

# Measuring regional well-being

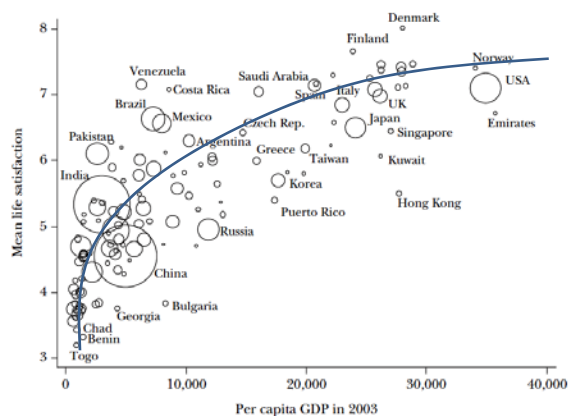
## Options and challenges

Natalie Stoeckl  
School of Business & The Cairns Institute



## GDP is NOT a good measure of well-being

Life Satisfaction and Per Capita GDP around the World



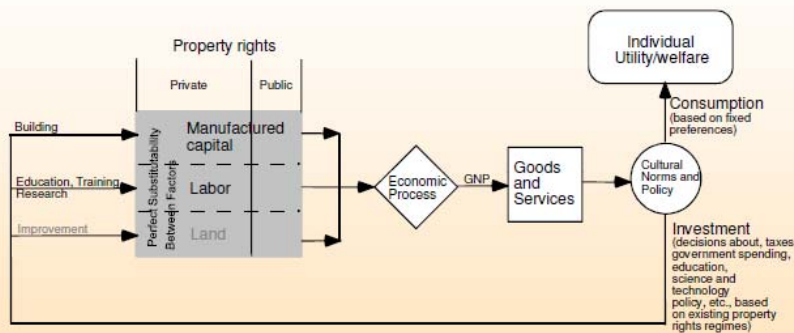
Source: Penn World Tables 6.2.

Note: Each circle is a country, with diameter proportional to population. GDP per capita in 2003 is measured in purchasing power parity chained dollars at 2000 prices.

See: <http://filipsagnoli.files.wordpress.com/2008/09/happiness-and-income-cross-country.png>



### "Empty World" Model of the Economy



Basic premises:

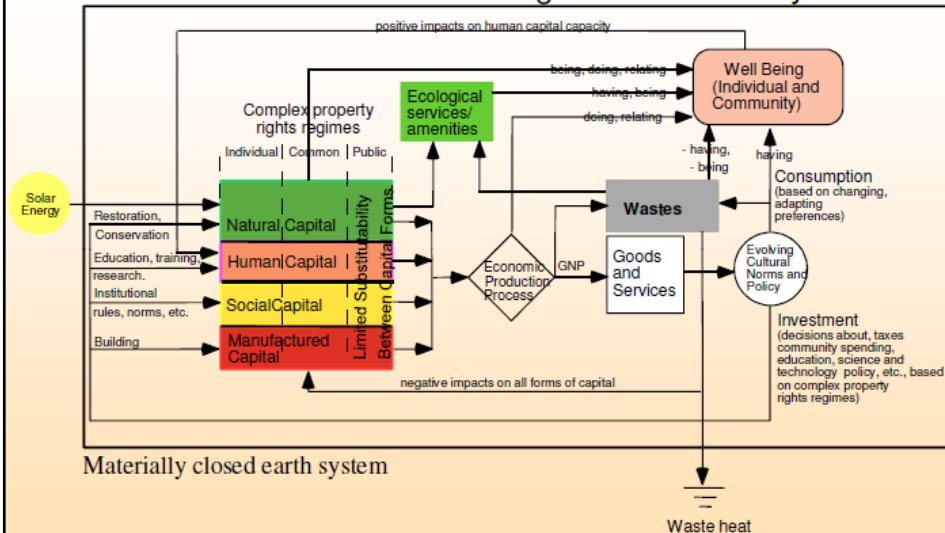
More is always better

The economy can grow forever

Private property is always best

From: Costanza, R., J. C. Cumberland, H. E. Daly, R. Goodland, and R. Norgaard. 1997. An Introduction to Ecological Economics. St. Lucie Press, Boca Raton, 275 pp.

### "Full World" Model of the Ecological Economic System



From: Costanza, R., J. C. Cumberland, H. E. Daly, R. Goodland, and R. Norgaard. 1997. An Introduction to Ecological Economics. St. Lucie Press, Boca Raton, 275 pp.

## Key point: Well-being is about far more than just money

- Key challenges:
  - Working out what one should include (although there is general agreement about needing a range of different measures)
  - Ensuring one can find good quality data
    - Across countries, regions, communities or people?
    - Across time?
  - Working out how to present the information
    - As one, combined 'indicator' that hopes to capture all?
    - As a list of variables?
    - As a weighted list of variables?



## Some examples

- Genuine Progress Indicators (global and national scale)
- State of the Tropics project (transnational and national scale)
- Northern Profiling project (regional scale)
- What is the good life (community scale)
- Northern Australian investigations into the relative importance of factors to overall quality of life, and people's satisfaction with those factors (individual scale)



