

**INSTITUTE OF APPLIED SCIENCES
THE UNIVERSITY OF THE SOUTH PACIFIC**

***WORKSHOP REPORT*
TOURISM CARRYING CAPACITY
ASSESSMENT & SUSTAINABLE
TOURISM IN FIJI**

IAS ENVIRONMENT REPORT NO. 184

by

Batiri Thaman Hughes

December, 2006

WORKSHOP REPORT

**TOURISM CARRYING CAPACITY ASESMENT &
SUSTAINABLE TOURISM IN FIJI**

**December 1, 2006
PRIDE Conference Room, USP**



**INSTITUTE OF APPLIED SCIENCES, USP &
MINISTRY OF TOURISM
December 2006**

Introduction & Background

The Workshop on Tourism Carrying Capacity & Sustainable Tourism in Fiji was held on Friday December 1st, 2006 at the PRIDE Conference Room, University of the South Pacific. Eleven participants attended the workshop and were mainly from government departments and other non-government organisations such as the Fiji Visitors Bureau (Refer to Appendix A for Participants List). Around 20 were confirmed to attend but due to the political crisis on the day of the workshop many were not able to attend.

The workshop was organised by the Institute of Applied Sciences with assistance from the Ministry of Tourism. The idea to hold the workshop arose from discussions held during meetings of the National Integrated Coastal Management Committee, which is comprised of government and non-government organisations. During these discussions it was acknowledged that some tourism areas in Fiji had exceeded or were near their carrying capacity i.e tourism was leading to negative environmental and social impacts, and that an assessment of these areas would assist in future planning for tourism development and provide information for more sustainable tourism. An assessment of carrying capacity would also be useful for areas that are still in the process of developing tourism to determine appropriate types and amounts of development. During a presentation to the committee by the Ministry of Tourism on the Review of their Development Plan, it was suggested that the concept be incorporated into future tourism planning for identified tourism areas. The usefulness of this type of assessment and information gathering was acknowledged and IAS was identified to gather more information on Tourism Carrying Capacity Assessment and hold a workshop to further discuss the concept.

Objectives

The following were the workshop objectives:

1. Understand and discuss the concept of Tourism Carrying Capacity Assessment (TCAA), indicators used and application to sustainable tourism development
2. Review examples of TCCA undertaken in other countries
3. Explore its use as a strategy for improving tourism development planning in Fiji including:
 - Identifying suitable suite of parameters
 - Process of undertaking a TCAA
 - Priority Areas to undertake assessment
 - Incorporation into tourism planning and approval of development proposals

Summary of Presentations & Discussion

Although a more formal program was to be followed for the workshop (Refer to Appendix B) due to the small number of participants, presentations and discussions were largely informal and the workshop finished at 1 pm.

1. Presentation by Ministry of Tourism – Manoa Malani

Manoa made a presentation on the tourism industry in Fiji including

- What the current capacity is in terms of rooms, operators and tourist attractions
- Future scenarios for growth and which scenario would actually be within the carrying capacity of the environment
- Areas for future growth such as Savusavu, Labasa and Taveuni
- Regional strategies for tourism planning
- Studies which indicate environmental and social impacts of tourism in some of the key tourism locations

(see Appendix C for powerpoint presentations)

A discussion followed.

Paulo questioned what the Ministry of Tourism policy and vision was for tourism development in Fiji. Manoa replied that the economic issue was the main focus with social and environmental concerns only addressed if it affects the economic benefits.

Jo from FVB mentioned that in the Yasawas there was a need for improvement of water infrastructure and that this was the limiting factor to tourism in the area.

Bill made a comment that carrying capacity assessment should be a part of broader coastal management planning. He also stated that within the growth rates proposed there should be an indication of how many would be big resorts and how many would be backpackers as well as the spatial layout of the growth.

There was also discussion on the tourism operations in the Yasawas and how there was little regulation of the development of the backpackers. It was mentioned that solid waste disposal was a major issue for the backpacker resorts. Bill said that arrangements should be sought perhaps with cruise operators to assist with transportation with waste back to the mainland for disposal. Manoa also mentioned that many of the backpackers accommodation had been sold to foreigners and thus there is now no return for the indigenous landowners and the ecotourism grants originally given by the Ministry of Tourism.

2. Tourism Carrying Capacity Presentation – Batiri Hughes

Batiri then made a presentation on the concept of carrying capacity including:

- Definition of Tourism Carrying Capacity
- Components of TCC
- Parameters or Types of Information required for assessment
- Use of indicators and criteria in selecting indicators
- Summary of the important physical-ecological-infrastructure, socio-demographic, and political-economic issues and indicators used to determine carrying capacity
- Process of assessing TCC

The presentation (see Appendix C) was based on a paper prepared prior to the committee which is also attached (Appendix D).

3. Case studies of TCCA – Bill Aalbersberg

Bill presented on two case studies to show examples of how tourism carrying capacity assessment was carried out in Egypt and how indicators were used to assess sustainability of tourism in Samoa. The presentation went through the steps in the process of TCAA such as data collection, information analysis, preparation and selection of tourism development options, and formulation of carrying capacity statements. He also briefly reviewed the lessons learnt in undertaking TCCA in the Mediterranean region.

(see Appendix C for presentation)

4. Use of TCAA & Indicators in Sustainable Tourism in Fiji

Unfortunately Guy Chester was not able to attend the workshop. However, it was put forward that agreement needed to be obtained from the Ministry of Tourism, and the consultants undertaking the new tourism development plan, on the incorporation of the TCC concept and information obtained from development and monitoring of indicators prior to the stakeholders continuing with choosing indicators and undertaking assessment of areas. Consultation with Department of Town & Country Planning will also need to happen as they are the main department responsible for giving development approvals in tourism areas.

