ISSN: 1444-8890

ECONOMIC THEORY, APPLICATIONS AND ISSUES

Working Paper No. 58

Economic Challenges Faced by Small Island Economies: An Overview

by

Clem Tisdell

September 2009

THE UNIVERSITY OF QUEENSLAND

ISSN 1444-8890

ECONOMIC THEORY, APPLICATIONS AND ISSUES

(Working Paper)

Working Paper No. 58

Economic Challenges Faced by Small Island Economies: An Overview[1]

by

Clem Tisdell[2]

September 2009

[1] This is the draft of an article for inclusion in Öner Günçavdi (ed) *The Challenge of EU Enlargement: Northern Cyprus – Understanding a Small Island Economy in Isolation* Nova Science Publishers, New York.

[2] School of Economics, The University of Queensland, St. Lucia Campus, Brisbane QLD 4072, Australia
Email: c.tisdell@economics.uq.edu.au

`

WORKING PAPERS IN THE SERIES, *Economic Theory, Applications and Issues,* are published by the School of Economics, University of Queensland, 4072, Australia.

For more information write to Professor Clem Tisdell, School of Economics, University of Queensland, St. Lucia Campus, Brisbane 4072, Australia or email c.tisdell@economics.uq.edu.au

Economic Challenges Faced by Small Island Economies: An Overview

ABSTRACT

As pointed out in this article, small island economies are diverse in their nature and in the challenges they face. A taxonomy of these economies is provided. The overview takes account of small island economies that are satellites of large countries as well as those which are independent nation states. Nevertheless, the emphasis here is on small island economies that are remote from central economies or disadvantaged in other ways. These include many island nations in the Pacific and elsewhere. Such economies suffer from diseconomies of scale in economic activity, are prone to imperfect market competition, and experience high transport and trading costs for a variety of reasons which are outlined. The gravitational pull of stronger central economies and central places favours net out migration from these economies, particularly a brain drain, as well as net private capital outflows. These tendencies often stifle local economic development. Such economies frequently depend on aid from foreign or overseas places for maintaining the levels of income of their inhabitants; income levels which in many cases are relatively low. Income levels may be precarious in such economies because they are vulnerable to variations in economic, natural and political forces. They usually lack diversity in their natural resources and in their exports. A natural disaster can devastate their whole island economy so that little resilience remains to deal with the disaster by relying on the island's own resources. Whether or not such economies are particularly prone to political disturbances is unclear, but when such disturbances occur they tend to impoverish those areas because net migration and net capital outflows increase and inbound tourism (which is often an important source of income for such economies) dwindles. The environmental situation facing small island economies varies. Some have undergone rapid urbanisation and centralization of their populations and this has caused significant pollution problems and water availability problems. Furthermore, some are at considerable risk from climate change. Using mathematical relationships, it is demonstrated that small island nations will lose (on average) proportionately more of their land mass as a result of sea-level rises than larger nations. Increased urbanisation of such economies usually increases their economic vulnerability because it is normally associated with greater dependence on international market exchange and results in increasing urban-bias in politics.

Economic Challenges Faced by Small Island Economies: An Overview

1. Introduction

Depending upon how one determines the degree of smallness of economies and the way in which they should be distinguished from larger economies, the number of small island economies is very large. They are also extremely diverse in their relative sizes, geographical nature and arrangements for their governance but nevertheless, at the same time, have some common economic and related challenges. For example, the sustainability of their economic performance is highly vulnerable to changed economic or environmental forces over which they have limited control. As well, they usually have little capacity and few options to cope with the difficulties caused by such changes. On the other hand, their capacity and options to cope with variations in their circumstances differ a lot. For example, these can vary with the extent to which they have sympathetic connections with larger countries or territories, for instance, whether or not they are independent nations or are political dependants of larger nations.

In order to highlight the diverse nature of small island economies, consideration is given to some of the factors that should be taken into account in classifying them. In most small island economies, there are concerns about international labour and capital mobility. The options for this mobility and the economic impacts of such movements are examined paying some attention to particular issues, such as those concerning Cyprus and some small island economies in the Pacific Ocean. Partial neoclassical economic analysis, does not take adequate account of total global changes that can occur in the economic fortunes of small island economies as a result of labour movements abroad and capital outflows, for example, changes in economies or diseconomies that may result from variations in the extent of their local economic activity and alterations in their levels of population. These aspects together with other issues involving demographic changes are considered. Attention is given to economic vulnerability and sustainability challenges faced by economies as well as relevant environmental issues.

2. Towards a Taxonomy of Small Island Economies

To identify and classify small island economies is not as straightforward because what is regarded as small is qualitative and comparative, and is determined by convention. For example, Australia is sometimes regarded as the world's largest island or its smallest continent. However, nobody would doubt that Nauru in the Pacific Ocean is a small island. Furthermore, there is also the question of how an island economy is to be identified. What constitutes the borders between one economy and another? These boundaries vary with the passing of time and have become more permeable as globalisation has proceeded. There is the further problem that 'economies' are not by any means congruent with the jurisdiction of national states. For example, a micro-state could have within it some relatively separate economic systems, e.g. the smallest islands of Kiribati, or some micro-states can be appropriately considered as a part of a larger economy involving a larger state or economic grouping e.g. consider the case of Hong Kong. It should also be noted that some small regions that are not islands often have similar economic attributes to those of small island economics.

There are many different attributes that influence the economic performance and challenges facing small island economies. These include their spatial characteristics, their topography and geographical dimensions and their political arrangements and lack of economic competition in their home markets. Let us consider each of these briefly in turn.

2.1 Spatial characteristics

The spatial characteristics of small island economies that can be important are their distance from larger economies and whether or not they consist of many small scattered inhabited islands. If they are close to larger economies (as are Singapore and Hong Kong) or international trade routes (as both these island economies are), their economic connectivity with larger regions is likely to be high because the cost of their international trading will tend to be lower than small island economies that are far away from large markets and not on international trade routes or well located in relation to these. This is true for example of Samoa and Tonga in the Pacific Ocean. It is a particular problem for micro-states such as Kiribati and Tuvalu.