# Genuine Progress Indicator (global and national scale)



## Genuine Progress Indicator (or ISEW) by Column

Additions

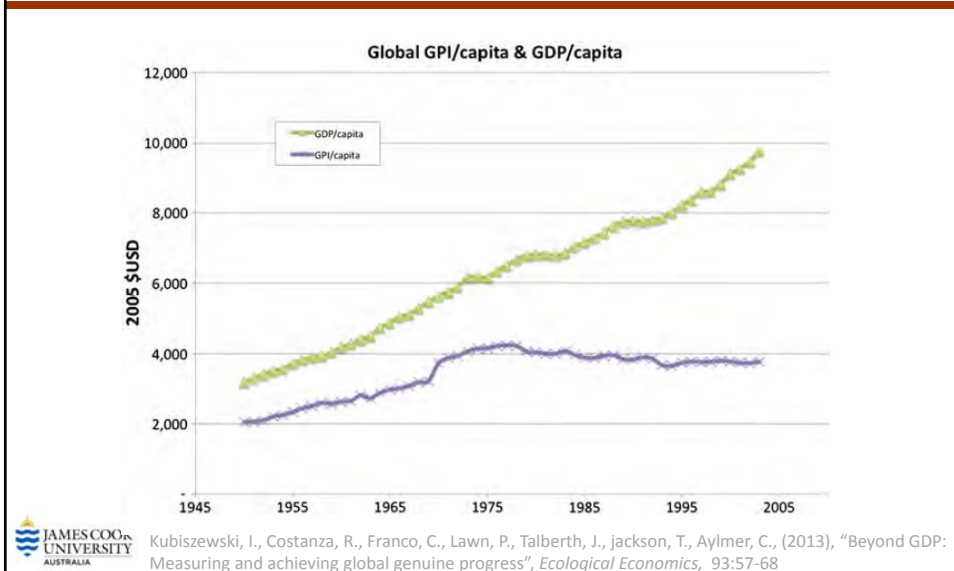
Column A: Personal Consumption Expenditures  
Column B: Income Distribution  
Column C: Personal Consumption Adjusted for Income Inequality  
Column D: Value of Household Labor  
Column E: Value of Volunteer Work  
Column F: Services of Household Capital  
Column G: Services Highways and Street

Subtractions

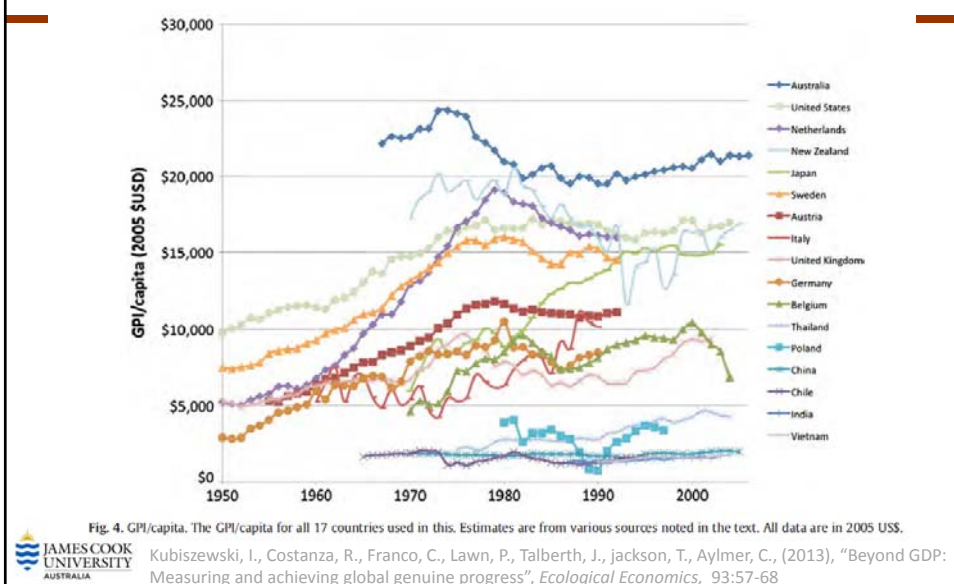
Column H: Cost of Crime  
Column I: Cost of Family Breakdown  
Column J: Loss of Leisure Time  
Column K: Cost of Underemployment  
Column L: Cost of Consumer Durables  
Column M: Cost of Commuting  
Column N: Cost of Household Pollution Abatement  
Column O: Cost of Automobile Accidents  
Column P: Cost of Water Pollution  
Column Q: Cost of Air Pollution  
Column R: Cost of Noise Pollution  
Column S: Loss of Wetlands  
Column T: Loss of Farmland  
Column U: Depletion of Nonrenewable Resources  
Column V: Long-Term Environmental Damage  
Column W: Cost of Ozone Depletion  
Column X: Loss of Forest Cover  
Column Y: Net Capital Investment  
Column Z: Net Foreign Lending and Borrowing

■ Built Capital  
■ Human Capital  
■ Social Capital  
■ Natural Capital

## Genuine progress versus GDP - global



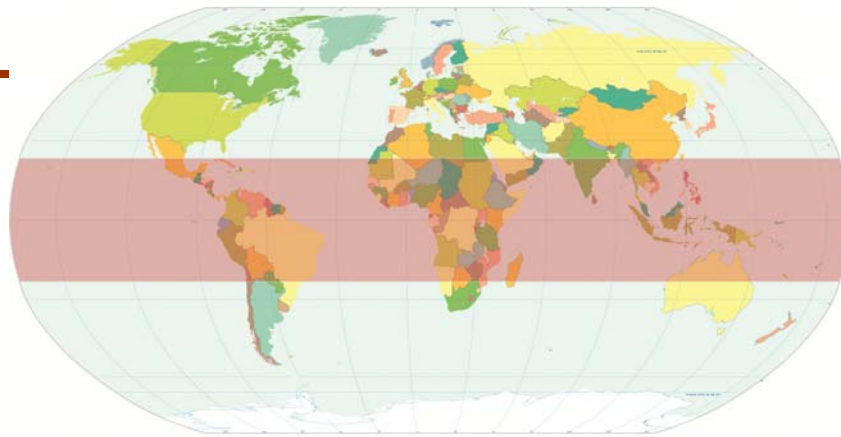
## Genuine Progress Indicator



## State of the Tropics Project (Transnational and national scale)



[www.stateofthetropics.org](http://www.stateofthetropics.org)



Is life in the Tropics getting better?

