Sustainable Mobility
Exploring the Impact of Food Safety Standards on Global Tea Trade: 
A Gravity Model Based Approach

Karandagoda N W, Udugama J M M and Jayasinghe-Mudalige U K
Department of Agribusiness Management, 
Faculty of Agriculture and Plantation Management, 
Wayamba University of Sri Lanka

Keywords: Agricultural trade, Food safety standards, Gravity model, Tea exports, 
Technical barriers to trade (TBT)

Introduction

Tea – the world’s second most popular beverage with 22% global beverage market 
share – contributes nearly 1.9% to the GDP and Rs. Million 136,180 foreign exchange 
earnings in Sri Lanka with nearly 291 Million Kg. production in 2009. The Russia, 
United Kingdom and United States are the major importers of tea globally with about 
12, 8 and 7 percent of import share, respectively. The Russia, United Arab Emirates and 
Syria are the major importers of Sri Lankan tea, while Iran, Turkey and Jordan, 
individually, import more than 5% of tea produced domestically (International Tea 
Committee Statistical Bulletin, 2010).

The Food and Agriculture Organization has declare tea as an item of food in 1995, and 
since then, the tea exporting nations are now required to comply with specific food 
safety and quality standards to meet the demand for safer foods, which include those on 
usage of approved pesticides with minimum residue limits, microbiological parameters, 
and the limits on heavy metals. Further, the European Union’s Parliamentary Directive 
on Hygiene of Food Stuff makes it compliance to have a system of Hazard Analysis 
Critical Control Points (HACCP) in place in 2006 and it is now extended to have ISO 
22000 and Maximum Residue Level (MRL).

The economic analysis revealing global impacts of food safety standards on food and 
agricultural trade are relatively scares. Otsuki et al. (2001) and Wilson and Otsuki 
(2002) use Gravity Model approach and conclude that agricultural exports are 
negatively affected by importer specific standards. In another study, Yue et al. (2010) 
infer that MRL standards specified by the EU have affected the volume of tea exports 
significantly. In light of above, this paper employs the Gravity Model approach to 
examine the impact of food safety standards on global tea marketing.
Methodology

Theoretical Framework

The Gravity Model approach, which is based on the Newton’s ‘*Law of Universal Gravitation*’, suggests that the bilateral trade flows between two countries are positively related to size of the economy (represented by GDP) and inversely related to the geographical distance between them (DIS). This basic model was further expanded by incorporating other important variables, including: population (POP), language (LAN), colonial relationships (COL), whether the country is landlocked (LOCK) (Yue et al., 2010), and adoption of food safety standards (ISO 22000, MRL) (Equation 1):

\[
\ln Q_{ij} = \beta_0 + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \ln POP_i + \ln POP_j + \beta_5 \ln DIS_{ij} + \beta_6 DCOL_{ij} + \beta_7 DLAN_{ij} + \beta_8 DLOCK_{ij} + \beta_9 DISO22000_j + \beta_{10} DMRL_j + \epsilon_{ij}
\]

(1)

Where, \( \beta \) denotes the coefficients and \( i \) and \( j \) are exporting and importing countries, respectively (the notation D in the last five variables denotes dummy variable).

Collection and Analysis of Data

The secondary data were obtained from the United Nations Commodity Trade Statistics Database (total tea export values), International Monetary Fund’s World Economic Outlook Database (GDP, population), and CEPII Database (distance, colonial ties, common language, landlocked). Those exporting nations with more than 5% global market share (i.e. Kenya, China, Sri Lanka, India, Viet Nam and Indonesia) and importing at least 5% of global production of tea were considered for analysis. The data were initially analyzed without a simulation. Consequently, the model was re-estimated relaxing the variable “safety standards” assuming that the developed importing countries release all tea imports from ISO 22000 and MRL standards. A Hierarchical Cluster Analysis was carried out to identify the similarity clusters among the importing countries in 2009. More than 1% importing countries in 2009 was the grouped objects, and more than 5% exporting countries were used as cluster variables. The Statistical Package for Social Sciences (SPSS) (Version16) was used to estimate the Gravity Model and carry out the Cluster Analysis.

Results & Discussion

Signs of coefficients of the traditional gravity variables, including population, GDPs of exporter and importer, and distance were as expected (Table 1).
Table 1- Outcome of Gravity Model:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Expected Sign</th>
<th>Scenario 1</th>
<th>Scenario 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln POP$_i$</td>
<td>(-)</td>
<td>-1.34** (0.57)</td>
<td>-0.74 (0.56)</td>
</tr>
<tr>
<td>ln POP$_j$</td>
<td>(+)</td>
<td>1.08*** (0.39)</td>
<td>0.96*** (0.28)</td>
</tr>
<tr>
<td>ln GDP$_i$</td>
<td>(+)</td>
<td>1.08** (0.50)</td>
<td>0.54 (0.51)</td>
</tr>
<tr>
<td>ln GDP$_j$</td>
<td>(+)</td>
<td>0.06 (0.26)</td>
<td>0.20 (0.18)</td>
</tr>
<tr>
<td>ln DIS$_{ij}$</td>
<td>(-)</td>
<td>-1.50*** (0.51)</td>
<td>-0.93* (0.49)</td>
</tr>
<tr>
<td>DISO22000$_j$</td>
<td>(-)</td>
<td>2.00* (1.00)</td>
<td>3.47*** (0.86)</td>
</tr>
<tr>
<td>DMRL$_j$</td>
<td>(-)</td>
<td>-0.69 (0.67)</td>
<td>-2.64** (1.04)</td>
</tr>
<tr>
<td>DLOCK$_{ij}$</td>
<td>(-)</td>
<td>-1.02* (0.53)</td>
<td>-0.06 (0.50)</td>
</tr>
<tr>
<td>DCOL$_{ij}$</td>
<td>(+)</td>
<td>0.99 (0.81)</td>
<td>0.12 (0.74)</td>
</tr>
<tr>
<td>DLAN$_{ij}$</td>
<td>(+)</td>
<td>0.89 (0.86)</td>
<td>1.16 (0.79)</td>
</tr>
</tbody>
</table>

No of Observations 66
R$^2$ adjusted 0.509

Note: ***, ** and * denote the significance at 1%, 5% and 10%, respectively. Standard Errors are in parentheses.

The negative sign of exporting country’s population highlights that higher population decreases the quantity exported due to considerable amount of domestic consumption. The results further emphasized that exporting country’s GDP has a significant impact, though that of importing country was insignificant in tea trade. The positive and significant coefficient of ISO 22000 revealed that complying with the meta-system was seen as an added advantage augmenting the quantity traded. On the contrary, compliance to MRL had significant negative effects, implying hampering impacts. Being a landlocked importing country was seen to impose negative effects on tea trade, mainly due to higher cost of transportation. Surprisingly, sharing a common language and having colonial ties and business linkages did not significantly contribute to tea trade between the major tea trading partners. The outcome of analysis under the scenario of “relaxation of standards” highlighted that the sign of GDP, population and distance variables were as expected (Table 1). In this instance, only the importing country’s population and distance variables were seen to have a significant impact on trade. Differing from the first scenario, both ISO 22000 and MRL were significant at $\rho = 0.01$ and 0.05, respectively. Contrastingly, the coefficient of ISO 22000 was
positive, while that of MRL was negative. Thus, the results revealed that, *ceteris paribus*, mandatory ISO 22000 imposed by developed countries result in a four-fold increase in tea exported, while enforcement of MRL will decrease quantity by three times.

Figure 1 - Cluster analysis of major tea importers

The Dendrogram from Cluster Analysis shows six clusters at 71% similarity level (Figure 1 above). Russian Federation – the largest global tea importer – has been clustered separately at 55% similarity level due to exceptional amount of tea quantities imported. The other cluster consists of mostly the developed countries and transition economies due to the similarity in population and GDP implying that most of these nations trade in similar patterns.