5. Review and Selection of Appropriate Sustainable Tourism Indicators for Fiji

Bill then reviewed the three sets of issues and indicators as presented in the background paper, asking those present if they agreed that they should be used for Fiji and if any should be changed or added. The final list is included below:

Physical-ecological-infrastructurel

<i>Issue</i>	<i>Indicator(s)</i>	<i>Source of Data</i>
Existing facilities	Number of accommodation providers Number of beds Number of tourism service providers (tour companies, dive companies etc..)	Ministry of Tourism & Transport
Water availability and conservation	Water use (overall and per tourist/day) Number of water shortages % or number of business which practice water conservation (reuse, reduce)	Water use utility, individual establishments
Drinking water quality	% tourism establishments with water treated to potable standards % local pop with access to treated water Frequency of visitors report water-borne illnesses	Individual establishments. Local health authorities
Sewage treatment	% of sewage in area receiving treatment (primary, secondary) and calculate separately for tourism % tourist establishments with adequate treatment	Health authorities Local authorities
Solid waste	Waste volume produced per month for area Methods of solid waste disposal Number tourism establishments involved in recycling % area covered by collection services Amount of litter in public areas	Surveys of properties Surveys of establishments and recyclers Local authorities Debris counts in public areas
Tourism Transportation	Modes of transport available/used by tourists to reach destination Frequency of use of different modes	Public authorities, tourism operators
Coastal Water quality	Level of contamination (faecal coliforms, nutrients, turbidity) Frequency of algae blooms	Health or environmental authorities
Protecting Critical Ecosystems	Number of protected/conservation areas or area Health of key indicator species/populations % reef in degraded condition (biol surveys)	Local authorities or conservation organisations Environmental agencies, universities
Tourism contribution to conservation	% businesses contributing to conservation	Conservation organisations, local authorities
Environmental management systems	% companies with a policy on environmental issues or number with staff designated for environment issues Staff trained on environment/sustainability issues	Individual establishments

Socio- demographic

<i>Issue</i>	<i>Indicator(s)</i>	<i>Source of Data</i>
Local Population	Total numbers, % change Density Level immigration (Local)	Census Data
Tourist Population	Total Tourist Numbers per month Seasonality (peak tourist season)	International Visitor Survey (IVS)
Tourist Density	Number per square kilometer Number of visitors to reef areas	IVS
Local satisfaction with tourism	Level of local satisfaction with tourism	Questionnaire or interviews with local residents in tourist areas
Community benefits associated with tourism	% indicate tourism improved social services and infrastructure	Questionnaire
Fundraising efforts by non local tourism operators (ie Korolevu Health Centre)	Number of community development programs in place from tourism (health, education, etc)	Tourism businesses
Impact on community life/ Changes to lifestyle/traditions	Ratio of tourists to locals (average and peak) % changed to more western culture of dress, diet etc. % inform tourists about local protocol Number of conflicts within local communities related to tourism Commercialization of tourism (number of activities?)	Surveys, stats Interviews
Tourist satisfaction	Level of satisfaction on exit (for number issues) % of return visitors	IVS
Tourist health and safety	Number reported illnesses of tourists Number facilities that received training in food hygiene Number incidents of crime on tourists	Statistics (health, police)
Social responsibility	% business with policies aimed at social issues with local communities (e.g employment, support for development etc)	Survey
Fairness/equity of economic benefits from tourism	Perception from community	Survey

Political- economic

Tourist Expenditure/ Revenue	Spending per tourist Occupancy rates Average length of Stay	Ministry of Tourism
Economic dependence	Contribution to GNP/GDP	Bureau of Statistics
Employment	Total number locals employed (men & women) % employed in tourism (direct,indirect) % jobs full time or permanent	Surveys, Census data
Tourism seasonality	Tourism arrivals by month Occupancy rate by month (by region)	Tourism statistics
Investment	Number of tourism businesses/operators in area % locally owned	Survey
Revenue	Number informal activities benefiting from tourism (e.g handicrafts, sale of ag products, tours etc) Total tourism revenues for area (growth rate) or annual profit from tourism businesses	Survey
Marketing	Volume of marketing collateral products by type (ie TV and print advertising)	Records of tourism authority
Existence Local/Regional Planning & Development Control	Existence of land use/development/tourism planning process % facilities have had impact assessments conducted % regularly inspected by local authorities	Planning authorities
Security of land/marine areas for tourism use	Number of disputes Payment of goodwill	Survey
Land tenureship	% tourism land under native lease	NLTB
Political situation	Local political situation	Survey

Next Steps

- It was agreed that the concept and process of assessing tourism carrying capacity for various tourism areas around Fiji was important to tourism development planning in Fiji.
- Manoa agreed to check with the consultants who are also in the process of drawing up regional plans for Vanua Levu, Yasawas, Nadi Corridor and Ra whether any information being collected could be used in determining carrying capacity for these areas and whether this concept could be incorporated into their planning. Also inclusion of assessment of areas in 2008 budget.
- Bill suggested that someone be identified to continue this work, either a volunteer at Ministry of Tourism or a postgraduate student in Tourism at USP. This would include research to identify acceptable ranges for the different indicators. Bill would check with Marika whether he is interested in pursuing the topic for a Masters.
- Paulo would go through his Yasawa study to determine what information he had collected that would address some of the indicators for TCAA in Yasawas. Batiri would do the same for the Coral Coast area.
- Savusavu was agreed to be a priority area to undertake further assessment.
- Finally a second meeting on TCCA would be held sometime next year where more stakeholders would be involved.

Appendix A. List of Participants

Name	Organization	Phone
1. Jonetani Tagivetaua	Min of Tourism	3312788
2. Manoa Malani	Min of Tourism	3312788
3. Paulo Vanualailai	USP	3232538
4. Jo Tuamoto	Fiji Visitors Bureau	Jtuamoto@fijifvb.gov.fj
5. Lilieta Gavidi	FAB	LilietaG@cooltoad.com
6. Rupeni Oli	Min of Finance & National Planning	Rupeni.oli@govnet.gov.fj
7. Milika Ratu	National Trust of Fiji	Milikaratu@yahoo.com
8. Vilisi Tokalauvere	MRD	Vtokalauvere@mrd.gov.fj
9. Vilimaina Civavonovono	Agriculture - LRPD	Vcivavonovono@govnet.gov.fj
10. Bill Aalbersberg	IAS, USP	
11. Batiri Hughes	IAS, USP	

Appendix B. Workshop Programme

- 8:45** Welcome
- 9:00** **Introduction & Background** – Director Min Tourism (Banuve Kaumaitotoya)
- 9:30 Tourism Carrying Capacity Presentation & Discussion
- 10:00** **Examples of TCAA**
- 10:30 MORNING TEA
- 11:00** **Use of TCAA & Indicators for Sustainable Tourism in Fiji** - Min of Tourism
- 11:45** **Selection of Appropriate Sustainable Tourism Indicators for Fiji** – Batiri
Groupwork (2 or 3 groups) to select indicators and discuss what agency may set desired levels
- 1:00 LUNCH
- 2:00** Continue groupwork.
- 2:30** **Presentations back to Workshop & Discussion**
- 3:15** **Overall Discussion on Process of Undertaking TCAA in Fiji & Priority Areas to Test TCAA**
- 3:30** **Final Discussion on Funding/Organisations to undertake TCAA**
- 4:00** Workshop ends

Appendix C. Presentations

FIJI TOURISM INDUSTRY
CARRYING CAPACITY
ASSESSMENT WORKSHOP.
MINISTRY OF TOURISM
INTRODUCTORY STATEMENT.