## The Project

- **Global and collaborative:** 12 institutions
- **The Tropics:** 109 nations
- **Rest of the World:** 107 nations, as counterpoint
- **Eight regions:** (Central & Southern Africa; Northern Africa & Middle East; South Asia; South East Asia; Caribbean; Central America; South America; Oceania)
- **Eight 'straddling' nations:** split out Tropics/ non-Tropics
- **~50 indicators:** limited by data availability; output indicators
- **Data sources:** World Bank, IMF, United Nations, UNESCO, UNICEF, FAO, IUCN, WHO etc
- **Analysis:** descriptive; high level, longer term regional trends (not looking 'inside' nations)
- **Context:** Tropical Australia 0.04% of Tropics' population

## Is life in the Tropics getting better?

### Yes, no, maybe....

Compared with the Rest of the World:

- Life expectancy is lower & more people live in poverty
- Disease burden is higher
- Crime and corruption is higher
- GDP per capita is lower & public debt is higher
- Environmental degradation is occurring at a faster rate
- Losing primary forests, corals reefs and mangrove forests

### BUT ... ..

- Significant progress on many social indicators over past 50 years
- Considerable regional variation
- Challenge is to improve living standards 'responsibly'



## The Ecosystem

| Domain         | Indicator                           | Getting better?                                    |
|----------------|-------------------------------------|----------------------------------------------------|
| Atmosphere     | CO <sub>2</sub> emissions           | Increasing ✗                                       |
|                | Electricity generation              | Increasing but so is renewable energy generation ✓ |
|                | Air pollution                       | PM <sup>10</sup> decreasing ✓                      |
| Land and Water | Land degradation                    | Increasing ✗                                       |
|                | Agricultural land                   | Increasing ✗ but so is productivity ✓              |
|                | Renewable water resources           | No time series                                     |
| Oceans         | Fish production – wild marine catch | Stabilising after rapid increases ✗                |
|                | Fish production – aquaculture       | Increasing ✓ ✗                                     |
|                | Coral reefs                         | Declining ✗                                        |
|                | Mangroves                           | Declining ✗                                        |
| Biodiversity   | Biodiversity and threatened species | Declining ✗                                        |
|                | Protected areas                     | Increasing ✓                                       |
|                | Extent of primary forests           | Declining ✗                                        |



## The Human System - Society

| Dimension    | Indicator                                     |                                                                                  |
|--------------|-----------------------------------------------|----------------------------------------------------------------------------------|
| Poverty      | Population living on less than \$1.25 per day | Decreasing ✓                                                                     |
|              | Undernourished population                     | Decreasing ✓                                                                     |
| Urbanisation | Urban population                              | Increasing ✓ ✗                                                                   |
|              | Slum population                               | No time series – more slums in the Tropics than Rest of the World                |
| Health       | Life expectancy                               | Increasing ✓                                                                     |
|              | Maternal and child mortality                  | Decreasing ✓                                                                     |
|              | Obesity and non-communicable diseases         | Increasing ✗                                                                     |
|              | HIV and AIDS                                  | Prevalence has increased but death rate declining                                |
|              | Tuberculosis                                  | Declining (except PNG) ✓                                                         |
|              | Malaria                                       | No time series – disease burden much higher in the Tropics ✗                     |
|              | Dengue and neglected tropical diseases        | No time series and unreliable data – disease burden much higher in the Tropics ✗ |
| Education    | Mean years of schooling of adults             | Increasing ✓                                                                     |
|              | Child and adult literacy                      | Increasing ✓                                                                     |
| Work         | Unemployment                                  | Decreasing overall but variable ✓                                                |



## The Human System - Economy

| Dimension                          | Indicator                                 |                                   |
|------------------------------------|-------------------------------------------|-----------------------------------|
| Economic Output                    | GDP per capita                            | Increasing ✓                      |
| International trade and investment | Exports of goods and services             | Increasing ✓                      |
|                                    | Imports of goods and services             | Increasing ✓                      |
|                                    | Foreign direct investment, net inflows    | Increasing ✓                      |
| Science and technology             | Research and development expenditure      | Increasing (poor data coverage) ✓ |
|                                    | Enrollment in higher education            | Increasing ✓                      |
|                                    | Scientific and technical journal articles | Increasing ✓                      |
| Government                         | Public sector debt service burden         | Decreasing but highly variable ✓  |



## The Human System - Governance

| Dimension            | Indicator                                     |                                                        |
|----------------------|-----------------------------------------------|--------------------------------------------------------|
| Human security       | Refugees                                      | Decreasing but highly variable – updated data required |
| Crime and corruption | Homicide rate                                 | No time series but rate much higher in the Tropics ✖   |
|                      | Corruption                                    | No time series but more prevalent in the Tropics ✖     |
| Gender equality      | Ratio female to male with secondary education | Increasing ✔                                           |
|                      | Women in national parliament                  | Increasing ✔                                           |
| Infrastructure       | Gross capital formation                       | Increasing ✔                                           |
|                      | Access to improved water                      | Increasing ✔                                           |
|                      | Access to improved sanitation                 | Increasing ✔                                           |
| Communication        | Mobile phone subscriptions                    | Increasing ✔                                           |
|                      | Internet users and broadband subscriptions    | Increasing ✔                                           |



