The Tropics and the Post-2015 Development Agenda: Lessons from the State of the Tropics

Sandra Harding, Professor, Vice Chancellor and President, James Cook University (corresponding author)
vc@jcu.edu.au
(+61) 7 4781 4165
Chancellor (Building 1)
James Cook University
Queensland, Australia 4811
Dennis Trewin, Former Australian Statistician, Dennis Trewin Statistical Consulting
Ann Penny, Project Manager – State of the Tropics, Office of the Vice Chancellor & President, James Cook University
Mark Ziembicki, Senior Research Fellow, James Cook University

ABSTRACT

For a variety of reasons, both imposed from the outside and born from within, development in the Tropics has lagged behind the rest of the world. In many ways, this makes the Tropics more vulnerable than other regions to the world’s grand contemporary challenges. Recognising the unique and shared characteristics of the Tropics the landmark ‘State of the Tropics 2014 Report’ provides the first in-depth, impartial assessment of the Tropics as an environmental and geopolitical entity in its own right. Drawing on the expertise and diverse backgrounds of leading institutions across the region the report offers a new perspective for understanding the diversity of the tropical zone and the nature and implications of the rapid and variable rates of change nations and regions in the Tropics are experiencing. The report demonstrates that tropical nations have made extraordinary progress across a broad range of development indicators in recent years. Indeed, economic growth in the region has accelerated in recent times while it has slowed in the rest of the world.

Despite significant strides forward, the region is at a critical juncture. There are increasing pressures on the environment, poverty remains rife in many regions, and many nations suffer from poor health, education outcomes and governance issues. Rapid population and economic growth mean that the region’s influence is set to rise dramatically. The nature of the region’s growing influence, and its global implications, will depend on how it addresses its many challenges, and whether it realises its potential and opportunities. At a time of great global change, and as the world is set to redefine the global development agenda, it is timely to consider a new geopolitic – one that recognises the critical importance of the Tropics and its key role in the global future.

In this paper we outline the ‘State of the Tropics’ Initiative as a foundation for examining the complex interplay between the various social, economic and environmental factors that ultimately determine human wellbeing, prosperity and the integrity of natural systems in the Tropics. We frame this discussion in light of the UN’s post-2015 Development Agenda and implementation of its Sustainable Development Goals, and conclude with an examination of the role of emergent opportunities, including new technologies and social changes, and their role in driving a sustainable and prosperous future for the Tropics and beyond.
A New Geopolitic

More than 2000 years ago, Aristotle divided the world into three zones – the Frigid Zone, the Temperate Zone and the Torrid Zone (Sanderson 1999). He determined that civilised people could only live and work productively in the temperate part of the world, and that the Frigid Zone was too cold and the Torrid Zone too hot and full of pestilence to be habitable. In recent times, east/west, north/south, developed/developing axes of understanding have dominated our worldview while that fundamental, Aristotelian, lateral perception of the world has faded from view (Harding 2011).

Recent political and economic shifts following the breakdown of the former Soviet Union, and the rise of Asia and the BRICs economies have led to increasingly complex, multilateral perspectives of the geopolitical landscape. Given the rapid population and economic growth of many nations in the Tropics, and the shared issues and distinctive development challenges these regions face (Sachs 2001), it is arguably timely to consider the Tropics as an environmental and geopolitical entity in its own right.

In this paper, we argue for the need to acknowledge the Tropics as a region defined from within by recognising the region's unique shared challenges and opportunities. We outline the State of the Tropics initiative as a foundation for examining the complex interplay between the various social, economic and environmental factors that ultimately determine human wellbeing, prosperity and the integrity of natural systems in the Tropics. We frame this discussion in light of the UN's post-2015 Development Agenda and implementation of its Sustainable Development Goals, and conclude with an examination of the role of emergent opportunities, including new technologies and social changes, and their role in driving a sustainable and prosperous future for the Tropics and beyond.

The Tropical Zone

The Tropical Zone surrounds the equator within the latitudes of the Tropics of Cancer and Capricorn (Figure 1). Although topography and other factors contribute to local climatic variation, tropical regions are typically warm, wet and experience limited seasonal change in day-to-day temperature. Rainfall tends to be highest closest to the equator from where the seasonality of both temperature and rainfall increase with distance (Trewin 2014a).