These latter countries suffer from an additional problem because their small land mass is distributed over several small islands which are located great distances from one another. This impedes inter-island trade and adds to the cost of providing some utilities and infrastructure. For example, if electricity is produced on several islands using fossil fuels, the cost per-unit of electricity supplies will be higher than if the same amount of electricity could be produced at one point and supplied to users. This is because decreasing costs of production are significant in the generation of electricity using fossil fuels. The cost of supplying non-tradable commodities tends to be higher when the population of small states exhibit greater spatial dispersion. There are often economies of scale in supplying these commodities.

The high cost of inter-island transport and the low frequency of such transport connections add to the cost of inter-island trade. Consequently, already small markets are fragmented and made even smaller. It is difficult to extend markets in such circumstances and obtain the type of economic advantages that Adam Smith (1910) argued could be reaped from the extension of markets.

2.2 Topography and geographical features

Small islands and small island nations differ considerably in their topography and geophysical features. Some consist of coral atolls (such as the Maldives), some are of volcanic origin (e.g. Samoa and the Hawaiian Islands) and others are derived from sedimentary and other materials from larger land masses. The island status of this latter group can in some cases be attributed to sea level rises or to the slow drift of land masses as in the case of parts of New Caledonia. Depending on the landforms of small islands, the possibilities for land-based primary industries vary. For example, coral atolls have little potential for agriculture but many soils derived from volcanic sources when watered are very productive when used for agriculture.

The main economic resources of micro-states which consist of several atolls or which include many atolls (some micro-states contain a mixture of coral atolls, volcanic islands and islands of continental origin, for instance, New Caledonia) or otherwise of many small islands are their marine resources. Under the United Nations Convention on the Law of the Sea (UNICLOS), nations have a marine economic exclusion zone extending out to 200 nautical miles from their land-masses. The geometrical

consequence of this is that the marine area controlled by many small island states is very high in relation to their terrestrial area and proportionately much larger than in the case of larger non-island states.

2.3 Political arrangements

The political arrangements and international political connections of small island economies both currently and in the past have a major influences on their economic fortunes. French overseas territories, for example, continue to receive considerable economic aid from mainland France and small island economies politically associated with the United States (such as Federated States of Micronesia and the Marshall Islands) receive economic support from it. Australia and New Zealand provide aid to several small island nations in the Pacific. This is influenced by their relative proximity and earlier affinities established as a result originally of the British Empires and subsequently the British Commonwealth. Again, for example, the current economic situation of Cyprus can only be understood by taking into account its division and the consequences for it of Turkish and Greek history and the interactions of these nations.

Political arrangements and the historical patterns of political developments in small island nations, particularly in relation to other nations, affects their economic aid from overseas sources, their patterns of international trade, the migration patterns and possibilities of their citizens, and the direction of their capital movements internationally. Cultural affinity is important in this regard.

A further point to note is that the boundaries of small island economies are usually discussed in the literature as coinciding with those of national states or similar political territories. However, as mentioned above, political and economic borders can differ to some extent. The nature of the latter aspect is little explored because available statistics are usually collected so that they coincide with politically determined territories. Nevertheless, it could be argued that focussing on national states is appropriate because policies are determined within their borders.

2.4 Lack of competition in home markets of small island communities

Because markets in island communities tend to be small, they are prone to a lack of market competition in traded commodities. Imperfect competition is more prevalent than in larger economies. Economies of scale combined with small markets restrict the number of their traders in many industries. Industries affected include international and inter-island transportation, some services (such as banking) and some types of retailing and electricity supplies. In addition, there may be limited competition in purchasing of products for export by middlemen.

Not only is imperfect competition likely to be widespread in small island economies, it is a chronic problem. It cannot normally be removed by adopting competitive policies that would be effective in large economies. This is because large numbers of firms in individual industries are likely to be uneconomic in such economies due to scale economies. Therefore, compared to the situation in large economies, there is a need to resort more often to regulation in order to control profiteering by firms in small island economies operating in a non-competitive environment. However, the political will to do this may be limited by personal connections of business owners and managers with politicians in such economies and the weak bargaining power of small island governments in relation to multinational companies if these operate in their countries.

3. Transboundary Movements of Labour and Capital – Initial Observations

3.1 Initial observations

Often residents of small island nations have economic concerns about international labour movements. Some are concerned about inflows of labour to their country and others about outflows and in some cases, both of these aspects create anxieties. These complex issues are discussed below and inflows and outflows of capital from small island nations are given some consideration.

3.2 Overseas labour movements

When incomes in an island economy are higher than in other economies this is likely to result in labour inflows to the island economy. If the traditional neoclassical theory of labour markets applies this inflow will tend to lower wage rates in the island

economy and be opposed by workers in that economy. This may be one of the reasons why the People's Republic of China has restricted the movement of labour from mainland China to Hong Kong. Similarly, Singapore restricts inflows of labour from neighbouring Malaysia and from abroad generally. There are also some limitations on inflows of workers from Turkey to North Cyprus.

Nevertheless, it should be kept in mind that labour markets are not homogenous, and inflows of some types of skilled labour and personnel are welcomed by residents of small island economies, or at least favoured by the governments of small island nations. For example, incoming personnel may be able to provide skills not otherwise available in the small economy and their contribution may add to local employment and incomes. This may be true, for instance, of some positions in the tourist industry. However, the downside of this dependence on skilled external labour may be a subsequent failure to train locals to carry out the type of work involved even when this is a practical option. Furthermore, in some instances, small island economies welcome inflows of skilled personnel to help compensate for loss of their own skilled personnel due to overseas migration. For example, there appears to have been a net outflow of medical practitioners from several Pacific island nations to higher income countries. To compensate for this, medical practitioners have been recruited from some African countries. Presumably, the medical practitioners from such countries have fewer opportunities to migrate overseas than those from Pacific island nations.