## Northern Profiling Project (regional scale)



**Socio-economic profiling of tropical rivers**  
Prepared by Silva Larson & Kostas Alexandridis  
April 2009

**TRaCK**  
Tropical Rivers and Coastal Knowledge

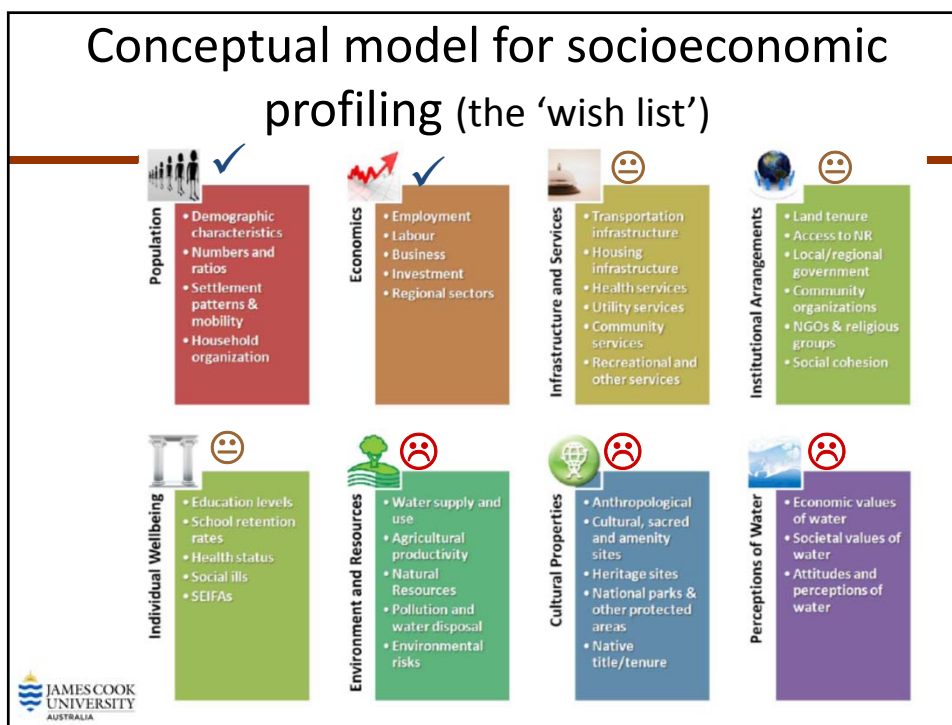


 **CSIRO**

 Australian Government  
Department of the Environment,  
Water, Heritage and the Arts  
Land & Water Australia  
National Water Commission

 **JAMES COOK UNIVERSITY**  
AUSTRALIA

Larson, S. and Alexandridis, K. (2009) Socio-economic profiling of tropical rivers. Land & Water Australia, Canberra, available at: <http://www.track.org.au/publications/registry/track422>



## Data used for profiling

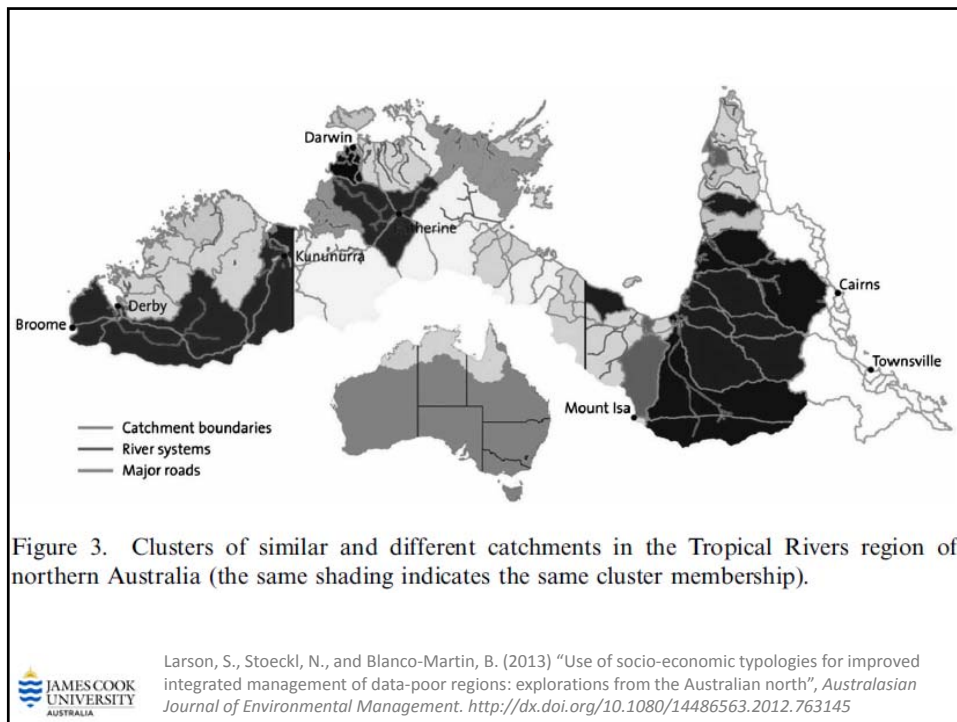
- Demographic Characteristics
  - Population, People, Age
  - Mobility, Population Change
- Economic Parameters
  - Unemployment, Income
  - Industry of Employment
  - Number of Businesses
  - Number of Mines
- Individual Wellbeing
  - Family Income + loan payments
  - Household size + One-parent families
  - Women with >3 children
  - % pop with no school
  - % pop with <= year ten schooling
  - % population with no religion
  - % houses only speaking English
- Infrastructure and Services
  - Roads, Airports, Schools
  - Internet connections,
  - Persons per bedroom
  - Housing tenure, vehicle access
  - Remoteness Index
- Institutional Arrangements
  - Number of registered community organisations
  - Volunteering
- Environment and Culture
  - No of major dams, Outflow
  - Availability of perennial water
  - Soil quality, Land use
  - Cyclone risk
  - Number of registered cultural sites



## Key messages from the profiling activities

- Data difficulties abound
- Urban and Rural areas differ demographically and socio-economically
- Also significant differences between and within rural areas
  - Biophysical
  - Cultural
  - Opportunities for development (mining, agriculture, tourism)
  - Infrastructure (hard and soft)
  - Human, social & institutional capital
- Some catchments are socioeconomically 'similar' in many ways but catchments are not always clustering within the same 'group'.
  - Indicates complexity, that needs further investigation.