A defining feature of the Tropics is its extraordinary biological, cultural, and socio-political diversity. Around 80% of the world's biodiversity is found in the tropical zone, most of the world's languages are spoken in a broad area on either side of the Equator, and the region has some of the fastest growing and affluent societies alongside many of the most impoverished and disadvantaged.

The Tropics are presently home to more than 40% of the world's human population, though at current growth rates the population is expected to exceed that of the rest of the world by the middle of the century. By then, the region will also be home to approximately two thirds of the world's children under the age of 15 years (State of the Tropics 2014).

The State of the Tropics Initiative

Recognising the unprecedented changes occurring in the Tropics and the region's
growing influence, an alliance of universities and research institutions with broad expertise and an abiding interest in the Tropics was formed to examine the state of the region. In doing so it aimed to address a nominally simple question: is life in the Tropics improving?

The inaugural State of the Tropics report launched in 2014 is the first major output of this collaboration (State of the Tropics 2014). The report offers a new perspective for understanding the diversity of the tropical zone and the nature and implications of the rapid and variable rates of change nations and regions in the Tropics are experiencing. By examining trends across a broad range of key social, economic and environmental indicators it shines a light on the people and issues of the tropical world.

The State of the Tropics 2014 Report

The State of the Tropics assessment evaluates progress at national, regional and global scales (State of the Tropics 2014). Progress, as defined here, refers to an increase in the sustainable and equitable wellbeing of a society. It is multidimensional and was measured using a broad range of social, economic and environmental indicators. For the purposes of the report these indicators were broadly divided into two inter-related systems; the ecosystem and the human system. The ecosystem is recognised as providing services that underpin all life on Earth. The human system is a subset of the ecosystem, acknowledging that ecosystem health is essential to sustainable development and progress in the human system.

All nations that were entirely within the tropical zone (as defined by the latitudes of the Tropics of Cancer and Capricorn) for which there were adequate data for most indicators were included in the analyses. To aid with analysis and reporting, nations within the tropics were grouped into one of eight regions defined on the basis of general geographical similarities (Figure 1). Analyses and reporting of temporal trends were subsequently based on comparisons of these regional groupings.

Nations that straddle the tropical zone borders were included in the analyses only if the majority of the population (>50%) lived in the tropical zone, or if the proportion of the population living within the tropical zone was 5% or more of the tropical region's population. On this basis a total of 109 nations were included in the assessments, of which eight were considered straddling nations (i.e. Mexico, Brazil, Saudi Arabia, India, Bangladesh, China, Australia and United States).

Data for each of the 52 social, economic and environmental indicators considered were sourced from existing databases from a range of multilateral organisations including the World Bank, UN agencies, IUCN, FAO, and WHO among others (State of the Tropics 2014). Where possible information was sourced for the period from 1950 to 2010. Data were collated for straddling nations at a sub-national level and divided into tropical and non-tropical regions. Where available these sub-national estimates were calculated using finer scale data sourced from within-country jurisdictions, or when not available, by extrapolating from national level data.

Key Findings

The State of the Tropics (2014) assessment demonstrates significant progress across a broad range of social, economic and environmental indicators for most regions. While there are notable differences between regions for many indicators, the report highlights that the Tropics as a whole emerges as a critical global region with a unique set of
development challenges and opportunities.

**Population demographics**

Among the most important statistics to consider in relation to sustainable development in the Tropics relates to human population demographics. Tropical regions generally have higher fertility rates and lower life expectancies than the rest of the world, although there have been notable changes across all tropical regions since 1950 (Figure 2). The tropical zone currently hosts more than 2.8 billion people (approximately 40% of the world's population), and had an average growth rate for the period between 1950-2010 of 2% per annum, significantly higher than the rest of the world at 1.4% per annum. Based on current estimates the population of the Tropics is expected to exceed that of the rest of the world by 2040 (United Nations 2014). Significantly, the Tropics are predicted to be home to two out of every three children under the age of 15 by 2050.