The outflow of medical practitioners and other providing personal services in high demand by residents of small island nations creates concerns for their residents. In general, it is easier for skilled persons to migrate internationally than it is for those that are unskilled. The result is that small island nations tend to suffer a net 'brain drain' (McKee and Tisdell 1990, Ch.8) if incomes in these countries are significantly below those in other countries or regions to which migration is an option.

On the other hand, residents of small island economies usually welcome opportunities for their citizens to obtain employment outside their territory. On many small islands (for example in the Pacific), employment opportunities for cash income are very limited and higher incomes can be obtained overseas. Therefore, economic advantages can be obtained by locals from external employment, particularly by

persons who are unskilled or who have skills in limited demand in their home economy. There are economic advantages to those who obtain employment offshore, and their relatives remaining back home gain as a result of their remittances.

Different types of labour outflows occur. In some cases, the labour movement is associated with permanent migration of family members, in other cases with temporary residence abroad, and in some instances, involves commuting. The latter is only practical when the external labour market is in close proximity to the island economy. The latter occurs for some personnel in the case of Hong Kong, and from North to South Cyprus but is impractical for Pacific island territories that are far distant from potential external labour markets. For them, permanent migration and temporary employment abroad are the main options for their employment overseas. A third and more specific option (which has been pursued by Tuvalu and Kiribati) is to obtain employment for some of the residents of micro-states as merchant seamen employed by foreign shipping lines. Both countries have colleges that specialize in such training. However, their residents face strong competition from several developing countries (for example, Pakistan and the Philippines) in this international labour market.

The previous and continuing political affiliations of some Polynesian islands with New Zealand give their residents the opportunity of permanent migration to New Zealand. A similar situation prevails in relation to island territories associated with the United States, and for some French territories. Opportunities also exist for some Pacific islanders from selected nations to be employed as guest workers (for instance, on a seasonal basis) in New Zealand and in Australia. Such opportunities are particularly welcomed by the residents of small island Pacific nations that have extremely limited opportunities for overseas migration, for instance those from Kiribati and Tuvalu. Those residents who obtain external employment earn higher incomes than at home and their relatives remaining at home gain as a result of their remittances. However, the selection of small island nations for participation in these schemes seems (for instance in Australia's case) to be based primarily on political rather than economic considerations.

Mehmet et al. (2007)have used neoclassical economic models to analyse the operation of labour markets in Cyprus. Cyprus is unusual in that it is a relatively small island that is divided politically and North Cyprus has been disadvantaged by international economic trade sanctions (Eichengreen, Faini and Wyplocz 2004, Günçavdi and Küçükçifi 2008). This has contributed to incomes being lower in North Cyprus than in South Cyprus. Thus, an already small island economy has been divided effectively into two smaller island economies because the economic overlap of the two economies has been reduced by political factors. There are also some other island economies that are divided politically, for example, West Samoa and American Samoa in the Pacific, and the Dominican Republic and Haiti in the Caribbean. Each of these appears to have its own idiosyncrasies.

Using their analysis, Mehmet et al. (2007) demonstrate the presence of a tendency towards wage parity between South and North Cyprus due to North Cypriots travelling to South Cyprus to obtain work. Despite this tendency, they argue that wage disparity continues with wages being higher for South Cypriots than for North Cypriots working in South Cyprus because of various forms of discrimination in the employment of North Cypriots in South Cyprus. Clearly labour markets on Cyprus are complex. Furthermore, the North Cypriot labour market is influenced by inflows of Turkish workers to North Cyprus. This supply is likely to restrain wage rises in North Cyprus. On the other side, South Cyprus is a part of the EU and consequently, South Cypriots, have labour mobility within the EU. Hence, one would expect on the basis of neoclassical economic analysis that this would be a factor contributing to higher wages in South Cyprus than North Cyprus. The Cypriot case underlines the diversity of economic situations faced by small island economies.

Should North Cyprus obtain entry into the EU this should increase the migration possibilities available to North Cypriots. Nevertheless, some wage disparities between North and South Cypriots may continue to exist due to discrimination. It is also possible that some discrimination against Cypriots could occur in other parts of the EU.

While partial neoclassical models of labour markets have some value for analysing labour markets in small island economies, they have limitations when the economic

consequences of large aggregate movements of labour occur involving migration. Such movements affect the size of the home market of island economies. They **may** result in the loss of industrial external economies and increased costs of supplies from industries and activities that experience internal economies of scale if the size of the home market is reduced. This aspect is discussed below.

3.3 Transboundary capital movements

Most small island nations have a financial deficit in their international trading of goods and services and this is financed by foreign aid and remittances from their citizens or former citizens who have found work abroad. Brown (2008)and Brown and Jiminez (2008) have, for example, demonstrated the economic importance of remittances in the case of Fiji and Tonga. Günçavdi and Küçükçifi (2008) highlight the important economic role that aid from Turkey has played in helping to maintain incomes in North Cyprus.

Most small economies rely on foreign aid as a contributor to their development and a source of foreign funds to help finance their imports. Nevertheless, the importance of overseas economic assistance as a contributor to the well-being of the residents of small island economies varies greatly. It is reported to be quite high (for example, for French overseas territories) but is limited for some small island economies that are politically independent, such as Nauru. Furthermore, some island nations, such as Singapore, do not rely on foreign aid at all.

I have argued elsewhere (Tisdell 2007) that (despite exceptions) there is a tendency for investible funds to flow out of many small island economies and that the outflow is likely to exceed the inflow of investible funds. This applies to funds on which investors want to maximize their returns and occurs because the scope for productive investments in many small island economies is very limited. In making such decisions, residents will take account of comparative risks. Even some governments invest the bulk of their investible funds abroad, as in the case of Kiribati and Tuvalu. This is likely to be rational given the limited opportunities for productive investment at home. However, it does expose the public finances of such micro-states to the vagaries of global financial markets, such as the economic recession that was evident in 2008 and which continued in 2009.