## "What is the good life?" Project (regional scale)

## What is a good life?

### Understanding Community Wellbeing in Tropical Regions

Project leader: Prof Gianna Moscardo  
Cairns Institute, School of Business James Cook University



## What the program is about

- Measuring and understanding community well-being in tropical regions.
- Critically evaluating the impacts of particular forms of development on community well-being:-
  - Support for small/micro business
  - Types and patterns of tourism development
  - Issues related to work-life balance
  - Markets for local food



## Why do we need this program?

- Existing discussion is too narrowly focused on aspects of finance and wealth
  - Existing systems at the national and state level don't provide sufficient, reliable detail for regions
  - Existing systems have been designed mostly within northern hemisphere, urban, affluent, developed, temperate, contexts
  - There are regional/tropical dimensions that don't get covered in existing systems
    - Frequency and types of natural disasters
    - Problems of population dispersal/distance
    - Managing diverse cultural/ethnic groups within regions
- 
 Living in/around and with important & protected ecosystems

## What the program includes

- Investigations into what matters for community well-being in Australian tropical regions
- The development and trial of a Tropical Regional Community Well-being Indicator System
- More detailed examination of specific issues

## What Matters for Community Well-being in the Tropics

- Analyzed existing data from various regional planning exercises,
- Added to that using interviews with key informants and additional resident surveys and stakeholder workshops
- Reviewed research and indicator systems used in other Tropical places
  - Includes the larger JCU State of the Tropics exercise



## The Trial Indicator System

- Describe the ideal system (the blank cheque version)
  - Objective measures (information of services and community characteristics)
  - Subjective measures (what residents and other stakeholders feel and believe)
- Create profiles for several regions in Tropical North Queensland using existing objective data and seek stakeholder feedback on those
  - Plan to have these available late 2013
- Connect the system to others to ensure efficiency and ability to make comparisons
  - Commenced building links to Community Indicators QLD, Community Indicators Victoria, the Australian Community Indicators Network, the Australian National Unity Index, and Australian National Development Index



Mindful of the State of the Tropics and the measures of Australian Progress

## Northern Australian investigations into the relative importance of factors to overall quality of life (individual scale)



## The importance of different factors to overall quality of life in Northern Australia

- Results from studies funded by
  - The Northern Australia Water Futures Assessment
  - The National Environmental Research Program
- Overview of study currently underway in wet tropics world heritage area
- Overview of studies being undertaken by PhD students
- Why relevant to other 'indicator' studies?
  - Helps prioritise long lists of 'indicators', identifying those which residents think most/least important



## The importance of the socio-cultural 'values' associated with Australia's tropical rivers, compared to other 'values'.

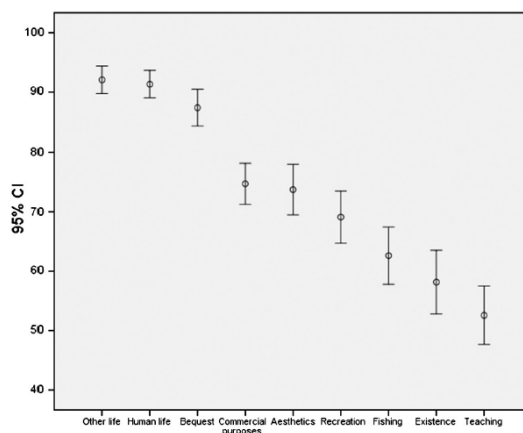


Fig. 2. Confidence intervals for importance scores assigned by respondents to a cross-section of values of the rivers.



Larson, S., Stoeckl, N., Welters, R., and Neil, B. (2013) "Using resident perceptions of values associated with the Australian Tropical Rivers to identify policy and management priorities", *Ecological Economics*, 94:8-19

## Larson's 'Index of dis-satisfaction'

Table 4

Index of Dissatisfaction (IDS) for river values across the TR region; higher values indicate greater importance, dissatisfaction and/or a higher per cent of respondents provide information about the value.