MANDIA MELEN
JENUE LSE
DATE DEC 1 2008

TAKING STOCK

- 2006
- 347 ACCOMMODATION @9.070 ROOMS
- 8 CRUISE SHIPS @ 233 ROOMS
- 17 CRUISE SHIPS
- 42 TOUR OPERATORS
- 14 GOLF COURSES
- 40 NATURAL AND CULTURAL ATTRACTIONS

FUTURE SCENARIOS

MANAGED GROWTH SCENARIO

TARGET- 2014 @ 1.1 MILLION VISITOR ARRIVALS WORTH \$1.2 BILLION (65% OF 16.000 ROOMS)

LOW GROWTH (MODEST) SCENARIO

TARGET - 2014 @ 750.000 FOR 2014 BASED ON LAST 20 YEARS

AGGRESSIVE GROWTH SCENARIO

TARGET @ 1.35 MILLION VISITOR ARRIVALS (85% OF 16.000 ROOMS)

FORECAST

ACCOMMODATION

- 2011-ADDITIONAL 6.887 ROOMS IN 83 ACCOMMODATIONS
- 2014- 16.000 ROOMS IN 430 ACCOMMODATION

IN THE NEXT 7 YEARS SAVUSAVU, LABASA AND TAVEUNI WILL HAVE THE SAME DEVELOPMENT RATE AS THE MAMANUCAS.

FORECAST

- AIRLINE CAPACITY-2011 INTRO OF B787 DREAMLINER @ 320 SEATS FLYING 8.500 NAUTICAL MILES NON STOP
- INCREASE IN FUTURE POPULATION
- 2005@ 846.085.
- IN 2014?

FORECAST

- INCREASE IN # OF CARS ON THE ROAD
- INCREASE IN # ROAD CONSTRUCTION AND UPGRADES
- INCREASE IN # GOLF COURSES
- INCREASE IN FOOD SUPPLY ACTIVITIES FROM LAND AND SEA AND WATER RESOURCES.
- ETC.

CARRYING CAPACITY INDICATORS

CC INDICATOR= WHAT SCENARIO?

- CC INDICATOR?=THE MANAGED GROWTH OF 1.1 MILLION IN 2014
- CC INDICATOR?=SLOW GROWTH OF 750.000 IN 2014
- CC INDICATOR?=AGGRESSIVE GROWTH OF 1.35 MILLION IN 2014

THE GENERAL PARAMETERS

TOURISM CARRYING CAPACITY ASSESSMENT IN RELATION TO

- PHYSICAL/ECOLOGICAL
- SOCIO/DEMOGRAPHIC
- POLITICAL/ECONOMIC

REGIONAL STRATEGIES

- THE SELECTION OF TCCA INDICATORS WILL DEPEND ON
 - THE PLACE, TYPE OF TOURISM AND ENVIRONMENT TOURISM INTERFACE.
 - PRORITY AREAS
 - PROCESS

CARRYING CAPACITY- IS IT A MOVING GOAL POST?

IN 2014- WHAT WILL BE THE TOURISM INDUSTRY DIRECTION AND CONSEQUENT CC INDICATORS?

DEPENDS ON THE AREA AND NATURE OF TOURISM DEVELOPMENT

REFERENCES

- GOOD REFERENCE FROM PAST FINDINGS.
- SEA REVIEW OF 1997-2005 PLAN
 - YASAWA IMPACT STUDY
 - CCC STUDY IN MAMANUCA
 - IMPROVEMENT IN WASTEWATER MANAGEMENT IN FIJI'S TOURISM INDUSTRY.
 - ETC.

VINAKA VAKALEVU.

TOURISM CARRYING CAPACITY ASSESSMENT



Batiri Hughes & Sally Patterson
Institute of Applied Sciences, USP

Presentation

- Definition
- Components/Types of Capacity
- Indicators
- Steps in Assessing TCC

Definition

- **Tourism Carrying Capacity:** *The maximum number of people that may visit a tourist destination at the same time without causing destruction to the physical, economic and socio-cultural environment and an unacceptable decrease in the quality of visitor satisfaction.* World Tourism Org. (WTO)
- Varies from identifying maximum number users and limiting type of development (*How many people?*) e.g

TO

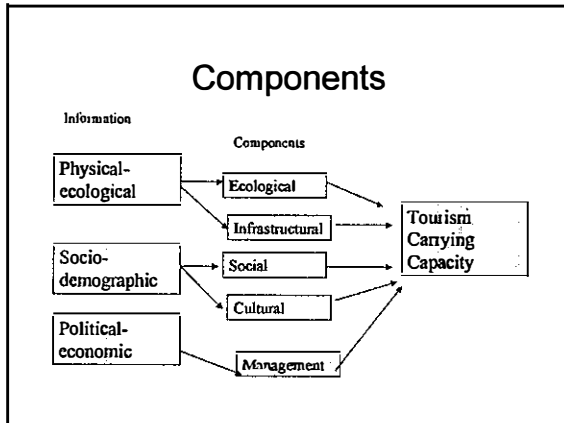
- Use as flexible management tool to guide tourism development in an area. Also to establish thresholds beyond which negative impacts may occur (*What social and biophysical conditions are desired at a destination?*)

Components of Tourism Carrying Capacity (TCC)