Nevertheless, in accordance with my view that the economic and financial situations of small island economies are diverse, there are some small island economies that have a positive net inflow of net investible funds, the direction of which is determined by market forces. This is the case for Singapore and Hong Kong. However, at the same time, their inflow of investible funds is sensitive to external economic conditions and confidence in the global financial system. Consequently, Singapore's economic activity was adversely affected by the global economic recession of 2008-2009. To some extent, Hong Kong has been shielded from the global recession by its close association with mainland China which has weathered the global economic storm better than most nations (Tisdell 2009). Furthermore, many small economies are subject to economic contagion of global economic recessions in other ways considered below. As discussed later, a characteristic of all small island economies is their economic vulnerability.

4. Demographic Issues, Market Size and Market Fragmentation

4.1 MIRAB modeling and changes in its variables

In the 1980s, Bertram and Watters (1986, 1985) and Bertram (1986) put forward the view that most South Pacific island microstates can be modelled as MIRAB economies, that is ones in which migration, remittances from migrants, overseas aid and the government bureaucracy play a central economic role. It was argued that foreign aid is mostly used to create employment (for cash income) in the public service and (cash) remittances are sent by migrants to their families. Subsistence activities are substantial in these economies and government employment and remittances are the main avenues open to their residents to obtain cash income (Tisdell 2007). To varying degrees, this model may also apply to some island economies outside the South Pacific. However, the situation is not static.

In recent years there has been a tendency for overseas donors to reduce their aid to developing island states. This seems to have had two consequences. It has provided greater motivation for migration by residents of these states as opportunities for employment in the public service have declined. Secondly, it has resulted in governments in these microstates searching for new sources of cash revenue. Many have introduced value added taxes or taxes on sales (involving monetary transactions)

for this purpose. These taxes, together with import duties, enable the governments of microstates to appropriate a portion of the cash remittances of migrants when they are spent by resident recipients of these remittances.

The main source of cash income for many families in small Pacific island economies is from remittances from their relatives abroad or from family members that have been able to find employment in the public service or in some cases, employment in the private sector for cash incomes. The importance of the latter varies with the economic structure of microstates. It is, for example, more important in Fiji and Mauritius (both of which have international tourism and some manufacturing industry) but is of negligible importance in microstates such as Kiribati and Tuvalu. Furthermore, to some extent, (and increasingly so for economies that are smaller and more isolated), private economic activity involving the use of cash relies indirectly on public expenditure. For example, the incomes of public servants results in expenditure on goods and services and a multiplier effect on incomes and expenditure of cash in the private sector.

4.2 External migration, overseas aid and market size

Emigration is an attractive possibility for residents of many island economies. Migration often results in greater income and extra opportunities for paid employment of migrants. Nevertheless, the question arises of whether such migration has favourable economic consequences for the country from which the emigration has occurred. Does it, for example, increase or decrease the size of the market available to the nation experiencing a reduction in its level of population? The answer to this question is complex.

One possibility is that as a result of remittances from emigrants that the incomes of those families remaining on an island nation could increase. It is even possible that their aggregate income of microstate could rise as a result of remittances. This may raise demand for locally produced commodities. However much of this extra income may also be lost in import leakages, that is, spent on imported commodities. Therefore, while the size of the home market of a microstate may rise as a result of emigration and remittances, this is not certain to occur. Case studies are needed to determine the relative importance of these factors.

Most likely a moderate level of emigration from island economies will result in a rise in the aggregate income of the remaining population after remittances are taken into account but if a much larger level of emigration occurs, depopulation is likely to result in a fall in their aggregate income. Furthermore, if the size of the home market declines, loss of economies of scale in industries and sectors where scale economies are important is likely to add to the economic burdens experienced by residents remaining in microstates. Economies of scale are likely to be important in the supply of utilities, in transport and in public (government) services.

An additional consideration is that up to a point, migration from small island economies increases the demand for their exports. Migrants often have a demand for 'speciality' items from their home country. For example, Samoan migrants like to buy Samoan chocolate (produced from cocoa grown in Samoa) and some Pacific islanders abroad have a demand for the intoxicating drink kava, produced in their homelands.

An interesting question is the extent to which donor countries should allow greater immigration from microstates in view of the fact that this is likely to reduce their need to provide direct aid to microstates. There has been little study of this issue but it was discussed in Tisdell (1990Ch.10). It is, however, pertinent to note that immigration decisions made by governments are not purely based on economic considerations but are greatly influenced by social concerns and policies governing international relations such as the desire to keep some small island communities in existence for security reasons.

4.3 Internal migration

In those small island nations consisting of a number of small islands (archipelagos), there has been a strong tendency for residents to migrate to the central island where the seat of government is located. This was, for example, noted by Connell (1986) and this migration pattern has continued.

There are probably several reasons for this. These include greater availability of jobs paying monetary wages, for example, in the public service, better public infrastructure, more frequent transport services and lower prices for many goods in central places. Centre-periphery phenomena seem to influence this migration (Tisdell 1990Chapter

9). As the outer islands become increasingly depopulated, economic and social conditions in these islands tend to deteriorate thereby, reinforcing the tendency to migrate to a central place in an island nation. As discussed later, this pattern of natural migration can generate serious environmental problems on the island containing the central place.

5. The Economic Vulnerability and Sustainability of Small Island Nations.

Small island nations tend to be economically much more vulnerable than large nations and their economies are at greater risk of not being able to sustain economic growth or even their level of economic activity. Let us examine each of these aspects in turn.

5.1 Economic vulnerability

Large economies usually have a greater amount of resources spread over a wider geographical area than small island nations and their resources tend to be more diverse because of their size. This increases the ability of large economies to respond to natural disasters and changes in their economic environment compared to small island nations. The resources of larger nations tend to be more diverse than those of smaller nations and consequently, this gives larger nations greater scope (flexibility) for adjusting to changing circumstances over which they have little control.