There are also notable differences between regions in population growth and demographics. The greatest growth rates are in tropical Africa where, between now and 2050, 1.8 billion babies will be born, doubling the continent’s population. Nigeria’s population alone is predicted to exceed that of the US, and in Asia, the population of the tropical parts of India will be close to that of the US and Europe combined (United Nations 2014).

**Society & economic growth**

Living standards worldwide have risen dramatically over the last 60 years. The reasons for these improvements are varied and complex and dependent on a combination of social, economic and environmental factors. Economic growth is a useful indicator for improvements in living standards. Nations with strong economic growth are better able to reduce poverty, strengthen political stability, improve quality of environmental protection and lower rates of crime.

The State of the Tropics (2014) assessment found that in 2010 the tropical region on the whole represented only 19% of global economic activity, with GDP per capita estimated at a third of the rest of the world. Significantly, however, the region’s economies are growing quickly compared with the rest of the world. Economic growth in the Tropics outperformed the rest of the world in the 30 years to 2010 by almost 20%, and the region even maintained positive growth throughout the global financial crisis (Figure 3). Across the Tropics, economic progress is uneven with most growth driven by South East Asia and South Asia. These two regions now represent 10.3% of all global economic output. Economic growth rates in Africa and South America have also improved significantly since 2000, influenced by strong demand for commodities, greater political stability and improved governance. Nevertheless, while there have been marked improvements and the proportion of people living in extreme poverty has declined, given population growth the overall number of people living in poverty remains about the same. Most of the world’s poorest nations are located in the Tropics. More than 775 million people live in extreme poverty in the Tropics and an estimated 508 million do not have access to adequate nutrition.

Where and how people are living in the Tropics is also changing. The rate of urbanisation in the Tropics is now faster than in the rest of the world, with almost half the tropical population now living in urban areas. Of those living in cities, 46% live in slums, although the overall proportion of people with access to safe drinking water has increased to more than 80%. Only half of all people in the Tropics, however, have
access to improved sanitation (Figure 4).

Health

The Tropics also bears a disproportionate share of the global burden of many communicable and preventable diseases such as malaria, HIV/AIDS, tuberculosis and dengue (Figure 5). Nevertheless, several health and related social indicators in the Tropics have improved dramatically in recent decades with rates of infectious diseases and maternal and child mortality rates all having declined (Figure 5).

Indicative in part of a rise in living standards in the Tropics is the increased prevalence of non-communicable diseases (NCDs) such as heart disease, stroke, cancer, chronic respiratory diseases and diabetes. Low and middle income nations now bear 80% of the global burden of NCDs, and account for the vast majority of the 36 million deaths from NCDs each year (WHO 2013). Obesity is a key risk factor for NCDs and although it remains much lower than in the rest of the world, is increasing at a faster rate in the Tropics (Figure 5). Many nations now therefore face a double burden of disease whereby the increased prevalence of NCDs adds to existing high rates of infectious diseases and under-nutrition in the Tropics.

Education

Education outcomes across tropical nations have improved but still lag significantly behind the rest of the world. Mean years of schooling of adults almost doubled between 1980 and 2010, but is still 2.5 years less than regions outside of the Tropics (Figure 7). Similarly, youth and adult literacy rates have improved but remain lower than in the rest of the world.

Technology

Over the past 20 years, the mobile phone has emerged as one of the fastest growing consumer technologies every introduced. Around 70% of people in the Tropics now have access to a mobile phone – up from close to zero in 1993. Use of mobile and mobile broadband has leap-frogged fixed line technologies, particularly in underdeveloped regions. Although less than 3% of the tropical population has access to fixed broadband, almost 20% have some internet access. In the absence of broadband infrastructure, access to the Internet is via public access points, such as Internet cafes and through mobile broadband networks.

Creating and using knowledge and innovation is an essential ingredient to human development. In the Tropics, available data suggest that innovation measures are improving. Investment in research and development is increasing modestly; numbers of published science and technical journal articles and enrolments in tertiary education are growing rapidly from a low base. Current estimates show that only 0.6% of tropical GDP is spent on R&D compared with nearly 2% in the rest of the world. Reflecting expenditure, tropical nations account for only 5% of scientific and technical journal articles published worldwide since 1990. Although proportionally, tertiary education enrolments almost doubled in the tropics between 2000 and 2010 they remain much lower than the rest of the world at 2031 per 100,000 people compared with 3423.