- **Ecological capacity** – where biological and physical factors provide constraints to tourism development. Fixed component.
- **Cultural capacity** – where impact on local community or availability of human resources is limiting factor.
- **Social capacity** – where origin/background of tourists determines level of tourism considered acceptable. Perception of local community and tourists are determinants.
- **Infrastructural capacity** – where current infrastructure systems are short term limiters to development. Flexible component.
- **Management capacity** – where key constraints are institutional (WTO 2004)

Parameters/Information to Determine Types of Capacity

1. **Physical-ecological:** Natural environment (e.g water resources, flora etc.) which are fixed & infrastructure systems which are flexible
2. **Socio-demographic:** local communities, tourist populations and interrelationships e.g population, health services, tourist experience.
3. **Political-economic:** impacts of tourism on local economy e.g no. employed and distribution, investment



- ### Indicators
- Used to provide critical information to determine tourism carrying capacity
 - Set of measurable criteria used to assess the acceptable level of change (social, environmental and physical) of a destination.
 - Also used measure changes important to tourism management e.g change in tourism structures, external factors, & impacts
 - Set tailored to an area
 - Around 10 to 25 often chosen
 - An agreed threshold/benchmark needs to be set for each indicator

- ### Criteria for selection of indicators
- Relevance to key issues of defined destination
 - Practicality of generation and use
 - Accessibility of data/information
 - Credibility
 - Clarity
 - Comparability over time and space

1. Physical-ecological-infrastructural

Issue	Indicator(s)	Source of Data
Existing facilities	Number of accommodation providers Number of beds Number of tourism service providers (tour companies, drive companies etc.)	Ministry of Tourism & Transport
Water availability and conservation	Water use (overall and per tourist/day) Number of water shuttles % of number business practice water conservation	Water use utility, individual establishments
Sewage treatment	% of sewage in area receiving treatment (primary, secondary) and calculate separately for tourism % tourist establishments with adequate treatment	Health authorities Local authorities
Solid waste	Waste volume produced per month for area Number tourist establishments involved in recycling % area covered by collection services Amount of litter in public areas	Surveys of properties and recyclers Local authorities Debris counts in public areas
Tourism Transportation	Modes of transport available/used by tourists to reach destination Frequency of use of different modes	Public authorities, tourism operators
Coastal Water quality	Level of contamination Frequency of algae blooms	Health or environmental authorities
Protecting Ecosystems	Critical Number of protected/conservation areas or areas Health of key indicator species/populations % reef in degraded condition (biol surveys)	Local authorities or conservation organisations Environmental agencies, universities

2. Socio-demographic

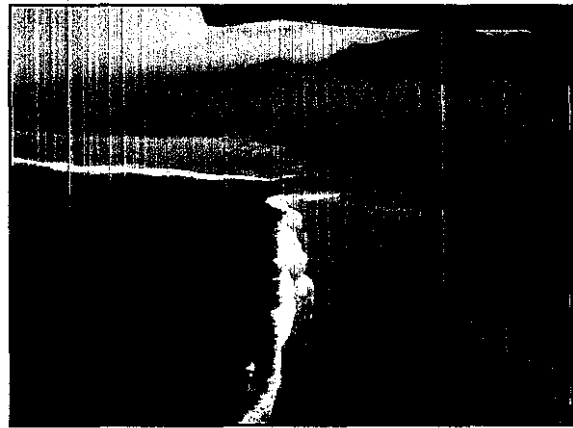
Issue	Indicator(s)	Source of Data
Local Population	Total numbers Density	
Tourist Population	Total Tourist Numbers per month	International Survey (IVRS) Visitor
Tourist Density	Number per square kilometer Number of visitors to reef areas	
Local satisfaction with tourism	Level of local satisfaction with tourism	Questionnaire or interviews with local residents
Community benefits associated with tourism	% indicate tourism improved social services and infrastructure number of community development programs in place from tourism (health, education etc.)	Questionnaire Tourism businesses
Impact on community life/Changes to lifestyle	Ratio of tourists to locals (average and peak) % changed to more western culture of dress, diet etc. % inform tourists about local protocol number of contacts within local communities related to tourism	Surveys, state interviews
Tourist satisfaction	Level of satisfaction on exit (for number issues) % of return visitors	IVS
Tourist health and safety	Number reported illnesses of tourists Number facilities that received training in food hygiene Number incidents of crime on tourists	Statistics (health, police)

3. Political-economic

Issue	Indicator(s)	Source of Data
Tourist Expenditure/ Revenue	Spending per tourist Occupancy rates Average length of Stay	Ministry of Tourism
Employment	Total number locals employed (men & women) % employed in tourism % jobs full time or permanent	Surveys, Census data
Tourism seasonality	Tourism arrivals by month Occupancy rate by month	Tourism statistics
Investment	Number of tourism businesses/operators in area % locally owned	
Revenue	Number informal activities benefiting from tourism (e.g handicrafts, sale of ag products) Total tourism revenues for area (growth rate) or annual profit from tourism businesses	
Marketing	Volume of marketing collateral products by type (te TV and print advertising)	Records of tourism authority
Existence Local/Regional Planning & Development Control	Existence of land use development/tourism planning process % facilities have had impact assessments conducted % regularly inspected by local authorities	Planning authorities

Steps in Assessing TCAA

1. Identification of key issues of area and information required
2. Identification of key indicators
3. Collection of data (surveys, existing info etc)
4. Analysis and synthesis of data (assessment of implications on different levels of tourism and types of use)
5. Preparation of tourism development options and selection of most appropriate.
6. TCC formulation phase: capacity defined by component which most limiting
6. Application and monitoring



Adapting TCCA to Fiji

- Fiji has three levels of tourism destination ie emerging, developing and mature, we can use these levels to set precedents for future developments
- Consultation from the community level up to Government Departments
- Major emphasis on environmental sector given most tourism is located within natural areas
- Able to utilise data from project partners and existing local sources ie USP to save time and cost

Case Studies of TCAA

Fuka-Matrouh EGYPT (classic TCAA)
SAMOA (indicators used to assess tourism)

Fuka-Matrouh (EGYPT)

- 70 km long coastal area in Egypt
- Initial phase of tourism development
- TCAA included in integrated planning of coastal area

1. Data Collection

- Mainly physical parameters collected
 - statistics
 - plans and reports
 - observations
 - discussions with relevant authorities
 - visits to area
 - questionnaire for local population

2. Analysis of information

- Three main types analysed (physical-ecological-infrastructure, socio-demographic, socio-political)
- Main features: natural and cultural attractions
- Main issues: availability of good roads, lack of tourist services, seasonality of tourism, lack of human capacity, large area of coast already occupied by large resorts, positive reaction to tourism

3. Preparation & Selection of Tourism Development Options

- Options for development included:
 - Without restrictions and control (continuation of existing trends)
 - Free transfer to commercial interests for overall development predominantly by foreigners
 - Alternative tourism- ecotourism – strict protection
 - Sustainable tourism development
- Sustainable tourism development scenario chosen. Largely political decision. Structure of tourism development & support services is not most desirable one but what is realistic.