Because of their limited amount and low diversity of resources, the variety of products which small nations can produce domestically are usually more restricted than in large nations. Therefore, when they rely on home production, the variety of commodities available to the residents of small nations is very restricted compared to that able to be produced in most large nations. A country such as Australia can, for example, produce virtually all types of agricultural produce because it has tropical, subtropical and temperate zones but virtually all small economies are located in one climatic zone. For example, the Seychelles and the Maldives are located in the tropics as are most of the Caribbean island nations. Malta and Cyprus (in the Mediterranean Sea) have a temperate climate.

Lack of product diversity adds to the economic vulnerability of small nations. Their loss in domestic income and consumption is likely to be high when one of their products fails to yield as well as in the past because other domestic products cannot be

easily substituted for it. A further consequence of the geographical situation of small nations is that the variety of products that they are able to export is restricted. They have a narrow range of exportable products and often the destinations to which they export are limited. This adds even further to their economic vulnerability. If the export demand for one of their products declines, small island nations find it difficult to compensate for this by increasing their export of other products and a decline in the export demand for one of their products is likely to result in a large percentage reduction in their export income. This does not occur in the case of large nations because they usually rely on many different types of exports for their export income and have more scope to export alternative products.

Small islands often rely heavily for their overseas earnings on industries that show considerable volatility in demand for their commodities. Tourism, for example, is one such industry. Demand for tourism tends to be very income elastic and subject to fluctuations. For example, the current global recession (2008-2009) has slashed demand for overseas travel. Tourism demand is also vulnerable to factors such as attacks by terrorists, disease outbreaks, political and civil disturbances and so on. Even the demand for able seamen can be variable. As pointed out above, some small Pacific nations specialize in supplying seamen for the international merchant fleet. The world recession (2008-2009) saw a reduction in demand for shipping services and a lowered demand for able seaman, thereby reducing this source of income for countries such as Kiribati and Tuvalu.

In many Pacific island nations, residents depend heavily on subsistence incomes provided by local supplies (Tisdell 2007). While this shields their residents from the vagaries of economic fluctuations in export incomes, it increases their economic exposure to variations in local ecological and environmental conditions that cause instability of yields. These include events such as the occurrence of drought, storms and cyclonic activity and agricultural pests and fluctuations in fish stocks where fish are an important part of the local diet. Because of the lack of variety of locally produced commodities, island residents have a strong propensity to import. Hence, there is a strong tendency for their balance of payments to be in deficit and for their international reserves to be low. This adds to their economic vulnerability and like many developing countries, they run the risk of being burdened by international debt.

5.2 Economic sustainability

Most small island nations need to give particular attention to the sustainability of their economic activity. This is especially true of those that rely heavily on their natural resource-base for the sustainability of their economic activity. The reliance of such countries on the mining of non-renewable resources is not sustainable as was dramatically shown by the mining of phosphate in Nauru and other Pacific island countries (Tisdell and Fairbairn 1984). Furthermore, in the case of Nauru, the investment of its funds obtained from mining failed to maintain their capital values and level of returns. This led to the subsequent impoverishment of Nauru after mining stopped.

Even in the case of renewable resources considerable care is needed to avoid lack of economic sustainability. If over exploited or if habitat is destroyed as, for example, in the case of fishing, yields of fish fall and in extreme cases, can cease. Even in agriculture, yields can fall if care is not taken to conserve the soil and other natural resources on which agriculture depends. Prasad and Tisdell (2006) have argued that this is a significant problem in Fiji.

The tourism industry on which many small island nations are heavily reliant for income is also subject to long-term economic sustainability challenges. If the natural (and cultural) resources that attract resources to most small island countries are destroyed or reduced in their quality, this will result in a fall in visitor numbers or their length of stay. Furthermore, deterioration in infrastructure used by tourists can result in reduced demand for visits by tourists. There are risks of tourist cycles of the type identified by Butler (1980) and discussed by Tisdell (2005, Ch. 10).

Some of the endogenous economic sustainability problems facing small island nations have, for example, been discussed by Tisdell and Fairbairn (1984) from a theoretical perspective. However, additional economic sustainability problems arising from environmental change are faced by most small island nations and many of these problems are not of their own making, although some are.

6. Environmental Problems Threatening the Well-being of the Residents of Small Island Nations

Some of the environmental problems threatening the well-being of the residents of small island nations are beyond their control but others are a consequence of their own actions. Let us consider some of these environmental problems by focusing on each category in turn.

6.1 Environmental problems beyond the control of small island nations

One of the most important environmental issues facing small island nations at present is global warming and its consequences. Global warming is an environmental problem over which small island economies have virtually no control. It is expected that small island economies will experience a greater frequency of hazardous weather events such as storms and cyclones, greater tidal surges and swells and sea-level rises as a result of global warming. This will result in their increased erosion by the sea and greater inundation of their coastal areas. In fact, some low-lying island nations (such as the Maldives and Tuvalu) may disappear altogether. The consequences of these events are discussed for instance in Tisdell (2008b).

Much has been made of the fact that some island nations will be completely submerged by sea-level rises. This is admittedly a serious likely consequence of global warming. However, what seems to be less well known is that on average small island nations can expect to have a higher **proportion** of their land mass eradicated by rising sea levels than large countries given similar coastal gradients of their land masses. This is because of the nature of the mathematical relationship between the length of the circumferences of terrestrial area of a nation and the area of its land. This is easily illustrated, for example, if the land mass of island nations are assumed to be square.