Governance
Good governance is fundamental to driving progress towards prosperity and sustainability. Levels of corruption and crime are indicators of how effectively governments function. The *State of the Tropics* report assessed a number of key governance indicators, and found that the Tropics had consistently lower scores than the rest of the world across the three World Governance Indicators considered (control of corruption, rule of law and regulatory quality) (Table 1).

Homicide, though a small proportion of all crimes, is an effective indicator of overall crime rates. In the Tropics, the homicide rate at 14.5 per 100,000 people (around 375,000 murders) is more than double the rest of the world (5.6 per 100,000). South America, Central and Southern Africa, and Central America reported the highest homicide rates at 32.9, 21.6 and 17 per 100,000 people respectively.

**Environment**

The tropical zone is the most biologically diverse region on Earth hosting up to 80% of the planet’s terrestrial biodiversity and over 95% of its coral and mangrove species. Most biodiversity remains to be discovered; only an estimated 10% of species have been described by science. More than a third (35%) of all tropical species that have been assessed according to IUCN Red List criteria are considered threatened. This compares to 20% of species in the rest of the world (Figure 7).

Protected areas are a key tool in helping to conserve biological and cultural diversity. The Tropics have a greater proportion of marine and terrestrial area under protection (15%) than the rest of world (10%). However, effective protection is also reliant on appropriate management of protected areas. In many parts of the Tropics these areas are subject to illegal encroachment and exploitation.

Some ecosystems in the Tropics are more vulnerable than others. Threats to coral reef systems increased markedly between 1998 and 2010 with over half of all the reefs in the Tropics now considered at medium or high risk of damage (Burke et al. 2011). The area of critical mangrove forest has decreased in all tropical regions with some estimates showing losses as high as 35% since 1980 (FAO 2007). Most of the world’s remaining primary forests are tropical (Figure 8). In the ten years to 2010, the FAO reports that the world’s area of primary forest decreased by 42 million hectares with the Tropics (particularly South America and South East Asia) accounting for most loss.

Exploitation of wild marine food resources in the Tropics has increased from 2 million to more than 30 million tonnes in the 60 years to 2010. This increase is driven by greater demand for seafood from a growing and more affluent population coupled with improvements in technology and a more globalised fishing fleet.

**Looking ahead: The Tropics and the Post-2015 Development Agenda**

For a variety of reasons, both imposed from the outside and born from within, development in the Tropics has lagged behind the rest of the world. In many ways, this makes the Tropics more vulnerable than other regions to the world’s grand contemporary challenges. As demonstrated by the *State of the Tropics* assessment, while there have been significant improvements in recent decades across a broad range of indicators, significant challenges remain. There are increasing pressures on the environment, poverty and inequality are major issues in many regions, many nations continue to suffer from poor health and education outcomes, and many countries suffer from poor governance and security issues. Rapid population and economic growth mean
that the region’s influence is set to rise. The nature of this influence, and its global implications, will depend on how it addresses its challenges and whether it realises its potential and opportunities.

**Key Challenges**

*Improve data collection and availability*

Among the key challenges for addressing development issues in the Tropics relates to data availability. The *State of the Tropics* analysis highlights the need for ongoing efforts to collect and make available data from all nations. Of the 134 tropical nations initially considered, 25 were excluded from analyses because of a lack of data availability. Some indicators and some regions were more poorly represented than others. In Oceania, there were adequate data available for only half of the 52 indicators assessed. Only one-third of all nations considered had a complete civil registration system with good attribution of cause of death making it difficult to collate statistics on diseases and other factors causing mortality (WHO 2012). Improving data availability is critical to meeting targets proposed for the Sustainable Development Goals.