Conclusions

The outcome of analysis, in contrary to the common belief that food safety standards hinder global agricultural trade, suggests that complying with a metasystem like ISO 22000 can have trade facilitating effects. Where Sri Lanka is of concern, it implies that adoption of such metasystems would have positive effects on tea exports to the European Union and Japan in the long run.
References


Comparative Advantage of Trade in Services of Sri Lanka in the SAARC Region

K M V Sachithra, G A C Sajeevi, M P K Withanawasam, and W M S Jayathilake
Faculty of Management Studies and Commerce, University of Sri Jayawardenepura, Sri Lanka

Key words: SAARC, Comparative Advantage, RCA, RSCA

Introduction

SAARC (South Asian Association for Regional Cooperation) was established to enhance welfare of the South Asians through economic and cultural relationships among its members. Member states comprise of Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Preferential trading agreements among member states act as a stimulus to strengthen national and SAARC economic resilience. So far member nations have implemented a free trade agreement (SAFTA) to maximize the realisation of the region's potential for trade and development, which would benefit the people of the region greatly.

The Export and Import economic policy has both advantages and disadvantages. In Sri Lanka, the export and import economy resulted in an unsymmetrical export portfolio which has continuously earned deficit trade balances. The trade in services is different from the trade in goods due to the inherent characteristics of services such as intangibility, invisibility, transience and non-storability. General Agreement on Trade in Services (GATS) classifies the entire range of services trade as Mode 1, Mode 2, Mode 3 and Mode 4 (United Nations, 2010).

According to Burange et al., (2009), many developing countries obtain large benefits from service exports. Due to the skilled and semi-skilled labour force these countries commence service exports under the Mode 1 and 4. The share of services trade as a percentage of total trade in Sri Lanka in 1978 was about 44.4 percent and 54.6 percent in 2000. Further, the contribution from services to GDP in 2010 was 59.3 percent.

Objectives

The main objective of this study is to evaluate regional competitiveness of trade in services of Sri Lanka to enhance trade strategies through mutual trade agreements.
In addition to that the following sub objectives are expected to be achieved:

- To identify competitive position of SAARC countries
- To develop strategic trade direction in SAARC countries

**Methodology**

Revealed Symmetric Comparative Advantage (RSCA) indices were used to identify the service sectors in which Sri Lanka has comparative advantage. Trade profiles of selected countries with SAARC region/World were used for this purpose. Dalum et al. (1998) have made Revealed Symmetric Comparative Advantage (RSCA) index, which is formulated as follows:

\[
RSCA_{ih} = \frac{(RCA_{ih} - 1)}{(RCA_{ih} + 1)}
\]

and

\[
RCA_{ih} = \frac{X_{ih}}{X_{it}} \frac{X_{wh}}{X_{wt}}
\]

Where;

- \(RCA_{ih}\) = revealed comparative advantage ratio for country i in service h,
- \(X_{ih}\) = country i’s exports of service h
- \(X_{it}\) = total exports of country i
- \(X_{wh}\) = world / SAARC exports of service h
- \(X_{wt}\) = total world/SAARC exports

The values of \(RSCA_{ih}\) index can vary from minus one to plus one. \(RSCA_{ih}\) greater than zero implies that country i has comparative advantage in group of services h. In contrast, \(RSCA_{ih}\) less than zero implies that country i has comparative disadvantage in group of services h.

The research study is based on data on exports and imports statistics published by the International Trade Centre (ITC). The study focuses on all export services of SAARC region and the research time frame is five years from 2006 to 2010.

**Results**

According to the findings (Table 01 and 02), Sri Lanka had 0.601, 0.327, 0.733, 0.594 and 0.399 RSCA values in 2010 on Transportation, Travel, Communication, Construction and Insurance Services respectively. But, RSCA was minus (-1.00) for Financial services, Royalties, and Personal and Cultural services.
Table 1: RSCA Index of SAARC Region for selected countries (2006-2010)

<table>
<thead>
<tr>
<th>Service Description</th>
<th>RSCA Index - SAARC</th>
<th>RSCA Index - World</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2006</td>
<td>2007</td>
</tr>
<tr>
<td>Transportation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Sri Lanka</td>
<td>0.48</td>
<td>0.60</td>
</tr>
<tr>
<td>– India</td>
<td>-0.05</td>
<td>-0.06</td>
</tr>
<tr>
<td>Travel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Sri Lanka</td>
<td>0.20</td>
<td>0.25</td>
</tr>
<tr>
<td>- Bangladesh</td>
<td>-0.28</td>
<td>-0.02</td>
</tr>
<tr>
<td>- Maldives</td>
<td>0.47</td>
<td>0.55</td>
</tr>
<tr>
<td>- Bhutan</td>
<td>0.45</td>
<td>0.57</td>
</tr>
<tr>
<td>- India</td>
<td>-0.01</td>
<td>-0.02</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Sri Lanka</td>
<td>0.39</td>
<td>0.44</td>
</tr>
<tr>
<td>- Nepal</td>
<td>0.36</td>
<td>0.46</td>
</tr>
<tr>
<td>- India</td>
<td>-0.00</td>
<td>-0.02</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Sri Lanka</td>
<td>0.21</td>
<td>0.33</td>
</tr>
<tr>
<td>- India</td>
<td>-0.67</td>
<td>-0.60</td>
</tr>
<tr>
<td>Insurance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Sri Lanka</td>
<td>0.27</td>
<td>0.30</td>
</tr>
<tr>
<td>- India</td>
<td>-0.36</td>
<td>-0.30</td>
</tr>
<tr>
<td>Financial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Sri Lanka</td>
<td>-1.00</td>
<td>-1.00</td>
</tr>
<tr>
<td>- India</td>
<td>0.05</td>
<td>0.03</td>
</tr>
<tr>
<td>Computer and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Sri Lanka</td>
<td>-0.78</td>
<td>-0.60</td>
</tr>
<tr>
<td>- India</td>
<td>0.06</td>
<td>0.04</td>
</tr>
<tr>
<td>Royalties and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>License fees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Sri Lanka</td>
<td>-1.00</td>
<td>-1.00</td>
</tr>
<tr>
<td>- India</td>
<td>-0.28</td>
<td>-0.07</td>
</tr>
<tr>
<td>Other services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Sri Lanka</td>
<td>0.75</td>
<td>-0.35</td>
</tr>
<tr>
<td>- India</td>
<td>-1.00</td>
<td>0.02</td>
</tr>
<tr>
<td>– Pakistan</td>
<td>0.78</td>
<td>-0.35</td>
</tr>
<tr>
<td>– Bangladesh</td>
<td>0.85</td>
<td>0.01</td>
</tr>
<tr>
<td>– Nepal</td>
<td>0.78</td>
<td>-0.31</td>
</tr>
<tr>
<td>Personal,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultural and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recreational</td>
<td></td>
<td></td>
</tr>
<tr>
<td>– Sri Lanka</td>
<td>-1.00</td>
<td>-1.00</td>
</tr>
<tr>
<td>- India</td>
<td>0.06</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Source: Compiled by authors based on ITC Statistics Database
Table 2: Strategic Trade Direction Matrix