In this case, let x represent the length of the border of a nation on one side. Then its total coastal border (perimeter) has a length of $4x$ and the area of its land is x^2. Hence, the area of its land relative to the length of its land borders is

$$y=x^2/4x=0.25x \qquad (1)$$

This means that as the borders of an island increase, its area rises but by proportionately less than the rise in its coastal perimeter. The increase of this relationship is

$$y^{-1}=4x/x^2=4x \qquad (2)$$

These relationships are illustrated in Table 1. From this table, it can be seen that as the size of a country increases, its coastal border relative to its land area declines (see Row 2). From Row 1, it is observed that a as the size of the hypothetical country increases, its land area relative to the length of its coastal border rises.

Table 1: A mathematical illustration that the coastline of smaller island nations tends to be larger relative to their land mass than for larger islands. This assumes countries of a square shape but the relationship is relatively general.

Variable	**Value of x; the length of one side of the border**				
	1	2	3	4	5
Nation's land area relative to the length of its coast $x^2/4x$	1/4 1/4	4/8 1/2	9/12 3/4	16/16 1	25/20 1.2
Coastal border relative to land area $4x/x^2$	4	1	1.33	1	0.8

This general type of relationship applies to other shapes of land masses if they are increased in size while preserving their shape. While nations differ in their shapes, the general observation is still relevant. Also the more the land mass of an island nation is segmented into separate islands, the greater tends to be the land mass it loses (relative to its total land area) for a given rise in sea levels, other things being held constant.

There are other environmental changes that can seriously impact on small island nations and over which they have no control. Some small island countries are prone to volcanic eruptions and to tectonic movements in the Earth. As a result of such influences, islands can rise from the sea or disappear. For instance, islands constituting the Galapagos Islands emerge from the sea, slowly drift and in the very long term, are expected to become submerged once again in the ocean.

6.2 Environmental problems attributable to human actions within small island nations themselves

Many small island nations have environmental problems that arise from the activities of their own residents. Several experience significant pollution problems.

Water pollution as well as water shortages are serious problems in some island nations. For example, some small island nations rely on underground water bores for their freshwater supplies. If these water supplies are used at too fast a rate, their freshwater is replaced by saltwater from the sea and the water becomes unsuitable for drinking. This has happened on Tarawa, the capital of Kiribati. The situation is made even more difficult by the migration of islanders from outer islands to central places such as Tarawa. This process adds greatly to the environmental problems of many small island countries. This is because they do not have the space and ecosystems that can provide adequate systems to help dispose of waste.

In the crowded conditions which develop risks increase of groundwater being polluted, disposal of sewage becomes a problem and solid wastes tend to accumulate. *E coli* counts can become high in lagoons or relatively still waters in island communities where these are present. Solid wastes (usually from imported goods) create problems because there are no recycling facilities in most small island countries and space for dumping solid waste is limited. Much of such waste finds its way into the sea. In some cases, plastic containers and bags are quite visible and often accumulate on foreshores, as on the shore of the bay near Suva, Fiji. This can have an adverse impact on marine life and is looked on negatively by international visitors, including tourists. By contrast, Singapore is disposing of its solid wastes on a small offshore island which is growing in size as a result. Singapore's authorities claim that disposal is so well managed that it is adding to biodiversity on this island.

Many small island economies also have to wrestle with the potential negative environmental consequences of international tourism itself. Often tourist developments and tourists destroy the types of landscapes that attract foreign tourists. Foreign tourists can add significantly to the generation of wastes and cause a surge in the demand for freshwater.

The residents of small island nations are responsible for many of the pollution and the environmental sustainability problems they experience. However, because they are small and have limited resources, and, in many cases, their residents are relatively poor, it is difficult for them to address these problems. In particular, most are ill equipped to cope with increased urbanization and the rapid growth of their main settlements.

7. Concluding Remarks

This article has stressed the fact that small island economies are very diverse in their spatial location, geography, and political arrangements and connections. All these factors influence the nature of their economic operations. Improved classification of such economies could help us to better understand the varied economic challenges they face. Most small island economies appear to have limited market competition at home and their transboundary movements of labour and capital assume much greater economic importance than in large economies.

Particularly for small island economies that are not close to larger economies (and are not in effect be appendages to these), migration, remittances overseas, aid and employment in the government bureaucracy play a central role in their economic operations. In recent times, there has been a tendency to reduce overseas aid to microstates. This has increased the importance of migration and remittances as factors affecting the welfare of residents of small island economies.

Because of their small home market, many small island economies experience diseconomies of scale in the supply of their goods and services. The question was raised of whether migration adds to these diseconomies or ameliorates them as a result of remittances raising the income-levels of residents remaining on islands. Another issue is the possibility that donors of aid to small island nations can substitute easier immigration from microstates and reduce their need to provide to such states with direct aid.

Internal migration within many small island nations poses problems for their economic development. These include the de-development of outer areas and their

depopulation and the occurrence of serious pollution problems in central places as well as water shortages in such areas.

It was also argued that all small island economies have a higher degree of economic vulnerability and face more serious economic sustainability problems than large economies. These difficulties are compounded by their environmental problems. Some of these problems, such as global warming, are beyond their own control. Their land area is at great risk of being reduced as a result of global warming and it was argued that small islands will suffer relatively greater land loss on average as a result of sea-level rises than larger land masses. As is well known, some island nations are likely to be completely submerged by sea-level rises. However, not all the environmental problems experienced by small island nations are a consequence of the activities of larger nations. Many of their actual and emerging pollution problems are a consequence of their own activities. Given the difficult economic situation of most small island nations, the limited capacities of their environments to neutralize wastes, and the virtual absence of recycling facilities in most instances in small island economies, it is more difficult for small island nations to address such problems than larger nations. We can safely conclude that small island nations (as a whole) face more difficult economic and environmental problems than those of large nations.