4. CC Formulation

- Three main parameters described to indicate capacity levels of area
 - Physical-ecological parameters: beach capacity (125000 to 220000) and accommodation capacity (95,000 to 165,000 visitors) related to transport and communication networks and water supply, sewage and waste disposal systems
 - Socio-cultural parameters: ratio of local population to visitors may not exceed ratio 2.5 to 1.
 - Political-economic: assess tourism policies (integrated planning)

SAMOA

- Shows how process of developing indicators can assist in destination planning and development
- Whole country, tourism already developed
- Formed an interdisciplinary group to guide indicator development and monitor project

1. Data Collection

- Data collected
 - secondary sources
 - key informant interviews
 - village surveys

2. Analysis of information & development of indicators

- Analysis of info to define objectives for sustainable tourism and key environmental, economic, cultural and social concerns
- Indicators developed to monitor sustainable tourism (including relevance, data needed, data sources, collection techniques)

Samoa Sustainable Tourism Indicators and Performance Measures

Environmental Sustainable Tourism Indicators	Result	Acceptable Range	Performance
Tourism village participation in marine protection	42%	50-75%	POOR
Hotels using secondary or tertiary treatment	8%	20-40%	POOR
Hotels composting biodegradable waste	76%	60-80%	ACCEPTABLE
Tourism sites passing water quality tests	50%	70-90%	POOR
Water usage per guest in hotels	928L	500-1000L	ACCEPTABLE
Economic Sustainable Tourism Indicators			
Proportion of hotel jobs in rural areas	48%	40-60%	ACCEPTABLE
Contribution of direct tourism to GDP	4%	10-20%	POOR
Social and Cultural Sustainable Tourism Indicators			
Villages included in tourism awareness programmes	28%	25-50%	ACCEPTABLE
Tourism operators informing tourists of village protocol	72%	50-70%	GOOD
Proportion of traditional events in tourism festivals	50%	50-70%	ACCEPTABLE
Sustainable Tourism Indicators			
Evaluation of quality of key tourist attractions	35%	60-80%	POOR
New hotels undertaking EIAs	33%	50-100%	POOR
Tourism operators using sustainable tourism practices	48%	60-80%	POOR

3. Monitoring of Indicators

- Indicators monitored
- “Acceptable Ranges” specified for each indicator based on local knowledge, baseline results and secondary sources

4. Interpretation of Results and Development of Action Plan

- Assess which indicators scored outside acceptable range
- Drew up sustainable tourism action plan to target priority areas e.g tourism village participation in conservation scored poorly thus village tourism awareness programs now run jointly with conservation department

Other

- Results instrumental in steering preparation of 2002-206 Samoa Tourism Development Plan and proposals for donor funding for projects
- Lesson: Demonstrates that although much effort was put in establishing the monitoring project the real challenge is in maintaining the monitoring in the long term.

Lessons Learned from TCAA

- Highly developed areas should opt "bottom up" decision-making process
- Less developed areas should opt "top down" decision-making process
- Best works for middle-sized areas (regions within a country)
- Best works in medium to less developed areas
- Selected areas should have precise administrative boundaries
- Identification and selection of tourism development scenarios is a crucial step
- Importance of integrating TCAA with other forms of planning such as ICZM or statutory

Appendix D. Background Paper

Carrying Capacity Assessment for Tourism Development in Fiji

Sally Patterson & Batiri Hughes
Institute of Applied Sciences

1. Background & Justification

In March '06 the Fiji Visitors Bureau predicted a 7% annual rise in visitor arrivals for the next decade (Fiji Times March 1 '06). Tourism is Fiji's largest industry, in 2004 earning over \$713 million in foreign exchange and employing approximately 45,000 people, thus the importance of ensuring the ongoing viability of this key industry. Initially visited by Australian and American cargo ships as a stop over port around 40 years ago, a few boarding houses and hotels were set up to capitalize on this influx of visitors. Since then due to increased government funding and marketing visitor numbers to Fiji have steadily increased from 208,000 in 1988 to 495,008 in 2005 and tourism is currently growing at a rate of approximately 11.4% per year since 2001 (Ministry of Tourism 2005),

However, positive contributions of tourism to a nations economy is often accompanied by negative trends in coastal resources. These include reduction of water resources, inappropriate disposal of solid waste, marine pollution, due to inadequately treated wastewater, degradation of biodiversity, loss of habitats, and coastal erosion. Negative social impacts may also be evident such as loss of local traditions, abandonment of traditional economic activities, degradation of social structure, excessive immigration etc (Trumbic 2005).

Studies have shown significant changes in the environment in tourism areas of Fiji including water quality and reef degradation such as in the Mamanucas and on the Coral Coast (Mosley and Aalbersberg, 2004) Social impacts of tourism in Fiji, although more difficult to define given they are not tangible, are just as relevant as the environmental and economic effects. Although tourism has been a positive gain for Fiji creating employment, improved infrastructure and increased revenue, tourism has also led to social stress such as conflict between developers and local communities often over land tenure issues. Other social impacts include changes in the traditional village life and culture (Levett and McNally 2003). A strategic environmental assessment of Fijis Tourism Master Plan suggested that in places like the Coral Coast and Mamanucas, carrying capacity under current management practices was likely being exceeded (Levett and McNally 2003).

Determining the Tourism Carrying Capacity (TCC) of Fiji's tourism areas is thus vital to ensure a balance between achieving optimal tourism development without compromising the delicate environmental and social structure of the nation, i.e sustainable tourism development which refers to tourism that is environmentally, socially and economically acceptable or tourism development within the carrying capacity.