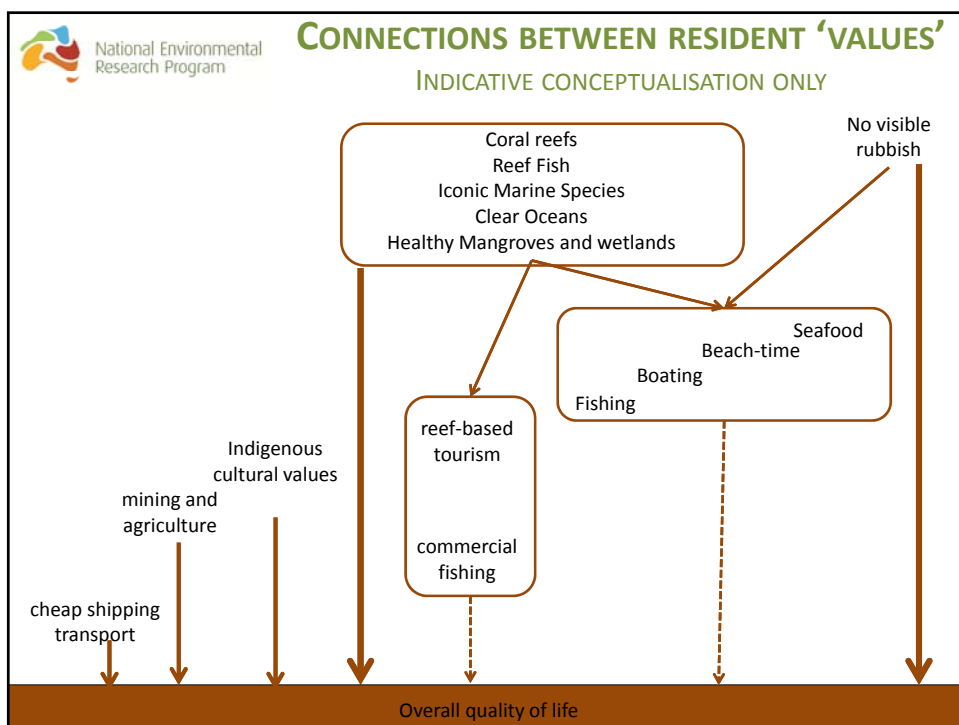
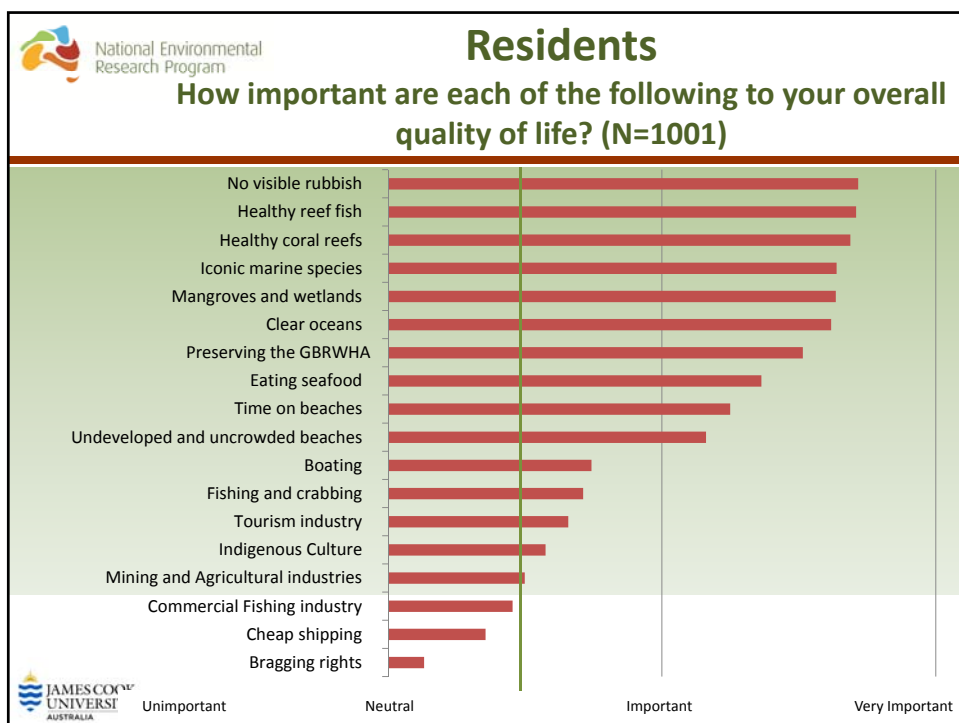
| Rivers for...            | Mean I <sup>a</sup> | Mean S | % selecting | IDS | Reasons for dissatisfaction (concerns)                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------|---------------------|--------|-------------|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ... Commercial purposes? | 78                  | 70     | 95          | 22  | - Pollution (from mines)<br>- Use/over-use by tourism, irrigation, commercial, domestic<br>- Need for better monitoring<br>- The cost of water and uncertainty about future access                                                                                                                                                                                                                                                       |
| ... Human life?          | 93                  | 79     | 98          | 19  | - Need for capture and storage (need for dams) and for improved water recycling<br>- Poor water quality (chemicals)<br>- Boundaries and regulations/Government restrictions<br>- Use/over-use (too many bores/cattle watering points, exports to Perth, tourism)<br>- Need for capture and storage (store rain water)<br>- Need to improve environment around rivers, more trees<br>- Concern for the future – water is not looked after |
| ... Other life?          | 95                  | 81     | 97          | 18  | -                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| ... Bequest?             | 92                  | 79     | 95          | 18  | -                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| ... Fishing?             | 72                  | 75     | 87          | 16  | - Difficulty of access/need for permits<br>- Rivers overfished and overcrowded by fishers                                                                                                                                                                                                                                                                                                                                                |
| ... Recreation?          | 78                  | 78     | 89          | 15  | - Presence of crocodiles<br>- Many rivers/waterholes inaccessible<br>- Lack of rangers and attention by Council                                                                                                                                                                                                                                                                                                                          |
| ... Teaching?            | 66                  | 72     | 80          | 15  | - Uncertainty with access;<br>- Insufficient acknowledgment of Indigenous rights                                                                                                                                                                                                                                                                                                                                                         |
| ... Aesthetics?          | 81                  | 79     | 91          | 15  | -                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| ... Existence?           | 80                  | 78     | 73          | 13  | - Crocodiles <sup>b</sup>                                                                                                                                                                                                                                                                                                                                                                                                                |