<table>
<thead>
<tr>
<th>Service Importer</th>
<th>Country</th>
<th>IND</th>
<th>PAK</th>
<th>SRL</th>
<th>BGD</th>
<th>MLD</th>
<th>NEP</th>
<th>BHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>India (IND)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FS , PC, CI</td>
<td>CO, FS, CI, PC</td>
<td>CI, RO, PC, FS, OB</td>
<td>TP, IN, FS, CO, CI, RO, PC</td>
<td>TP, CO, IN, FS, CM, CI, OB, PC</td>
<td>TP, IN, FS, CO, CI, RO, PC</td>
<td>CO, FS, CM, CI, OB, RO, PC</td>
<td></td>
</tr>
<tr>
<td>Pakistan (PAK)</td>
<td>TP, TV, CM, OB, RO</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TF, TV, CM, IN, CO</td>
<td>TP, TV, CM, IN, CO, CI</td>
<td>TP, TV, CM, IN, CO, CI, OB</td>
<td>TP, CM, IN, FS, CI, OB</td>
<td>TP, CM, IN, FS, CI, OB</td>
<td>TP, TV, CM, IN, CO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sri Lanka (SRL)</td>
<td>TP, TV, CM, IN, CO</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bangladesh (BGD)</td>
<td>TV, CM, OB</td>
<td>CM, FS, OB, PC</td>
<td>FS, OB, RO, PC</td>
<td>OB</td>
<td>TP, TV, CM, IN, FS, CI, OB</td>
<td>TP, TV, CM, IN, FS, CI, OB</td>
<td>CM, FS, CI, OB, PC</td>
<td></td>
</tr>
<tr>
<td>Maldives (MLD)</td>
<td>TV, RO</td>
<td>TV, RO</td>
<td>TV, RO</td>
<td>RO</td>
<td>TV, RO</td>
<td>RO</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nepal (NEP)</td>
<td>TV, CM, OB</td>
<td>CM, OB</td>
<td>OB</td>
<td>CM</td>
<td>TP, CM, IN, OB</td>
<td>No</td>
<td>CM, OB</td>
<td></td>
</tr>
<tr>
<td>Bhutan (BHT)</td>
<td>TP, TV IN</td>
<td>TV, IN</td>
<td>TV, FS, RO</td>
<td>TP, TV IN</td>
<td>TP, TV, CM, IN, FS, OB</td>
<td>TP, TV, CM, IN, FS, RO</td>
<td>TV</td>
<td></td>
</tr>
</tbody>
</table>

Source: Compiled by authors based on ITC Statistics Database

Note: Services given in the Bold in the matrix should be specialized in the corresponding country

Abbreviations:
TP – Transportation, TV – Travel, CM – Communication, CO – Construction,
IN – Insurance, FS – Financial Services, CI – Computer and Information,
RO – Royalties, OB – Other Business, PC – Personal and Cultural
Computer and Information service indicated a negative (−0.591) RSCA value in the SAARC region, though it became positive (0.302) when the RSCA value was computed in comparison to the rest of the world. Other Business services indicated a negative (−0.260) value for the SAARC region in 2010, while, the index vis-à-vis global comparison was -0.432.

**Conclusion and Policy Recommendations**

As far as the study revealed, compared to year 2006, Sri Lanka has been able to stabilise its comparative advantage and export specialisation in the service sector by 2010. However, the strength of competitiveness in service exports fluctuated throughout. Sri Lanka has not attempted exporting financial services, royalties and license fees, and personal, cultural and recreational services to international markets, despite having the highest comparative advantage in the SAARC region for Transportation, Construction, Insurance and Communication services. In addition, Sri Lanka has comparative advantage on travel compared to India and also demonstrates a significant advantage in Computer and Information services after India.

Strategic position of SAARC counties (Table 2) reflects the service trade advantage in the region; viz: India in Financial Services, Personal & Cultural, and Computer & Information services, Bangladesh on Other Business Services, Maldives on Royalties and Bhutan on Travel. However, Pakistan and Nepal do not have strategic positions on service trade in the region. Even though these countries individually do not have strategic positions for certain services they could have significant advantage if bilateral trade agreements are implemented. Therefore it is concluded that SAARC region is able to enhance its trade in services by increasing intra-regional trade among the members.

**References**


Indo–Sri Lanka Free Trade Agreement:
A Critical Appraisal of the Influence on Trade Between the Two Countries

T. Lalithasiri Gunaruwan
Department of Economics, University of Colombo, Sri Lanka
and
K.A. Inoka de Alwis
Ministry of Industry and Commerce, Sri Lanka

Key Words: Indo-Lanka Free Trade Agreement, Negative List, Preferential Treatment, Import Intensities of GDP, Trade Diversification

Introduction

With the objective of expanding trade between the two countries, India and Sri Lanka entered into the Indo-Sri Lanka Free Trade Agreement (ISFTA) in 1998, which came into effect in 2000. A decade later, the question has arisen as to whether the Preferential Trade Agreement has benefitted the economies of the two nations, particularly from the Sri Lankan perspective. This question has become more pertinent in the midst of divergent opinions expressed on the possible implications of the Comprehensive Economic Partnership Programme (CEPA) which is being negotiated with a view to further broadening the framework of economic cooperation between the two countries.

An appraisal of the influence of the ISFTA on the evolution of Indo-Lanka trade has become the need of the hour. Even though a number of studies have already been conducted in this area, there appears to be no consensus among the researches as to its effectiveness and impacts. The present study therefore, is an attempt to review the Agreement, through the analysis of Sri Lanka’s trade with India and with the rest of the world, during the post ISFTA era, in comparison to the trade patterns in the pre Agreement period.

Data and Methodology

The study looked at the problem from a Sri Lankan view point, and analysed Sri Lanka’s international trade data since 1994. The data, primarily sourced from the Sri Lanka Customs, were classified into ISFTA-neutral and ISFTA-favoured categories, and into imports from, and export to, India and the rest of the world. Trends were

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1 Currently following the Masters degree programme in Financial Economics, University of Colombo, Sri Lanka.

analysed in volume (or “real”) terms in view of removing any price-based effects, and against the corresponding real GDP values to capture deviations from what is generally observed in association with the change of GDP. Such deviations were used as indicators of effectiveness of intervening conjunctures, including the coming into effect of ISFTA.

**Results and Conclusions**

The analytical results indicate that the Sri Lankan economy is becoming increasingly import intensive (from 17% prior to the year 2000 to almost 25% by 2010, in real terms, as a ratio of GDP). This trend invites attention of the policy makers, as it could have medium term Balance of Payments and external finance implications. The share of imports of Indian origin has grown significantly, from a mere 10% during the late 1990s to 23% by 2010. However, this growth of overall import intensity appears to have been driven mainly by the imports of Indian origin in the ISFTA-neutral category, and therefore cannot be identified as an effect of the ISFTA.

**Figure 1 : Evolution of Sri Lanka’s Imports in relation to GDP**
Figure 1 (above) presents the evolution of Sri Lanka’s imports from India and from “rest of the world” in relation to GDP during pre and post ISFTA periods, and for ISFTA-favoured and ISFTA-neutral categories of imports, while Table 1 summarises import intensities of Sri Lanka’s GDP, worked out under the linearity assumption of trends.

Table 1 : Sri Lanka’s Import Intensities of GDP 1994 -2010

<table>
<thead>
<tr>
<th>Origin</th>
<th>ISFTA-Neutral List</th>
<th>ISFTA-Favoured List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imports from India</td>
<td>0.09 (5%)</td>
<td>1.14 (35%)</td>
</tr>
<tr>
<td>Imports from “Rest of the world”</td>
<td>1.80 (95%)</td>
<td>2.09 (65%)</td>
</tr>
<tr>
<td>All Imports</td>
<td>1.89</td>
<td>3.23</td>
</tr>
</tbody>
</table>

Source : Authors’ Estimations

If trends pertaining to the ISFTA-neutral category reflect “relative competitiveness” of Indian exports to Sri Lanka as against those from the rest of the world, the above analysis leads to the conclusion that India has been able to outperform the rest of the world in both categories of products during the post-ISFTA period. However, the tangential deviation in the ISFTA–neutral category of imports from India has been much greater than that associated with the ISFTA-favoured category of imports (Table 2). This implies that the tariff advantages accorded to India in the ISFTA-favoured category of imports have not been effective in infusing the expected “supplementary momentum”, over and above what could be attributable to her “competitive edge”.