This paper aims to explore the use of Tourism Carrying Capacity Assessment (TCCA) as a strategy for improving tourism development planning in Fiji. The second part of this paper defines and explores the concept of tourism carrying capacity, the parameters considered and selection of indicators, the third part reviews studies done in other countries and the fourth part discusses how it may be applied to the Fiji situation.

2. Tourism Carrying Capacity

2.1 Definition

The definition as per the World Tourism Organisation is “*The maximum number of people that may visit a tourist destination at the same time without causing destruction to the physical, economic and socio-cultural environment and an unacceptable decrease in the quality of visitor satisfaction.*”

Interpretations of the application of the concept of TCC vary. On the one hand “hardcore” advocates call for the identifying of the maximum appropriate number of users and limiting the amount and type of development permitted (Saveriades 2000). However, more accepted use of TCCA is that it is not a scientific concept nor a formula but a flexible management tool to guide tourism development in an area (Trumbic 2005). It should be used as a guiding tool for implementing sustainable tourism, while quantification should be made whenever possible. It may also be used to establish thresholds beyond which negative and undesirable impacts (on host area or visitor satisfaction) may occur (Min of Tourism, Malta 2001). Due to the complex set of issues involved, it is argued that the conditions needed to establish a numerical carrying capacity in reality are rarely achieved (McCool and Lime 2002) thus the question has to be recast from *how many people* an area can sustain to *what social and biophysical conditions are desired or appropriate* at a destination (Butler 1992).

2.2 Major Parameters/Data for TCCA (Tourism Carrying Capacity Assessment)

The different components of tourism carrying capacity (detailed below) may be identified. Different approaches are taken depending on the place, type of tourism and environment-tourism interface (European Commission 2002).

1. Ecological capacity – where biological and physical factors provide constraints to tourism development. e.g capacity of environment to absorb waste. Fixed component.
2. Cultural capacity – where impact on local community or availability of human resources is limiting factor for tourism development
3. Social capacity – where origin/background of tourists determines level of tourism considered acceptable. Perception of local community and tourists are determinants.
4. Infrastructural capacity – where current infrastructure systems are short term limiters to tourist numbers. Flexible component.
5. Management capacity – where key constraints are institutional and related to tourism development that can be managed (WTO 2004)

Three main groups of parameters are considered to determine the above and thus TCC and are weighted differently depending on place.

1. Physical-ecological all components of natural environment (ecosystems, length of coastline, climate, geomorphology, water resources, water quality, flora, fauna etc) which are fixed components (ecological capacity) and infrastructure systems (water supply, sewerage treatment, solid waste disposal, electricity, transportation, public services,) which are flexible components as their capacity can rise through investment, regulatory measures etc. Examples of thresholds include acceptable level of water pollution, acceptable level of degradation of coastal resources, intensity of use of facilities.
2. Socio- demographic- these include local communities, tourist populations and their interrelationships. Demographic (population, educational & health services, tourist numbers, tourist markets) easy to calculate whereas social are more difficult. Examples

of social include availability of skilled personnel, sense of identity of local community, tourist experiences. Thresholds difficult to evaluate as based largely on value judgements and include level of tourism that will be accepted by local communities, level of tourism without acceptable decline in visitor experience. Social carrying capacity refers to the levels of tolerance of host population and quality of experience of visitors to the area.

3. Political- economic – refers to the impacts of tourism on local economic structure i.e. number employed in different economic activities and distribution. It also relates to economic measures employed to stimulate tourism development such as investment. Also look at supply side. (Trumbic 2005).

2.3 Selection of Indicators

Indicators may be used to provide the critical information required to determine TCAA. Indicators measure existence or severity of issues, signals of problems, measures of risk and potential need for action. They are information sets that can be regularly used to measure changes of importance to tourism development and management including change in tourism structures, changes in external factors or impacts caused by tourism. They often relate to key issues such as natural resources and environment of an area, issues related to cultural assets and social values and concerns related to economic sustainability, thus are often tailored to a certain area. Criteria for selection of indicators include

- Relevance to key issues of an area (most imp)
- Practicality of generation and use (most imp)
- Credibility
- Clarity
- Comparability over time and space

Around 10 to 25 indicators are often chosen for practical implementation (WTO 2004). The tables below detail some of the critical and more appropriate indicators for coastal areas. A bench-mark figure/threshold will then need to be set for each indicator to measure it against.

1. Physical-ecological-infrastructurel

<i>Issue</i>	<i>Indicator(s)</i>	<i>Source of Data</i>
Existing facilities	Number of accommodation providers Number of beds Number of tourism service providers (tour companies, dive companies etc..)	Ministry of Tourism & transport
Energy management	Per capita consumption of energy (overall and by tourist sector) % businesses participating in energy conservation	Local energy authority, individual users
Water availability and conservation	Water use (overall and per tourist/day) Number of water shortages % or number business practice water conservation (reuse, reduce)	Water use utility, individual establishments
Drinking water quality	% tourism establishments with water treated to potable standards % local pop with access to treated water Frequency of visitors report water-borne illnesses	Individual establishments. Local health authorities
Sewage treatment	% of sewage in area receiving treatment (primary, secondary) and calculate separately for tourism % tourist establishments with adequate treatment	Health authorities Local authorities

Solid waste	Waste volume produced per month for area Methods of solid waste disposal Number tourism establishments involved in recycling % area covered by collection services Amount of litter in public areas	Surveys of properties Surveys of establishments and recyclers Local authorities Debris counts in public areas
Tourism Transportation	Modes of transport available/used by tourists to reach destination Frequency of use of different modes	Public authorities, tourism operators
Coastal Water quality	Level of contamination (faecal coliforms, nutrients, turbidity) Frequency of algae blooms	Health or environmental authorities
Climate Change/Environmental vulnerability	Frequency of extreme climatic events Value of damage annually	Weather services. Tourism industry
Protecting Critical Ecosystems	Number of protected/conservation areas or area Health of key indicator species/populations % reef in degraded condition (biol surveys)	Local authorities or conservation organisations Environmental agencies, universities
Tourism contribution to conservation	% businesses contributing to conservation	Conservation organisations, local authorities
Environmental management systems	% companies with a policy on environmental issues or number with staff designated for environment issues Staff trained on environment/sustainability issues	Individual establishments