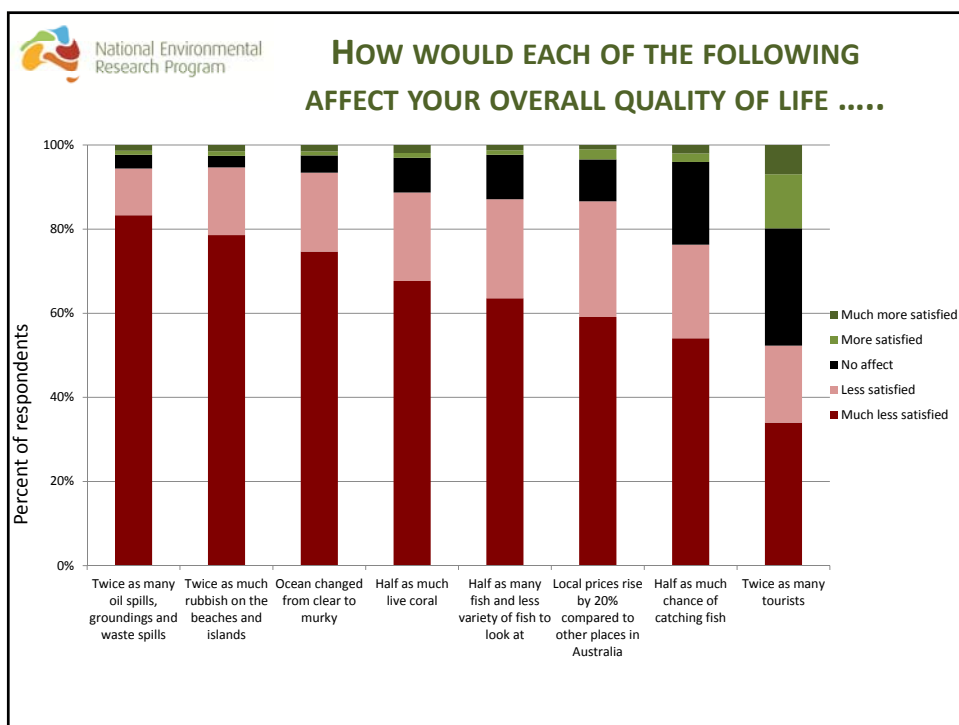
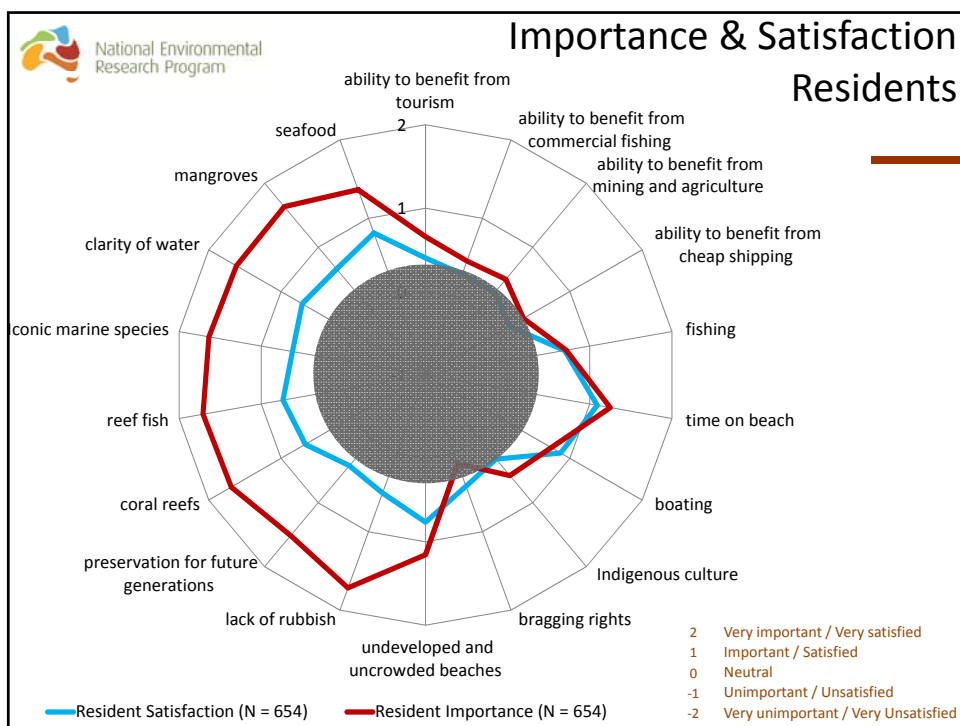
<sup>a</sup> These mean values do not exactly coincide with those presented in Fig. 2 because they only include data from respondents who answered both the importance and the dissatisfaction questions relating to each factor.

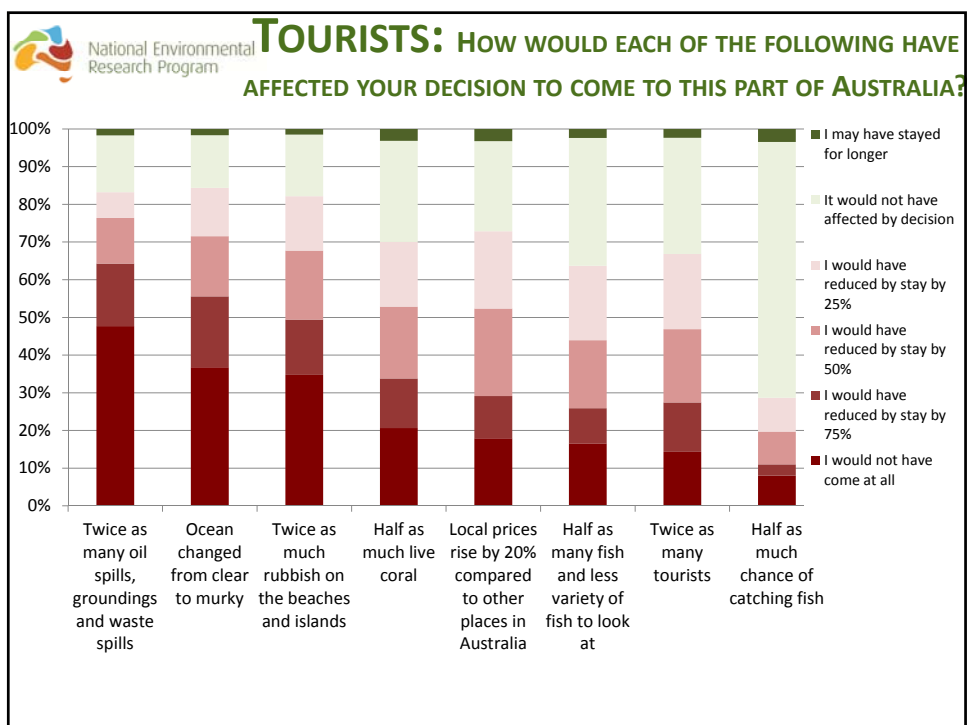
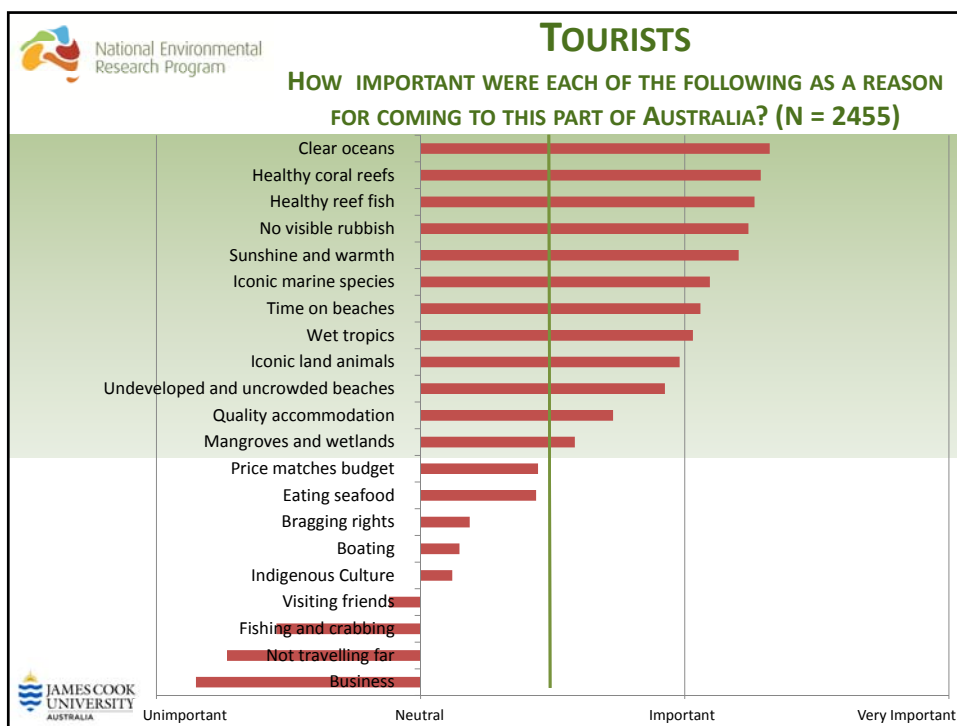
<sup>b</sup> This comment most likely explains why some people do not use the rivers for recreational purposes but instead simply enjoy them for their 'existence' value.