Table 2:  Tangential deviations of Import Intensities of GDP with the implementation of the ISFTA

<table>
<thead>
<tr>
<th>Deviation of $\mu$</th>
<th>ISFTA-Neutral Category</th>
<th>ISFTA-favoured Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imports of Indian Origin</td>
<td>+ 0.95</td>
<td>+ 0.03</td>
</tr>
<tr>
<td>Imports from Rest of the World</td>
<td>+ 0.06</td>
<td>- 0.33</td>
</tr>
</tbody>
</table>

Source : Authors’ Estimations

3 The “ISFTA-Neutral” category of imports to Sri Lanka includes both ISFTA “Negative List” items as well as those with “Zero Duty”, for which items, there is no distinction between India and the rest of the world in terms of duty structure.

4 Tangent of the Angle of Deviation = $(m_2 - m_1)/(1+m_1m_2)$
The above tangential deviations also indicate that, with regard to the ISFTA-favoured category, the “rest of the world” has not been able to maintain the “positive shift” of import intensity it managed in the ISFTA-neutral category. Despite the apparently weak overall shift of import intensity in this category, the positive deviation of imports from India and the negative deviation in the “rest of the world” category, could possibly suggest a “trade diversion effect” of ISFTA in favour of India.\(^5\)

With regard to exports, Sri Lanka appears to have been able to derive significant benefits from ISFTA during 2002-2005, attributable to Vanaspathi\(^6\) and Copper exports to India, as indicated by the “export peak” (refer to Figure 2) in the ISFTA-favoured category.

Figure 2: Evolution of Sri Lankan Exports to India against Sri Lanka’s GDP

However, as evident from the Figure 2, this “surge” has completely disappeared by 2008 when Indian authorities took counter-measures\(^7\), and therefore, the exceptional export peak, which could not be sustained, was excluded when comparative medium term trends of exports to GDP ratios (Table 3) were computed.

\(^5\) This could be contested as “trade diversion”, according to trade theories, is when trade shifts take place owing to preferential tariff systems yielding overall welfare losses.

\(^6\) A product, manufactured of partially hydrogenated vegetable oils, used in cooking and in manufacturing of confectionaries.

\(^7\) The tariff advantage
Table 3: Sri Lanka’s Exports as a ratio of GDP 1994 -2010

<table>
<thead>
<tr>
<th>Origin</th>
<th>ISFTA-Negative category</th>
<th>ISFTA-favoured category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exports to India</td>
<td>-0.06</td>
<td>0.26</td>
</tr>
<tr>
<td>Exports to the rest of the world</td>
<td>15.00</td>
<td>-1.04</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.21</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-0.33</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.63</td>
</tr>
</tbody>
</table>

Source: Authors’ Estimations

In relation to GDP, the performance of Sri Lanka’s exports to non-Indian markets has been better in the ISFTA favoured category, while the inverse has happened in the ISFTA negative category. This would not be expected if the ISFTA was “effective”.

With regard to Sri Lanka’s exports to India, the ratio to GDP has grown much faster in the ISFTA-negative category than in the category where Sri Lankan exports would enjoy preferential treatment under the ISFTA. Thus, it could be concluded that the ISFTA has not been “effective” in promoting Sri Lankan exports to Indian market.

References


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With the exception of the cases of Vanaspathi and Copper exports.
External Challenges to Shipping Hub Status of Sri Lanka

Jayantha Rathnayake
CINEC Maritime Campus, Malabe, Sri Lanka

Key words: External challenges, Shipping Hub status, New Indian ports, Transshipment cargo, Port development models.

Introduction

Among others, Sri Lanka has identified that achieving a shipping hub status similar to that of Singapore in the South Asian region is the way forward for rapid economic development. According to the plans in place the shipping hub status is expected to be achieved by expanding the transshipment services offered by Colombo port and growing beyond merely transshipment hub for India.

However, one may foresee several challenges to this plan and one such is the enthusiasm in the neighboring countries to build new ports and developing existing ones. Among those, the keen interest shown by India to develop ports is a major concern and could cost Sri Lanka 80% of its transshipment container volume.

Picture 1. New Indian ports.

Source: Google maps
These ports aim at stopping Indian cargo being transshipped via Colombo by attracting main line vessels to these newly developed Indian ports. As a consequence, transshipment volume at port of Colombo has seen reducing over a few years.

Table 1. Indian container volume and volume transshipped at Colombo (TEUs)

<table>
<thead>
<tr>
<th>Year</th>
<th>Colombo total T/S volume</th>
<th>% change over the previous year</th>
<th>Indian total volume</th>
<th>Transshipped at Colombo TEUs</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>2,449,500</td>
<td>36.6 %</td>
<td>6,141,148</td>
<td>842,973</td>
<td>13</td>
</tr>
<tr>
<td>2007</td>
<td>2,468,661</td>
<td>9.7 %</td>
<td>7,398,211</td>
<td>883,094</td>
<td>11</td>
</tr>
<tr>
<td>2008</td>
<td>2,785,422</td>
<td>12.83 %</td>
<td>7,672,457</td>
<td>1,030,731</td>
<td>13</td>
</tr>
<tr>
<td>2009</td>
<td>2,633,055</td>
<td>-5.47 %</td>
<td>8,035,849</td>
<td>976,428</td>
<td>12</td>
</tr>
<tr>
<td>2010</td>
<td>3,095,589</td>
<td>17.57 %</td>
<td>9,752,908</td>
<td>1,193,627</td>
<td>12</td>
</tr>
<tr>
<td>2011</td>
<td>3,123,828</td>
<td>0.91 %</td>
<td>10,045,495</td>
<td>1,295,747</td>
<td>12</td>
</tr>
<tr>
<td>2012</td>
<td>2,996,000 (estimated)</td>
<td>-5.1 %</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: CASA, SLPA & World Bank

The proposed Sethusamudram shipping canal could further reduce the transshipment container volume handled by Colombo and could be a significant challenge to realise the hub dream of Colombo.

For instance, Chennai port developing in to a container port deprived Colombo over 800,000 TEUs per annum and Indian port officials giving full emphasis in developing new ports i.e. Vizinjam and Vallapadam to make them transshipment ports as alternatives to Colombo, are the dark clouds that are gathering in the horizon. Loss of hub status would deprive Sri Lanka the economic benefits from enhancing global containerized cargo volume which is expected to grow to 780 million TEUs by 2015, from 530 million TEUs in 2008 and to 15 million TEUs from current 9 million TEUs in India.

This study aims at examining the threats faced by Sri Lanka in the intent of her becoming a major transhipment hub in the region, while focusing the particular attention of the research on external factors that may be effective.
Data and Methodology

The theory of Competitive Advantage proposed by Michel Porter in 1985\(^9\) was adopted as the conceptual framework for this study. Methodology adopted was the comparative analysis of historical data against current data, maintained by marine-organisations in India and Sri Lanka. Three main external challenges, namely, Indian port development, trend of Colombo’s transshipment volumes, and Sathusamudram Canal Project, all associated with India, were taken into account in this analysis.

Secondary data sources were relied upon as the collection of primary data pertaining to the two countries and over 13 sea ports was not feasible. Thus, secondary data on container throughput of existing and newly developed Indian ports, data on Colombo transshipment containers maintained by feeder companies and domestic container data maintained by Sri Lanka Ports Authority (SLPA) were gathered.

Results

Analysis of these data and other information shows that the growing Indian ports in particular will have the potential of affecting Sri Lankan ports significantly.