2. Socio- demographic

<i>Issue</i>	<i>Indicator(s)</i>	<i>Source of Data</i>
Local Population	Total numbers Density Level immigration	
Tourist Population	Total Tourist Numbers per month Seasonality (peak tourist season)	International Visitor Survey (IVS)
Tourist Density	Number per square kilometer Number of visitors to reef areas	
Local satisfaction with tourism	Level of local satisfaction with tourism	Questionnaire or interviews with local residents in tourist areas
Community benefits associated with tourism Fundraising efforts by non local tourism operators (ie Korolevu Health Centre)	% indicate tourism improved social services and infrastructure number of community development programs in place from tourism (health, education etc)	Questionnaire Tourism businesses
Impact on community life/ Changes to lifestyle	Ratio of tourists to locals (average and peak) % changed to more western culture of dress, diet etc. % inform tourists about local protocol number of conflicts within local communities related to tourism	Surveys, stats Interviews
Tourist satisfaction	Level of satisfaction on exit (for number issues) % of return visitors	IVS
Tourist health and safety	Number reported illnesses of tourists Number facilities that received training in food hygiene Number incidents of crime on tourists	Statistics (health, police)
Social responsibility	% business with policies aimed at social issues with local communities (e.g employment, support for development etc)	

3. Political- economic

Tourist Expenditure/ Revenue	Spending per tourist Occupancy rates Average length of Stay	Ministry of Tourism
Economic dependence	Contribution to GNP/GDP	
Employment	Total number locals employed (men & women) % employed in tourism % jobs full time or permanent	Surveys, Census data
Tourism seasonality	Tourism arrivals by month Occupancy rate by month	Tourism statistics
Investment	Number of tourism businesses/operators in area % locally owned	
Revenue	Number informal activities benefiting from tourism (e.g handicrafts, sale of ag products, tours etc) Total tourism revenues for area (growth rate) or annual profit from tourism businesses	
Marketing	Volume of marketing collateral products by type (ie TV and print advertising)	Records of tourism authority
Existence Local/Regional Planning & Development Control	Existence of land use/development/tourism planning process % facilities have had impact assessments conducted % regularly inspected by local authorities	Planning authorities

2.4 Steps in carrying out a TCAA

The first guidelines for the assessment of TCCA were developed around 1995 and were tested in the Mediterranean region and recently for Malta and Egypt (Trumbic 2005). To assess the tourism carrying capacity of a region it is important to identify the level at which tourism can be maximized by both the host and the visitor without effecting the integrity of the destination.

The PAP (Priority Actions Program) Guidelines for CCA for tourism in Mediterranean Coastal Areas propose that the following five steps are undertaken in TCAA.

1. Collection of data (characteristics of area, tourism, economy, population etc)
2. Analysis & Synthesis: interpreting and understanding complexity of situation (limitation and controls, evaluation of tourism resources and demand)
3. Preparation of tourism development options (different scenarios and selection)
Selected development scenario for sustainable tourism should be both environmentally and socio-culturally acceptable and economically feasible. Once the scenario is selected the carrying capacity would have been roughly defined.
4. TCAA formulation phase. (Carrying capacity defined by the component which is most limiting or define the lowest threshold) including proposal of physical distribution of tourism development.
5. Application, monitoring and evaluation

In addition, the methodology is based on two elements:

- a) flexibility of physical-ecological, socio-demographical, political-economic parameters which need to have equal treatment
- b) a necessity for the analysis of different scenarios before final assessment of carrying capacity
(PAP 1999)

It is also suggested that rather than a numeric estimate for carrying capacity, managers make use of a range of indicators to provide information on implications of different levels and types of use for the destination. It is noted that the above steps mainly refer to an area for which tourism development is anticipated but can still be adapted for established areas.

3. Examples/Case Studies of TCAA

In spite of the vast amount of literature of theoretical nature on the subject, the concept appears difficult to put into practice thus there is limited experience in not only implementing carrying capacity but also measuring it (EC 2002). Studies have been done however for Malta, areas of Egypt, and parks in Switzerland and Spain.

3.1 Malta- Country (Min of Tourism, Malta 2001).

Malta is a developed and highly urbanized Mediterranean country. Tourism contributes around 24% to GNP and in 2000 hosted 1.2 million visitors. In the late '90s the Ministry of Tourism commissioned a study to establish a TCCA for the country to define a tourism development scenario deemed most appropriate. The following process was followed:

1. Research carried out to determine physical/ecological, socio-cultural and economic-political parameters and included reviewing tourism stats, visitors survey, socio-cultural impact surveys, and state of the environment report.
2. Assessment of implications of data collection stage.
 - Physical-ecological environment: concentration of attractions, level of urbanization, environmental deterioration, infrastructure pressure.
 - Economic-political: dependency of economy on tourism, seasonality.
 - Socio-cultural: socially acceptable levels of tourism, impact on cultural identity, satisfaction saturation levels.
3. Outlining tourism development options:
 - Free development
 - Intensive tourism with some control
 - Limited development (alternative tourism)
 - Sustainable tourism development
4. Once sustainable development option chosen parameters chosen to monitor. Economic (Increase foreign earnings from tourism, increase per capita expenditure)
Environment/Resources (use of resources, impact on infrastructure)
Socio-cultural (visitor satisfaction).

The main determinant of the capacity assessment was the market. Tourism carrying capacity was expressed in the terms of bedstock and a 65% occupancy rate deemed necessary for the accommodation sector to be viable. A rapid increase in bedstock was not supported by market expectations and was predicted to lead to low occupancy rates and a decrease in host tolerance levels. A "limited growth" option was thus chosen with "improvement of current facilities: considered more of a priority than " adding to the product".

3.2 Fuka-Matrouh area – Egypt (tourism area) (PAP 1999)

In the mid-90s a TCAA was conducted on a 70 km long coastal area in Egypt which was in its initial phase of tourism development. The TCCA was prepared simultaneously with the implementation of a Coastal Area Management Programme. The inclusion of CCA in the integrated planning was seen to be necessary for successful tourism and economic

development of the area. The assessment also involved data collection, analysis and assessment of development options.