Larson, S., Stoeckl, N., Welters, R., and Neil, B. (2013) "Using resident perceptions of values associated with the Australian Tropical Rivers to identify policy and management priorities", *Ecological Economics*, 94:8-19







|                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>National Environmental Research Program</p>                                                                           |  <p><b>Benefiting either directly or indirectly from the jobs &amp; incomes created by:</b></p> <ul style="list-style-type: none"> <li>The tourism industry</li> <li>The mining industry</li> <li>The agricultural industry</li> <li>Other industry/sector (e.g. fishing, retail, education etc.)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p><b>Current project TE NERP 12.3 – collecting data from residents of and tourists to the Wet Tropics World Heritage area</b></p>                                                                         |  <p><b>Being able to access the rainforest via:</b></p> <ul style="list-style-type: none"> <li>Walking tracks &amp;/or dirt roads</li> <li>Bitumen roads &amp; bridges</li> <li>Rail/Skyrail</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <p>Note the addition of social/community questions (compared to GBR study, focusing only on economy and environment)</p>  |  <p><b>Being able to:</b></p> <ul style="list-style-type: none"> <li>Learn more about a unique &amp; ancient Australian environment</li> <li>Hear from Aboriginal people about their sense of place (culture &amp; country)</li> <li>Go on rainforest walks</li> <li>Visit waterfalls &amp;/or swim in clear, clean rivers/streams/waterholes</li> <li>See iconic species in the wild (e.g. cassowary, kangaroos, rattle birds, etc.)</li> <li>Relax and/or reflect in a natural environment</li> <li>Enjoy uncrowded camping &amp; picnic areas</li> <li>Enjoy the scenic beauty &amp; peacefulness of the rainforest (sights, sounds &amp; smell)</li> </ul>  <p><b>Having:</b></p> <ul style="list-style-type: none"> <li>Healthy native plants &amp; animals (e.g. free from diseases, pests &amp; weeds)</li> <li>Beautiful undeveloped scenery to look at</li> <li>Two world heritage sites side-by-side (i.e. the WTWHA and the GBRWHA)</li> </ul>  <p><b>Protecting:</b></p> <ul style="list-style-type: none"> <li>Places that have Aboriginal cultural values</li> <li>Places that have other cultural values (e.g. European/Asian)</li> <li>The WTWHA either for its own sake or for future generations (even if you have never been there &amp; never plan to go)</li> </ul>  <p><b>Being able to:</b></p> <ul style="list-style-type: none"> <li>Spend time with friends &amp; family</li> <li>Enjoy city-entertainment (e.g. spending time at cafés, museums, etc.)</li> <li>Have some 'control' over what is happening in your life</li> <li>Join in community activities (e.g. attend cultural/environmental festivals)</li> </ul>  <p><b>Knowing that:</b></p> <ul style="list-style-type: none"> <li>Friends &amp; family are healthy &amp; safe</li> <li>Good quality roads, hospitals, schools, etc. are there if need be</li> </ul> |

## Cardinal indicators of Utility / Life satisfaction

$$LS = f(\text{environment, income, age, gender, etc})$$

Have several PhD students who are

- 1) conducting surveys where they ask about
  - Overall life satisfaction
  - Income, age, gender, etc.
- 2) Collecting other 'external' data about state of the environment, etc
- 3) Planning to estimate these life-satisfaction equations, to determine how much each of these factors contributes to overall quality of life

Studies in

- The Philippines (with particular focus on impact of flooding)
- China (with particular focus on impact of coal mining)
- Northern Australia and Costa Rica (with particular focus on impact of biodiversity)

## Concluding comments

- Important to look at more than just money
- Different people are likely to think that different things are important, so may need to consider ways of allowing for that  
<http://www.oecdbetterlifeindex.org/>
- Data likely to be a limiting factor in some cases, in other cases may have too many indicators, the core problem being WHICH ones to select.