Though Sri Lanka is endowed with a multiple trade-conducive factors to become a maritime hub, and thus placing the country in a relatively competitive advantageous position, the combined effect of the above external factors would imply:

- reduction of transhipment volume at Sri Lankan ports.
- consequently, high investment made on developing Sri Lankan ports accruing an economic loss to the country.
- loss of hitherto maintained regional transhipment port status by Sri Lanka
- loss of handling cargo from India to the tune of around USD 200 million annually.
- main shipping lines dropping Colombo in favour of Indian ports, entailing loss of ancillary business.

Conclusions

The study concludes that the impact of these factors could be profound, and could also lead to Sri Lanka losing her transhipment hub status leading to economic loss to the country through under utilization of existing and newly constructed port terminals, and that a “hybrid approach” (making the country en masse a hub rather than developing a single port hub) coupled with change of the hitherto-practiced port development model

could possibly help Sri Lanka facing these external challenges. Sri Lankan strategy should essentially focus on helping the industry face such challenges, through sustained attractiveness to shipping lines, possibly by way of ensuring flexibility, efficiency and expeditious decision making. Such would afford opportunity for the main shipping lines to re-group around Colombo and other Sri Lankan ports, and could ensure continuation of hub status.

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Connectivity of Bandaranaike International Airport (BIA) as an Aviation Hub of the Future: The Way Forward

M D C D Mannawaduge, H M C Nimalsiri
The Civil Aviation Authority of Sri Lanka

and

L W D Piyathilake, K P Herath
Department of Transport and Logistics Management, University of Moratuwa, Sri Lanka

Key Words: Airport Capacity and Utilisation, Connectivity attributes, Hub Connectivity Index, Flight Scheduling, Sri Lanka as an Aviation Hub

Introduction

Sri Lanka’s national policies envisage developing the island into an aviation hub in the South Asian region. The key feature of a hub airport is to have a coordinated set of arrival and departure flights from different airports (spokes). By consolidating these traffic flows the hub and spoke system gives a wider choice of transfer options to passengers allowing accessibility across different origins and destinations improving the connectivity offered. Airlines also benefit through the said hub and spoke system as origins and destinations that cannot be connected through a direct flight are facilitated in this manner. Measuring the connectivity offered at BIA as a potential hub airport is vital in the process of assessing the government plans for the development of the country’s airports.

According to Reynolds-Feighen (2001) cited in Burghouwt and Wit (2005), spatial concentration (geographical concentration of an airlines’ network around a hub/hubs) and temporal configuration are the two main features of a hub and spoke network in terms of the connectivity it provides. Temporal configuration, the focus of this study, deals with hub time table coordination where a synchronised, daily bank set of flights is operated through the hubs. This is measured using both quantity and quality of connections offered by airlines operating at the hub (Veldhuis, 1997; Burghouwt and Wit, 2005 and Li, et al., 2012). Temporal co-ordination also refers to a wave system structure organised at the hub for arrival and departure flights. In an “ideal wave” structure, the arrival wave would be followed by a transfer period and a corresponding departure wave of flights (Danesi, 2006).
Objectives

The objective of this study was to assess the temporal configuration of Bandaranaike International Airport (BIA) with the aim of evaluating (a) how it has utilised the available runway capacities (in terms of slots offered) and also (b) schedule coordination between the operating airlines to increase connectivity.

This paper has two objectives:

1. Identification of the wave system structure at BIA – to assess whether there is a coordinated set of arrival waves and corresponding departure waves
2. Analysis of the level of connectivity offered at BIA – to assess the indirect connectivity offered via BIA through these wave system structures as against direct connections

Methodology

A wave system structure should have a number of continuous flight waves and hub repeat cycles (Danesi, 2006). Methodology followed by Danesi (2006) to assess airline hub waves has been adapted to suit airports by counting the number of departures and arrivals in each hour of the day. Plotting the count against time on a bar chart, arrival and departure waves are identified. Then observations are made to identify whether this cycle repeats in the same manner and throughout the seven days of the week.

The connectivity of the wave system structure has been identified mainly using methods by Li, et al. (2012). Quantity of connectivity is measured by the number of viable connections falling into the viable connection threshold (VCT), defined as a connection which satisfies both the minimum connecting time (MCT) of 45 minutes (Doganis and Dennis, 1997) and the maximum acceptable connecting time (MACT) of 180 minutes, for a flight after arriving at the hub airport (considering the standards used by the national carrier as well as landside and airside infrastructure limitations at BIA). Sum of all these connections within the VCT was identified as the quantity of viable connections (QVC). QVC indicate the number of all possible connections resulting from BIA Flight Schedule; the larger the QVC, the more connecting opportunities the BIA provides. The connections established between low cost carriers and full service carriers were eliminated as low cost carriers do not have code share agreements, nor do they provide interlining facilities.

Quality can be defined as the attractiveness of the indirect connections provided, which are measured using time and routing factor as the two variables. Time variable is
determined by taking the ratio of non-stop flight to perceived travel times of the indirect connection. Perceived travel time includes actual flying time of two connecting segments plus the transfer time after applying a penalty factor (Li, et al., 2012). The penalty factor is introduced in order to take into account disutility experienced by passengers when transferring against flying direct. The model also encompasses a routing factor (RF) calculated by dividing the indirect distance by direct distance of two connecting flight segments and values (1, 0 and 0.5) were assigned for a resulting de-routing factor (DRF) as follows:

\[
RF = 1, \quad DRF \leq 1.2 \\
RF = 0, \quad 1.5 < DRF \\
RF = 0.5, \quad 1.2 < DRF \leq 1.5
\]

Connections which satisfy the quality and quantity of connection were determined as per the above explained methodology within a week in the month of July. By summing the product of Quantity of Viable Connections (QVC) and Quality of Connectivity Index (QCI) the Hub Connectivity Indicator (HCI) was calculated after excluding the connections with a QCI closer or equal to “0”. One unit of HCI is equal to one indirect connection.

**Results**

Though the observations above (Figure 1) do not reveal a structure of an ideal wave system, the BIA, inclusive of all airline operations, seems to have on average four waves which repeat approximately on all days of the week from 0400–0900hrs, 1000–1400hrs and 1500–2100hrs and 2200–0200hrs. This wave system structure is particularly influenced by the activities of the hub carrier, Sri Lankan Airlines (ALK/UL), which operates four flight waves aligned to the above mentioned times. Operations appear peaking during early morning and late night with the contribution of other airlines as well; but, during the midday, only the ALK flights provide a significant contribution to create a wave.

Total 894 arrivals and departures are handled at BIA per week, while BIA’s single runway with the current capacity constraints can only handle twenty five (25) flights in any given hour. The full capacity of BIA is only utilised during 0500-0600, 0800-0900 and 1900-2000 hours. The above said total arrivals and departures make 1961 (QVC) indirect connections falling within the VCT, resulting in a Hub Connectivity Indicator (HCI) of 750.7. Only 38% of QVC indirect connections turn out to be quality connections to passengers at BIA. Sri Lankan airlines as the hub carrier accounts for 86% of the above said (HCI) at BIA by making 1703 of the total connections. The quality of these connections only accounts for an index of 265.9 as a major portion of
the connections that fall within the VCT are found closer to the higher threshold limit and only 36% are found closer to the nearer threshold limit. For example, with regard to the Kuwait- Male connection via BIA, the perceived transfer time between flight arrival and departure accounts for 140 minutes, thus falls closer to the upper bound of the VCT.