1. Information mainly on physical parameters were collected e.g statistics, ICM plans & reports, information from observations and discussions with relevant authorities and visits to area including questionnaire for local population (response to tourism in area, employment, trade with tourists etc).
2. Three main types of info (physical-ecol-infrastruct, socio-demographic, political-economic) were analyzed. Main features were natural attractions (beaches, climate) and cultural attractions. Main issues were availability of good roads, lack tourist services, seasonality of tourism, lack of human capacity in industry, large part coast already occupied large resorts, positive reaction to tourism development)
3. Tourism Development options were prepared
 - Without restrictions and control (continuation of existing trends)
 - Free transfer to commercial interests for overall development predominantly by foreigners
 - Alternative tourism- ecotourism – strict protection
 - Sustainable tourism development
4. CCA formulation phase and proposed development of tourism: Based on sustainable tourism development scenario. Achievement largely political decision and development of tourism will need to be adapted to existing distribution of tourist resorts. Therefore the structure of tourism development and support services is not most desirable one but what is realistic in actual circumstances.

In relation to carrying capacity, the three main parameters are described to indicate the main quantitative and qualitative capacity levels of the area.

- Physical-ecological parameters: beach capacity (125000 to 220000) and accommodation capacity (95,000 to 165,000 visitors) and related to transport and communication networks and water supply, sewage and waste disposal systems
- Socio-cultural parameters: assess local population structure (high illiteracy and low education standard, young population) and socio-cultural institutions: ratio of local population to visitors may not exceed ration 2.5 to 1.
- Political-economic: assess tourism policies (integrated planning).

Last two parameters impose constraints on carrying capacity defined by physical parameters, thus an estimate maximum accommodation capacity in terms of visitors was put at 80,000 to 100,000).

3.3 Lessons Learned

Lessons learned from the application of TCAA to case studies include:

- Highly developed areas should opt “bottom up” decision-making process
- Less developed areas should opt :top down” decision-making process
- Best works for middle-sized areas (regions within a country)
- Best works in medium to less developed areas
- Selected areas should have precise administrative boundaries
- Use of indicators for analysis of tourism development options
- Identification and selections of tourism development scenarios is a crucial step
- Importance of integrating TCAA with other forms of planning such as ICZM or statutory planning
(Trumbic 2005).

4. TCCA for Fiji

4.1 Tourism Areas

Predominately tourism activity in Fiji is centered around the western coast of Viti Levu and off lying islands with over 70% of all visitors staying in the tourism areas of Nadi, Coral Coast and the Mamanucas (2005 International Visitor Survey report). The main reasons for this trend is the high level of infrastructure which include accommodation, good roads and beach access and proximity to airports in these regions. International marketing by the larger hotel chains and tour companies has also built greater awareness and demand for these areas.

Tourism destinations in Fiji may be classified into 3 categories using the presence of the 5 A's as a measure of its level of involvement, they are: Access, Attractions, Activities, Accommodation and Amenities (Northern Territory Destination Development Strategy 2004)

1. Mature (includes all A's)
2. Developing (has most A's)
3. Emerging (has few A's)

The mature areas include:

Coral Coast, Denarau (Nadi) and Mamanucas, these areas are well established and have all infrastructure required to deliver a high quality tourism experience and are heavily marketed overseas.

The developing areas include:

Yasawas, Kadavu, Vanua Levu – Savusavu, Taveuni these areas are usually sought out by slightly more intrepid travelers (backpackers and adventure seekers) and while they are mostly established, access can be expensive and the product a bit rough.

The emerging areas include:

East Coast of Viti Levu, Viti Levu interior. These destinations have little to no marketing and are visited by experienced travelers seeking a challenging experience off the beaten track.

4.2 Constraints & Limitations

Seasonal trends mean a high volume of visitors, particularly from Australia and NZ come during the cooler months of June, July and August, adding strain to the high use areas. Infrastructure including power and water and transport and waste disposal are often limited and under pressure as are the natural resources such as the coral reefs, fish stocks, walking tracks and waterways.

Constraints to tourism development in Fiji that should be taken into account while undertaking assessment of carrying capacity and choosing of indicators include the following:

- Sensitive environment and ecosystems
- Climate Change impacts
- Economic dependence on tourism
- Adequate waste management systems
- Adequate and quality water supply systems
- Limited management/administration skills of local operators
- Accessibility to destinations away from main access roads

- Limited development away from main tourism regions
- High cost of air transfers
- Lack of cultural understanding between operators and indigenous land owners
- Unique local traditions and importance of retaining cultural identity
- No governing body to monitor customer service, environmental practices or accredited level of safety.
- Rising cost of Public Liability Insurance
- World events and the change in visitor travel trends ie Terrorism attacks, Bird flu, petrol prices, airline petrol levies, competing destinations
- Changing tourism trends i.e. falling backpacker market

4.3 TCCA Methodology for Fiji

In summary, to determine the TCCA for a tourism area or destination in Fiji a set of monitorable indicators should be used. The indicators are chosen from the three categories above. A bench-mark or a number figure then needs to be set for each of these indicators to measure the desired carrying capacity of each indicator. The assessment will be undertaken using a variety of research methods to gather the data including both qualitative/quantitative surveys and conducting focus groups with tourism operators, visitors and local villages members. Other research material from secondary sources ie previous studies and internet material will also be utilized.

Question: Who will set the indicator levels??

4.4 Recommendations

It is recommended that the following be undertaken:

1. Discussion of this paper amongst all relevant stakeholders involved in tourism planning to determine process of undertaking TCAA in Fiji, indicators to use, and areas to test process out on. These stakeholders would include:
 - Ministry of Tourism
 - USP (IAS, Department of Tourism)
 - Department of Town and Country Planning
 - Department of Fisheries
 - Lands Department
 - Ministry of Fijian Affairs
 - All tourism operators (accommodation and tour)
 - Fiji Visitor Bureau
 - Public Works Department
 - Environment
 - Tourism Resource Owners
 - Native Land Trust Board
2. Collect information and undertake a series of surveys using the identified indicators and distribute to visitors, tourism operators and local communities
3. Conduct two tourism carrying capacity case studies, using a mature destination (i.e. Coral Coast) and an emerging destination (Kadavu or Taveuni?) to assess the appropriate development options for each area. Identifying issues present in the mature destination will allow us to prepare and avoid replicating these mistakes. Who will undertake this assessment will also need to be discussed.

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