The population in small island economies is becoming increasingly more urbanized and their population is gravitating towards their largest population centres. Consequently, this may result in policies that involve urban bias. The earning of extra monetary income from international market exchange and remittances is likely to be encouraged. For one thing as a result of greater tax payments this adds to the income available to the government bureaucracy. Therefore, such a development is likely to be favoured by government policy-makers. Public bureaucrats are likely to favour economic developments that add to tax revenue and assist their employment and power. Town-dwellers who are unable to find paid employment locally or much paid work are likely to be more dependent on remittances than rural dwellers for their livelihood because rural residents find it easier to obtain subsistence income. As a result increasing external economic dependence of small island economies can make them even more vulnerable to external economic events than in the past. Structural change influences political decision-making and alters the personal economic needs of

their residents in ways that can increase the economic vulnerability of small island nations and even endanger their economic sustainability.

If North Cyprus is admitted to the EU, this is likely to increase the wages of North Cypriots but at the same time, it can be expected to stimulate emigration. If its population outflow is moderate, the size of its home market may increase as a result of higher wages and an increase in remittances but if its exit of population turns out to be high, the size of the market in North Cyprus could decline. This is consistent with a theoretical possibility raised above. It could, therefore, become a region that declines in economic size and this may have some negative economic consequences for its remaining residents. Consequently, it is not certain that the admission of North Cyprus to the EU will stimulate economic growth and development of North Cyprus. This is not inconsistent with the possibility that after admission to the EU, the per capita income of its remaining population will increase. These income increases are likely mainly to be a result of a greater volume of remittances due to increased emigration from North Cyprus.

8. References

Bertram, I. G. (1986). Sustainable development in Pacific micro-economies. *World Development*:14:497-519

Bertram, I. G. and Watters, R. F. (1986). The MIRAB process: some earlier analysis in context. *Pacific Viewpoint*:27:47-59

Bertram, I. G., and Watters, R.F. (1985). The MIRAB economy in South Pacific microstates. *Pacific Viewpoint*:26:297-519

Brown, R. (2008). *Remittances and development in the Pacific: Effects on human development in Fiji and Tonga.* Paper presented at the United Nations Export Group Meeting on International Migration and Development in Asia and the Pacific, Bangkok, 20-21 September.

Brown, R. and Jiminez, E. (2008). Estimating the net effects of migration and remittances on poverty and inequality: Comparison of Fiji and Tonga. *Journal of International Development*:20:547-571

Butler, R. W. (1980). The concept of the tourist area cycle of evolution: Implications for management of reserves. *Canadian Geographer*:24:5-12

Connell, J. (1986). Population, migration and problems of atoll development in the South Pacific. *Pacific Studies*:9:(2):41-55

Eichengreen, B., Faini, R., von Hagen and Wyplocz, C. (2004). *Economic aspects of the Annan plan for the solution of the Cyprus problem*, A report to the Government of the Republic of Cyprus.

Günçavdi, O. and Küçükçifi, S. (2008). Economic growth under embargoes in North Cyprus: an input-output analysis. *Oxford Development Studies*

McKee, D. L. and Tisdell, C. (1990). *Developmental Issues in Small Island Economies.* Praeger, New York and London.

Mehmet, O., Tahiroglu, M., Lisaniler, G. and Katircioglu, S. (2007). Labor mobility and labor market convergence in Cyprus. *Turkish Studies*:8:(1):43-69

Prasad, B., and Tisdell, C. (2006). *Institutions, Economic Performances and Sustainable Development: A Case Study of the Fiji Islands.* Nova Science Publishers, New York.

Smith, A. (1910). *The Wealth of Nations.* Dent and Sons, London.

Tisdell, C. and Fairbairn, T. I. (1984). Subsistence economies and unsustainable development and trade. *Journal of Development Studies*:20:227-241

Tisdell, C. (1990). *Natural Resources, Growth and Development.* Praeger, New York, Westport CT and London.

Tisdell, C. (2005). *Economics of Environmental Conservation 2nd Edn.* Edward Elgar, Cheltenham, UK and Northampton MA, USA.

Tisdell, C. (2007). Globalization and the economic future of small isolated nations, particularly in the Pacific. Pp. 4-21 in B. L. Prasad and K. C. Roy, (eds), *Development Problems and Prospects in Pacific Island States*. Nova Science Publishers, New York.

Tisdell, C. (2008). Global warming and the future of Pacific Island countries. *International Journal of Social Economics*:35:889-903

Tisdell, C. (2009). Economic reform and openness in China: China's development policies in the last 30 years. *Econonomic Analysis and Policy*:In press