Figure 1: Weekly Hub Wave System at BIA

Table 1: Comparison on Quantity of Viable Connections (QVC) and Hub Connectivity Indicator (HCI)

<table>
<thead>
<tr>
<th></th>
<th>All Airlines</th>
<th>ALK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total arrivals and Departures</td>
<td>894</td>
<td>471</td>
</tr>
<tr>
<td>Quantity of Viable Connection (QVC) - indirect Connections made by all airlines within Viable Connection Threshold (VCT)</td>
<td>1961</td>
<td>1703</td>
</tr>
<tr>
<td>Quality of the indirect connections</td>
<td>305.2</td>
<td>265.9</td>
</tr>
<tr>
<td>Hub Connectivity Indicator(HCI) of the Quantity of Viable Connection (QVC)</td>
<td>750.7</td>
<td>640.4</td>
</tr>
</tbody>
</table>

Source: (Li, et al., 2012)

**Conclusion and Policy recommendations**

SriLankan Airlines is the hub carrier which provides a major portion of the connections formed. However, an overwhelming majority of their connections are not within the specified VCT, and even the connections provided by the airline that fall within the VCT are closer to the upper margin of the threshold than to the lower margin. This
indicates that their quality of connectivity is inadequate, and that the ALK needs to substantially improve its connectivity by taking into consideration the other arrival and departure flights within the threshold of 45–180 minutes to provide a better connectivity through BIA.

Given the policy directions and recommendations to encourage transferring via BIA and establish its position as a hub, it is imperative to take into consideration factors such as limitations at the BIA on the airside and landside handling, even though more flights can be accommodated on the runway with the present infrastructure. The quality of connections provided may be hindered by the negative records on punctuality at BIA by the handling agent (on average 75%). Hence, the standard VCT of 45, which is much below the current levels, may not be practical within such a context.

Aviation policy should direct the operators to optimise the current capacity at BIA with coordinated schedule planning in slot allocation to airlines. The national carrier has a significant role to play in coordinating with other airlines and planning its schedules to improve the quality of the indirect connections provided.

References


Conservation and Sustainable Utilisation of Nature Resources is Best Possible with Ecotourism Initiatives: Case study on Mangrove Tourism

P. Upali Ratnayake
Sri Lanka Tourism Development Authority, Colombo, Sri Lanka

Key words: Mangrove, Conservation, Sustainable Tourism, Coastal Communities, Alternative income, Ecotourism

Introduction

Mangrove plant communities are a comprehensive economic and non economic contributor of mankind. Being important nursery and breeding sites for birds, fish, crustaceans, shellfish, reptiles and mammals (Alongi, 2002 & Melana, 2000), they are a valuable ecological and economic resource. They also are a renewable source of wood, and act as accumulation sites for sediments, contaminants, carbon and nutrients. They offer protection for coastal communities and resist against coastal erosion (Liyanage, 2010).

Natural hazards such as storms, cyclones and most recently the Indian Ocean Tsunami have repeatedly shown the value of mangroves and the repercussions of unregulated destruction and extraction by man (Melana, 2000). Among the major reasons for the destruction of mangroves are the urban development, aquaculture, mining and the over exploitation of mangroves for timber, fish, crustaceans and shellfish. Over the next 30 years, unrestricted clear felling, further development of aquaculture and continuing overexploitation of fisheries will be the greatest threats to mangroves, while alteration of hydrology, pollution and global warming also would contribute as threats. Loss of mangrove biodiversity is, and will continue to be, a severe problem as even pristine mangroves are species-poor compared with other tropical ecosystems (Alongi, 2002).

Table 1: Mangrove Species of Sri Lanka

<table>
<thead>
<tr>
<th>Species Type</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very common species</td>
<td>4</td>
</tr>
<tr>
<td>Common species</td>
<td>10</td>
</tr>
<tr>
<td>Rare species</td>
<td>3</td>
</tr>
<tr>
<td>Very rare species</td>
<td>3</td>
</tr>
<tr>
<td>Total Mangrove species</td>
<td>20</td>
</tr>
</tbody>
</table>

Four major genesis (*Avicennia, Rhizophora, Bruguiera, and Sonneratia*)

Source: Department of Forest Conservation, Sri Lanka
Mangrove conservation and restoration are often viewed with suspicion in terms of long-term sustainability, due to lack of awareness, knowledge and the absence of systemic tangible benefits at the community level. Given the extent of the challenges in terms of the scarcity of land for human needs, which continues to give rise to pressure on mangrove and wetlands, there is an ever more pressing need to develop alternative conservation approaches, which link mangrove conservation and restoration with other forms of coastal industry development, in particular tourism, as a noneextractive means of use ensures mangroves’ future sustainability. If no action is taken and mangrove forests continue to be exploited at the current rate without addressing the need to manage these valuable resources on a sustainable basis, the best hope of mangroves by about 2030 would be a reduction in human population growth (Alongi, 2002).

**Objectives**

This study focuses on mangroves as a sensitive and important flora group to assess its wide economic, non-economic and non-extractive benefits with tourism and review on present conservation and sustainable utilisation methods with alternatives, as well as to identify what kinds of tourism (tourist, their facilities and activities) and the development of nature research/education are necessary and acceptable to support livelihood development systems in areas where mangroves are most at risk.

**Methodology**

The study ascertained the economic and non-economic benefits of mangrove and the direct and indirect benefits generated by mangroves for mankind, using secondary data sources. The study also reviewed the mangrove restoration areas, their geographical distribution and the local and locational values of the present mangrove ecosystem and social systems.

<table>
<thead>
<tr>
<th>District</th>
<th>Mangrove Area (Hectares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Puttalam</td>
<td>3210</td>
</tr>
<tr>
<td>Jaffna</td>
<td>2276</td>
</tr>
<tr>
<td>Trincomalee</td>
<td>2043</td>
</tr>
<tr>
<td>Batticaloa</td>
<td>1303</td>
</tr>
<tr>
<td>Kilinochchi</td>
<td>770</td>
</tr>
<tr>
<td>Hambanatota</td>
<td>576</td>
</tr>
<tr>
<td>Mullaitive</td>
<td>428</td>
</tr>
<tr>
<td>Gampaha</td>
<td>313</td>
</tr>
<tr>
<td>Galle</td>
<td>238</td>
</tr>
<tr>
<td>Ampara</td>
<td>100</td>
</tr>
<tr>
<td>Colombo</td>
<td>39</td>
</tr>
<tr>
<td>Kalutara</td>
<td>12</td>
</tr>
<tr>
<td>Matara</td>
<td>7</td>
</tr>
<tr>
<td>Total in Coastal area</td>
<td>12189*</td>
</tr>
</tbody>
</table>

*Source: Department of Forest Conservation, Sri Lanka*

*Total may not be the sum*
The study paid specific attention to the present day knowledge of the community (i.e., both general and scientific) about the surrounding mangrove communities and their associated ecosystem and biodiversity. Also investigated are the direct benefits that are likely to promote positive responses and support from the neighbouring coastal community by the successful conclusion of the restoration and conservation initiatives. Restoration and conservation initiatives which would be sustainable for the next generation of the society by 2030, also are examined.

**Results**

The results show that about half of the community gains tourism based income (51.8%) and other 28.5% has tourism related secondary income. This means that these communities are dependent on tourism. On the other only less than 20% had knowledge on mangrove environmental value, while almost 75% use mangroves as firewood. This indicates the threat mangroves are facing today. The tourism based activities the communities are engaged in are mostly ad-hoc in nature, and they principally cater to domestic tourists. But they use coastal resources for economic gain with no care for or knowledge of such resources. It was found that only 11.7% of the population do not harm this valuable ecosystem.

With regard to income of the household, the communities were inquired as to whether there were significant contribution coming from tourism. It was found that around 38.7% did not get any income from tourism industry. About 23% confessed that tourism partly contributed to their income while around 12% of households were found earning about half of their income through tourism. Around 27 percent admitted that their total income was generated from the tourism industry. Community knowledge on mangrove was low, reflected by approximately 62% having no knowledge about it, and another 19.7% having only a little knowledge. Only 12.4% of the community admitted that they were aware of it. However, Most of them (77.4%) consented to learn about mangrove ecosystem for tourism and ecotourism initiatives, and this willingness to learn and their readiness to co-operate, become important factors for future strategic development.

