69	2.87	4.17
Estimate (c)	74,735	46.3	91,618	55.8	1.21	2.78	2.29
Overall Average	91950	47.8	118,267	59.9	1.52	3.58	2.79

Tourists estimate that they spend approximately US\$145,000 on meals. In addition, approximately US\$126,000 is spent on drinks, of which an estimated 50% is spent in restaurants. Thus the total tourist estimate of restaurant spending is approximately US\$ 208,000. The results of the restaurant survey in Table C.5 suggest that each visitor spend approximately US\$3.58 per day on meals, with a total expenditure of approximately US\$118,000. This is lower than the tourist estimate. However, it does not include restaurant expenditure at Waecicu Beach or the island resorts of Pungu and Kanawa. If visitors so these resorts spend 2 nights there, out of the three they spend in and around Labuan Bajo, then an estimated 6,900 bed nights are spent there. This is approximately 20% of the total. Adjusting

the total revenue figure by this factor gives a total annual estimate of restaurant revenue of approximately US\$148,000. This is still lower, than the tourist estimate, and is probably due to under-reporting of revenues by restaurateurs.

- **Shops**

25 shops on the main street of Labuan Bajo were surveyed. The majority (n=18) of the shops surveyed in Labuan Bajo were general stores selling a variety of goods and supplies. However, a small proportion comprised clothing shops (n=3), souvenir shops (n=3) and an electrical goods shop. Questions were similar to those asked of restaurateurs.

The mean expenditure per tourist in shops in Labuan Bajo was US\$7.78, but with some variation across the types of shop. Mean expenditure in souvenir shops was twice the overall mean, and 2.5 times greater than mean expenditure in general stores and clothes shops. However, the sample sizes are too small to adequately test the significance of this result (Table C.6).

Table Appendix C .6 Statistics for Expenditure per Tourist in Shops in Labuan Bajo.

Location	Mean Expenditure (US\$)	s.d. (US\$)	95% C.I. (US\$)	n
Clothes Shops	6.50	*	*	2
General Stores	6.58	7.70	3.66	17
Souvenir Shops	16.61	8.76	9.91	3
Electrical Shop	4.33	*	*	1
Total	7.78	7.90	3.23	23

Respondents were asked about the number of tourists and non-tourists visiting their shops each day. On average, 36% of shop clientele are tourists, and an average of around 12 tourists per day visit shops in Labuan Bajo. For souvenir shops, 75% of customers are foreign tourists, and the number visiting each day is 24, double the average. These responses may be high, since the survey was carried out in the high season for foreign tourism, and shopkeepers' perceptions may have been skewed by the above average visitation levels at the time of the survey.

It is difficult to make an estimate of total tourist spending in shops in Labuan Bajo. There are around 40 shops in the town. If the estimates of visitation and expenditure from the business survey are used, a total estimate of over US\$1 million is reached, which is clearly too high. The tourist estimate of spending on souvenirs and drinks in local shops is US\$152,000. Additional spending on snacks and other consumables (estimated to be 75% of the total spent on drinks, i.e. US\$47,000) takes the total to approximately US\$200,000.

- Charter Boats

Table Appendix C.7 Common Routes and Prices for Charter Trips from Labuan Bajo.

Destination	Duration	Mean number of passengers per trip	Mean Price per passenger (Rp)
Bidadari	0.5-1 day	2.0-7.5*	30,000 per group*
Sabolo/Kanawa	1 day	2.0-7.5*	38,330 per group*
Rinca	1 day	2.8-7.8*	70,830 per group*
Komodo	1 day	2.8-7.8*	111,670 per group*
Rinca + Komodo	2 days, 1 night	5-8	50,000
Lombok (1-way)	3 days/2 nights	8-15	150,000
Lombok (1-way)	6 days/5 nights	8-15	200,000

*n=6 for these estimates. Prices for the overnight trips are more or less standardised. Party size estimates for these longer trips are based on observation and reported figures from one operator.

Charter boat captains were not surveyed to estimate the total revenue to this sector from tourism (Chapter 8). However, park figures and other estimates of magnitude have been used with the price figures in Table C.7 to generate an alternative estimate of charter boat revenue. The total annual figure is estimated to be approximately US\$440,000, which is slightly higher than the tourist estimate of US\$373,000.

- **Buses, Taxis and Ferries**

Bus and taxi drivers were not surveyed to estimate total revenue to this sector, partly because of logistical problems, and partly because much of this revenue does not accrue to the local economy. However, an estimate can be made using estimates of the number of bus and taxi passengers (see Table C.3). If each arrival and departure is assumed to have spent Rp10,000 (a reasonable estimate based upon prices of different trips), then an estimated total of US\$31,100 is spent on public buses. This is close to the tourist estimate of US\$27,700.

Similarly, ferries were not surveyed. However, foreign passenger numbers are available for the government ferry between Sape and Labuan Bajo, and an estimate has been made for Pelni passengers. Using these, and advertised ticket prices, it is estimated that US\$40,000 is spent by tourists on ferries to and from Labuan Bajo. This is less than half of the tourist estimate of US\$87,000.

Comparison with Tourist Estimates

Estimates of revenue based on information provided by local businesses was compared with estimates of spending by tourists (from Table 8.5). The two are remarkably similar (Table C.8). This level of agreement suggests that both estimates are reasonably accurate. Therefore, a simple average of the two has been used in the analysis presented in Chapter 8.

Table Appendix C .8 Summary of Estimates of Tourist Spending in Labuan Bajo.

	Total Expenditure (US\$)			% of Total		
	Local	Tourist	Average	Local	Tourist	Average
Hotel	143,000	149,000	146,000	14.3	14.3	14.3
Restaurant	148,000	208,000	178,000	14.8	19.9	17.4
Shops	200,000	200,000	200,000	20.0	19.2	19.6
Charter Boats	440,000	373,000	406,500	43.9	35.8	39.8
Buses etc.	31,000	28,000	29,500	3.1	2.7	2.9
Ferry	40,000	85,000	62,500	4.0	8.1	6.1
Total	1,002,000	1,043,000	1,022,500			