ISSN 1444-8890

PREVIOUS WORKING PAPERS IN THE SERIES

ECONOMIC THEORY, APPLICATIONS AND ISSUES

1. Externalities, Thresholds and the Marketing of New Aquacultural Products: Theory and Examples by Clem Tisdell, January 2001.
2. Concepts of Competition in Theory and Practice by Serge Svizzero and Clem Tisdell, February 2001.
3. Diversity, Globalisation and Market Stability by Laurence Laselle, Serge Svizzero and Clem Tisdell, February 2001.
4. Globalisation, the Environment and Sustainability: EKC, Neo-Malthusian Concerns and the WTO by Clem Tisdell, March 2001.
5. Globalization, Social Welfare, Labor Markets and Fiscal Competition by Clem Tisdell and Serge Svizzero, May 2001.
6. Competition and Evolution in Economics and Ecology Compared by Clem Tisdell, May 2001.
7. The Political Economy of Globalisation: Processes involving the Role of Markets, Institutions and Governance by Clem Tisdell, May 2001.
8. Niches and Economic Competition: Implications for Economic Efficiency, Growth and Diversity by Clem Tisdell and Irmi Seidl, August 2001.
9. Socioeconomic Determinants of the Intra-Family Status of Wives in Rural India: An Extension of Earlier Analysis by Clem Tisdell, Kartik Roy and Gopal Regmi, August 2001.
10. Reconciling Globalisation and Technological Change: Growing Income Inequalities and Remedial Policies by Serge Svizzero and Clem Tisdell, October 2001.
11. Sustainability: Can it be Achieved? Is Economics the Bottom Line? by Clem Tisdell, October 2001.
12. Tourism as a Contributor to the Economic Diversification and Development of Small States: Its Strengths, Weaknesses and Potential for Brunei by Clem Tisdell, March 2002.
13. Unequal Gains of Nations from Globalisation by Clem Tisdell, Serge Svizzero and Laurence Laselle, May 2002.
14. The WTO and Labour Standards: Globalisation with Reference to India by Clem Tisdell, May 2002.
15. OLS and Tobit Analysis: When is Substitution Defensible Operationally? by Clevo Wilson and Clem Tisdell, May 2002.
16. Market-Oriented Reforms in Bangladesh and their Impact on Poverty by Clem Tisdell and Mohammad Alauddin, May 2002.
17. Economics and Tourism Development: Structural Features of Tourism and Economic Influences on its Vulnerability by Clem Tisdell, June 2002.
18. A Western Perspective of Kautilya's Arthasastra: Does it Provide a Basis for Economic Science? by Clem Tisdell, January 2003.
19. The Efficient Public Provision of Commodities: Transaction Cost, Bounded Rationality and Other Considerations.
20. Globalization, Social Welfare, and Labor Market Inequalities by Clem Tisdell and Serge Svizzero, June 2003.
21. A Western Perspective on Kautilya's 'Arthasastra' Does it Provide a Basis for Economic Science?, by Clem Tisdell, June 2003.
22. Economic Competition and Evolution: Are There Lessons from Ecology? by Clem Tisdell, June 2003.
23. Outbound Business Travel Depends on Business Returns: Australian Evidence by Darrian Collins and Clem Tisdell, August 2003.
24. China's Reformed Science and Technology System: An Overview and Assessment by Zhicun Gao and Clem Tisdell, August 2003.

25. Efficient Public Provision of Commodities: Transaction Costs, Bounded Rationality and Other Considerations by Clem Tisdell, August 2003.
26. Television Production: Its Changing Global Location, the Product Cycle and China by Zhicun Gao and Clem Tisdell, January 2004.
27. Transaction Costs and Bounded Rationality – Implications for Public Administration and Economic Policy by Clem Tisdell, January 2004.
28. Economics of Business Learning: The Need for Broader Perspectives in Managerial Economics by Clem Tisdell, April 2004.
29. Linear Break-Even Analysis: When is it Applicable to a Business? By Clem Tisdell, April 2004.
30. Australia's Economic Policies in an Era of Globalisation by Clem Tisdell, April 2004.
31. Tourism Development as a Dimension of Globalisation: Experiences and Policies of China and Australia by Clem Tisdell, May 2004.
32. Can Globalisation Result in Less Efficient and More Vulnerable Industries? by Clem Tisdell, October 2004.
33. An Overview of Globalisation and Economic Policy Responses by Clem Tisdell, November 2004.
34. Changing Abundance of Elephants and Willingness to Pay for their Conservation by Ranjith Bandara and Clem Tisdell, December 2004.
35. Economic Globalisation: The Process and its Potential Social, Economic, and Environmental Impacts by Clem Tisdell, October 2005.
36. Introduction: An Overview and Assessment of The Economics of Leisure by Clem Tisdell, November 2005.
37. Globalisation and the Economic Future of Small Isolated Nations, Particularly in the Pacific by Clem Tisdell, November 2005.
38. Business Partnerships in a Globalising World: Economic Considerations by Clem Tisdell, December 2005.
39. Economic and Business Relations Between Australia and China: An Overview and an Assessment by Clem Tisdell, November 2006.
40. China's Economic Performance and Transition in Relation to Globalisation: From Isolation to Centre-Stage? by Clem Tisdell, November 2006.
41. Knowledge and the Valuation of Public Goods and Experiential Commodities: Information Provision and Acquisition by Clem Tisdell, November 2006.
42. Students' Evaluation of Teaching Effectiveness: What Surveys Tell and What They Do Not Tell by Clem Tisdell and Mohammad Alauddin, November 2006.
43. Economic Prospects for Small Island Economies, Particularly in the South Pacific, in a Globalising World by Clem Tisdell, November 2006.
44. The Evolution and Classification of the Published Books of Clem Tisdell: A Brief Overview by Clem Tisdell, July 2007.
45. Cost-Benefit Analysis of Economic Globalization by Clem Tisdell, January 2008.
46. Economic Benefits and Drawbacks of Cities and their Growth Implications by Clem Tisdell, January, 2008.
47. Interfirm Networks in the Indonesian Garment Industry: Trust and Other Factors in their Formation and Duration and their Marketing Consequences by Latif Adam and Clem Tisdell, April, 2008.
48. Trust and its Implications for Economic Activity, Welfare and Globalisation by Clem Tisdell, April, 2008.
49. Economics, Corporate Sustainability and Social Responsibility by Clem Tisdell, May 2008.
50. Structural Transformation in the Pig Sector in an Adjusting Vietnam Market: A Preliminary Investigation of Supply-side Changes by Clem Tisdell, September 2008
51. Thirty Years of Economic Reform and Openness in China: Retrospect and Prospect by Clem Tisdell, October 2008.
52. Quantitative Impacts of Teaching Attributes on University TEVAL Scores And Their Implications by Clem Tisdell and Mohammad Alauddin, April 2009.

53. A Comparative Economic Study of the Chinese and Australian Cotton Production by Xufu Zhao and Clem Tisdell, May 2009
54. Trends in Vietnam's Pork Supply and Structural Features of its Pig Sector by Clem Tisdell, May 2009.
55. Economic Reform and Openness in China: China's Development Policies in the Last 30 Years by Clem Tisdell, June 2009.
56. The Survival of Small-scale Agricultural Producers in Asia, particularly Vietnam: General Issues Illustrated by Vietnam's Agricultural Sector, especially its Pig Production by Clem Tisdell, June 2009.
57. Economic Benefits and Drawbacks of Cities and their Growth Implications by Clem Tisdell, September 2009.