Community was not happy about present tourism practices which were ad-hoc operation with visitor activities, but were willing to work in tourism. Majority (62%) thought positive on tourism and ecotourism as good concepts and a prospective industry. The comments reflect their trust in the prospects of tourism, that it would develop and maintain sustainably in their area.

Tourism is one of the fastest growing industries in the globe as well as in Sri Lanka (UNDP, 2008 & SLTDA, 2011). Within the tourism industry there is a growing demand for nature friendly facilities (7%) and associated activities (20%). In this context mangrove environments have a very high potential of attracting positive attentions of
the tourism sector, particularly due to mangroves’ natural biodiversity and their richness in associated ecosystem.

**Conclusion and Policy recommendations**

Mangrove plant diversity and their geographical distribution (Table 2) offers considerable potential for the development of research centres, eco-friendly accommodations, nature trails and interpretation services by village people. Nature-based activities could include replanting mangroves with visitors and joint research projects by visitors with local youth, which could generate a variety of forms of income avenues for communities neighbouring mangroves. Initial inputs and support are required to train local personnel and technological inputs are needed to create awareness among local people to explore possibilities to introduce ecotourism initiatives. Once non-extractive direct benefits are established and communities begin to generate alternative income using mangrove as a resource base for tourism, they will start protecting mangrove to secure income and respect for mangrove as a resource. Establishment of management systems and network marketing, both nationally and internationally, will ensure sustainability of the tourism market while paving the way for conservation of mangroves in the long run in parallel with ecotourism and nature tourism.

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Ma;tdp; Nehf;fq;fs;

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Jiwf;fhd tha;g;Gf;fis fz;lwpy;j> gpuhe;jpa mgptpUj;jpia Vw;gLlj;jtpy; Rw;Wyhj;Jiw
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Kjyhk;> ,uz;lhk; epiyj; juT %yjhjhuq;fspidg; gad;gLjjp msT rhh; kw;Wk; gq;G rhh;
Ma;T Kjwfs mbg;gilahfj; nhfzh;L t;tha;thdJ Nkw;nfhs;sg;gL;Ls;sJ. Kjd;dpiyj; juTfs;
Neub mtjhdk;> tpdhf; nhjh;j> Neh; fhzy; Mfpatw;wpd; %yk; ngwg;gL;ld. Fwpq;ghf
kl;lf;fsg;G khtl;lj;jpy; fhzh;gLk; %oy; Rw;Wyh ikaq;fSt;F Fr; ndr;W Neubaf
mtjhdpj;jlk kw;Wk; mk; ikaq;fSt;F tUf je;j cs;ehl;L> ntspel;l Rw;Wyhj;
gazfpsplKk;> mg; gupNjr nghj kf;fs;> kjj; jiyth;fs;> nghj mikg;Gf;fspd;
gpujpepjfs; Nghd;NwhhpI; fUj;Jf;fs; Nfl;fg;gL;ld. mj;Jld; mg;gupNjr kf;fspkj; 100
tpdhf;nhjh;jf;fs; tqq;fg;gL;L ,t;tha;Tf;F Njitaahd Kjd;dpiyj; juTfs; ngwg;gL;Ls;sd.
,uz;lhk; epiyj; juTfs; Rw;Wyh njhI;ghd E}y;fs;> rQ;rpiff;s;> ,yl;if Rw;Wyh rIg;
Rw;Wyh mgptpUj;jp mjphu rIg; Rw;Wyh mikr;Rf;fs; %yk; ntspagl;gL;L
cc;jjpNahfg+h;tkhd Mtzq;fs;> mwpf;iff;s;> izaj;jsq;fs; kw;Wk; gjjphpiff; fl;LiuF;
%ykK; ngwg;gL;L tptuzg; Gs;sptqutpay; Kiw %yk; gFg;gah;T nra;ag;gL;L KbTfs;
ngwg;gL;Ls;sd.

Ma;tdp; KbTfs;
Sustainable Mobility


Ffghyd.; fh> (2004) > “yq;ifapd; Rw; Wyhf; ifj; njhopy; Jiwapd; mz; ikf; fhyg; Nghf; Ffs;” > aho; g; ghzg; Gtpapayhsd; Gtpapaw; Jiw aho; g; ghzy; fiyf; ofk; jo; 16-17> 71-81.

Rje;jpu , yq; ifapd; nghUshjhu Kd;Ndw; wk; (1998) > “Rw; Wyh” , yq; if kj; jpa tq; fp> 204-211.

[atpf; uk. N[. vk.; V] ([Pd; Mf]; l; 2000) > “Rw; Wyhf; ifj; njhopy;” > nghUspay; Nehf; F> kf; fs; tq; fp> kyh; 26> 2-29.

kNdh[; Fkhh; mfh; th; Fzrpq; f. Nf. IP. v]; B. (khrp-gq; Fdp> 2011) > “Rw; Wyhj; Jiw” > nghUspay; Nehf; F> kf; fs; tq; fp> kyh; 36> 3-44.

,yq; if kj; jpa tq; fp Mz; lwpf; if> (2006) > “gj; jhz; L fhy mgptpUj; jpf; fl; likg; G 2006-2016” > 18-23.

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Public, Private and People Partnership (PPPP) for Manpower Development of the Tourism Industry in Sri Lanka

D A C Suranga Silva,
Senior Lecturer, Department of Economics, University of Colombo

Key words: Tourism Manpower Development; Private and Public Partnership; Accreditation and Franchising; Tourism Research, Policy Designing and Planning; University Contribution

Introduction

Sri Lanka, a country which had a thirty-year horrendous war, enjoyed permanent peace since 2009. Being one of the most peace-benefited industries, Sri Lanka tourism has started rekindling its position back as one of the top best destinations in the world. As a result, Sri Lanka has now been recognized as one of the sought after destinations in the world recently (New York Times, 10th January 2010).

Having identified the multiple contribution of tourism industry on socio-economic development in Sri Lanka, Mahinda Chinthana Development Framework expects to increase international tourist arrivals to 2.5 million while increasing tourist receipts to USD 2500 million by 2016.

As being a labour intensive industry, one of the critical factors to determine whether Sri Lanka could achieve the expected targets in tourism industry is the availability of skilled manpower for tourism development in Sri Lanka. It is expected to increase up to 500,000 trained human resources by 2016 to satisfy the manpower requirement of the industry at which time it reaches 2.5 million tourist arrivals.

The major challenge is how to provide the required 500,000 human resources while ensuring quality of such manpower. Service attraction of the industry is mainly determined by the availability of high quality trained manpower to the industry. Ironically, majority of tourism employment opportunities available in Sri Lanka are currently representing low-wage, low-skilled, low paid, temporary and seasonal jobs. A very small segment in tourism employment seeks high quality trained skills and competencies.

Therefore, the objective of this study is to examine how effectively helpful public and private partnerships to meet the emerging manpower requirement of Sri Lanka tourism industry by 2016.
Methodology and Data

This study has employed a mix of both Descriptive and Exploratory Research methods. The study carried out a field survey while reviewing the available secondary data published by related institutes and organisations. Travel Agencies and Air Lines, Accommodation Sector, both public and private training institutions, government and non-government tourism organisations and other related institutions were included into this survey. Both primary and secondary data sources were used to collect necessary information for the study.

Findings and Conclusions

According to the findings of this study, a severe deficit of manpower at managerial levels, much more than at operative level, is likely to be experienced in the future. This will be due to the high demand for experienced and skilled employees by star graded internationally recognized hotel chains. In this context, strategies to provide the required manpower for the tourism industry cannot be effectively implemented by public sector or private sector alone. A proper coordination between both sectors and quality assurance monitoring system are needed. Tourism service providers, government, tourism education and training institutes and community organizations, must work together aiming at well focused targets through a process of Public, Private and People Partnerships (PPPP).