*Human capacity to meet distinctively tropical challenges and opportunities*

Another key challenge for development in the Tropics is a lack of capacity and funding. The distinctive development challenges the Tropics face, including issues to do with a high disease burden, unique climate and ecosystems, vulnerability to disaster and a deficit of adequate infrastructure, requires development of skills and expertise across the Tropics. At present, tropical nations account for only a fraction of research and development expenditure, scientific output and tertiary graduates. With the weight of the world population expected to reside in the Tropics, an emphasis on developing human capital in the zone is critical (Trewin 2014b). Expertise and solutions developed in one part of the Tropics can be shared to tackle other ‘tropical issues’ across the region.

*State of the Tropics and the Sustainable Development Goals*

At a time of great global change, and as the world is set to redefine the global development agenda, it is timely to consider a new perspective – one that recognises the critical importance of the Tropics and its key role in the global future (Harding 2011). Since most of the world’s most pressing development needs are largely in the Tropics meeting the Sustainable Development Goals will require a large focus on the nations, people and environments of the Tropics. Recognising that each nation and region of the world faces its own particular challenges to achieve sustainable development is critical. The value of the *State of the Tropics* approach is that it offers a unique and independent perspective on the tropical world. It provides a lens for understanding the diversity of the tropical zone and the nature and implications of the rapid and variable rates of change nations and regions in the Tropics are experiencing, while simultaneously recognising distinctive issues the Tropics on the whole share. The next phase of the *State of the Tropics* initiative will be to consider in detail the relevance and implications of the Sustainable Development Goals and associated targets and indicators in relation to the Tropics.

The State of the Tropics project is ongoing and will continue to provide independent assessments on the progress of the post-2015 development agenda including the sustainable development goals. The next publication will have a focus on sustainable
infrastructure for the Tropics and will lead to the next major State of the Tropics report in 2020. The State of the Tropics project will continue to foster collaborations across the Tropics in order to work towards a prosperous, sustainable and equitable future for the Tropics.

State of the Tropics partners:
James Cook University (Australia), Escuela Superior Politecnica Del Litorial (Ecuador), The National Institute of Amazonian Research (Brazil), Liverpool School of Tropical Medicine (United Kingdom), Organisation for Tropical Studies (Costa Rica & USA), University of Hawaii at Mānoa (USA), University of Nairobi (Kenya), National University of Singapore (Singapore)*, University of Papua New Guinea (Papua New Guinea), University of the South Pacific (Fiji), Mahidol University (Thailand), Nanyang Technological University (Singapore).

*Partners in 2014 report
References


Burke Lauretta, Reytar, Spalding Mark and Perry, Alison (2011) *Reefs at Risk Revisited*. World Resources Institute, Washington.


Trewin, Blair (2014a) The climates of the Tropics and how they are changing in: *State of the Tropics 2014 report*. James Cook University, Australia.


Figure 1: The Tropical Zone bounded by the Tropics of Cancer and Capricorn and regions in the Tropics as defined for purposes of regional analyses in the State of the Tropics 2014 Report (State of the Tropics 2014)
Figure 2: Fertility rate, life expectancy at birth and population of the eight tropical regions (i) 1950 and (ii) 2010 (United Nations 2012)
Figure 3: Economic growth of gross domestic product measured at purchasing price parity in constant 2005 international dollars (World Bank 2013)

Figure 4: Critical infrastructure indicators for the Tropics and the rest of the world in 2010 (State of the Tropics 2014)
Figure 5: Key health trends in the Tropics (green) and the rest of the world (blue) (World Bank 2013).
Figure 6: Adult mean years of schooling in the Tropics and the rest of the world (Barro and Lee, 2010)

Figure 7: Threatened species in the Tropics and the rest of the world (IUCN 2013).
Figure 8: Nations with the largest remaining areas of primary forest in 2010 (tropical nations are shaded green) (FAO 2010).
Table 1: Selected World Governance Indicators. Values range from -2.5 to 2.5 with higher values representing better performance. (World Bank 2013)

<table>
<thead>
<tr>
<th></th>
<th>Control of Corruption</th>
<th>Rule of Law</th>
<th>Regulatory Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tropics</td>
<td>-0.35</td>
<td>-0.41</td>
<td>-0.39</td>
</tr>
<tr>
<td>Rest of the World</td>
<td>0.30</td>
<td>0.33</td>
<td>0.38</td>
</tr>
</tbody>
</table>