These four stakeholders are:

1. Tourism Service Providers (e.g. Hoteliers, travel agency operators, guides etc.)
2. Government Authorities and Organizations such as SLTDA, SLITHM, SLTPB, SLCB, the Ministry of Economic Development, and provincial level tourism authorities
3. Tourism Education and Training Institutes/Universities
4. Community Members and Community Organisations

Furthermore, such partnerships must ensure (1) Developing partnerships among vocational training institutes, universities and high educational institutes; (2) Introducing of accreditation and franchise operations; (3) Introducing new training programmes by addressing the emerging requirements of tourism manpower; (4) Provide Train the Trainers Programmes and (5) Conducting effective awareness programmes through the collaboration of national and regional educational institutes and related community organisations.
These key strategies must be incorporated with an effective community participation to provide required manpower for the industry. Contribution of community members and related organisations are vital in developing positive attitudes among youths to engage with the industry as employees or resource persons. The industry’s direct partnership with community members and related organisations is a must in this context.

Developing partnership between internationally recognised tourism manpower training institutes and universities will provide opportunities to gain exposure to international training programmes. This could also provide an opportunity to understand industry practices at international level.

One of the key challenges found in this study is the maintaining quality and standards of training programmes conducted by private sector institutes. Usually, it was public sector training programmes on quality and standards which were considered outdated and less market demand driven. As at present, such situations can often be seen with many private sector training programmes as well. Developing quality and standards training programmes through private sector participation is to be done with a properly coordinated mechanism.

The study also revealed that the expected role of universities by the industry is completely different to what the majority of Sri Lankan national universities are currently offering to the industry. Instead of providing technical training for the craft level manpower development to the tourism industry, they are expected to provide...
training for higher managerial levels, conduct necessary research activities and to design policies and plans for the development of the industry. Therefore, identifying right educational programmes and designing them to suit demands of the industry becomes important. Universities must conduct appropriately developed programmes at right times and with right qualities.

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Integrated Decision Support System for the Provision of Optimum Rural Mobility Solutions:  
A Conceptual Framework using Mobility Biographies

Granie R Jayalath  
Faculty of Graduate Studies, University Of Colombo, Sri Lanka

Key words: Rural mobility, modal splits, life style domains, mobility biographies, knowledge bases.

Introduction

The efforts of governments of many developing countries and donor agencies to improve rural mobility have so far been focused on improving and expanding road infrastructure networks. Over the many years there has been massive spending on rural road provisions, yet the interventions have not effectively resolved the rural mobility burden, particularly in developing countries. Though rural populations are quite large, generally exceeding 70% of total populations in developing countries and characterized by low motorised vehicle ownership, the planning philosophy followed by local executing authorities remains auto-mobile dependent.

In the context of Sri Lanka, if the current school of thought is allowed to continue i.e. provision only of paved accessibility as the sole solution to resolve the rural mobility burden, the ongoing program which commenced in 2005, with an annual paving rate of approximately 530km per year (assuming a liner trend) will need another 122 years to have the whole rural network (64,660km) to be paved. Further the planning philosophy which is auto-mobile dependent has not yet explored the potential benefits of already available alternative modes including non-motorised and intermediate modes (Granie R, Kumarage A, 2011). As such current rural mobility solutions are not optimized, hence not commensurate with the existing demand and supply parameters.

Martin L (2003) modified the life course theory of Salomon I (1983) by adding temporal dimension, and distinguished three life style domains with the objective of understanding the travel behavior of an individual. The version of Martin L (2003) was modified again by the author (Granie R.J.,2011) and distinguished four life style domains to simulate the total longitudinal trajectories in the mobility domains of rural village commuters. Estimation of demand for mobility by income groups by the year of analysis is carried out by mapping mobility biographies of the four life style domains thus distinguished based on age groups.
Further an approach is presented to model “mode choice decisions” to have initial estimates for demand by modes in the future year of analysis. Matching interventions to suit the projected demand are determined by referring to knowledge bases, and optimum options are selected based on an appropriate benefit/cost (B/C) tool.

This paper presents a conceptual decision support framework based on an integrated approach to facilitate arriving at optimum decisions over the provision of rural mobility solutions. Research findings could be used to formulate an evidence based national policy framework for rural mobility provision in developing countries in general, and in particular for Sri Lanka.

**Objectives**

The main objective is to develop a conceptual decision support system (DSS) based on an integrated approach to facilitate the estimation of rural mobility demand and to derive optimum mobility solutions for a future year of analysis. To achieve this objective the following specific objectives were formulated.

a. Develop an appropriate methodology to estimate the demand for mobility (total # trips) by village commuters by the future year of analysis

b. Develop an appropriate methodology to model mode choices by the future year of analysis

c. Compile available global, local and location specific knowledge bases on recommended solutions for mobility demand by different modes.

d. Derive a set of matching mobility interventions to suit the projected trips by modes making reference to the knowledge bases.

e. Selection of optimum mobility intervention(s) based on an appropriate Benefit-Cost analytical tools.

f. Validation of the model outputs

**Methodology**

Methodological framework was developed to achieve the specific objectives stated above. Brief outline of the conceptual decision aid system is illustrated in figure 1.

Figure 2 illustrates the process of mapping the mobility biography of a life style domain (example - “employed (25Y-60Y)” under the low income category).
Modeling mode choice decisions is carried out to arrive at initial estimates of demand by modes by the year of analysis. Matching interventions to suit the projected demand by modes are determined by referring to the knowledge base. In case more than one matching solution is found a benefit cost analysis is carried out to select the optimum solution.

To validate the model outputs, model is applied to a village and model derived solutions are compared with already existing solutions in terms of benefits and costs.
Figure 2: The process of mapping the mobility biographies. Example, for the “low income group” using the four life styles, i.e. childhood (0-6), school hood (7-23), employ hood (24-60) & elder hood (>61)

Here, $k_{0a}$, $k_{1a}$, $k_{2a}$, are constants, $F_{1a}$, $F_{2a}$, $F_{3a}$ are independent influential variables as determined by the multivariate regression analysis. “# Trips” is the continuous dependent variable.

$F_{1ag}$, $F_{2ag}$, $F_{3ag}$ are growth functions of the independent influential variables. Growth functions are to be established by time series analysis. Accordingly total # trips of the low income group of a typical village can be expressed as $\sum$#trips (0-6) + $\sum$#trips (7-23) + $\sum$#trips (24-60) + $\sum$#trips (>61). A similar modeling process is to be carried out for “middle” & “high” income groups
Results

To illustrate the architecture of models’ major outputs, predictive abilities between variables were examined using SPSS (13) using a data set of a lifestyle domain “employed (age 25-60)” of a low income group. Initially linear models were considered.

\# Trips per week \#(Male) 6.24 + 5.38[f (Accessibility)] -0.19[f (Female)] …….equation 01

\#Trips per week (walk) = 2.7 + 2.8[f (Female)] -0.15[f (access –status)] ……equation 02

\#Trips per week (walk +Bus) =(-0.8) +1.04[f (employment)] +0.8[f (Female)] -0.3[f (accessstatus)]……………………………………equation 03

Here, f [Gender], f [Accessibility] etc, are the growth functions of influential variables.

Conclusion and Policy Recommendation

The school of thought of “Providing Only Paved Accessibility” as the sole solution to resolve the prevailing rural mobility burden, so far has not been effective and successful in developing countries in general and in particular in Sri Lanka. Decision support tools being developed so far in the context of rural mobility provision are mainly focused on providing accessibility paying significant attention to the needs of auto-mobile users while potential benefits of non-motorised and intermediate modes have not yet been adequately explored (Malczewski J., 2006).

The conceptual decision aid framework presented here based on an integrated approach could be used to formulate evidence based national policy framework for rural mobility provisions of developing countries in general and in particular for Sri Lanka.

References


