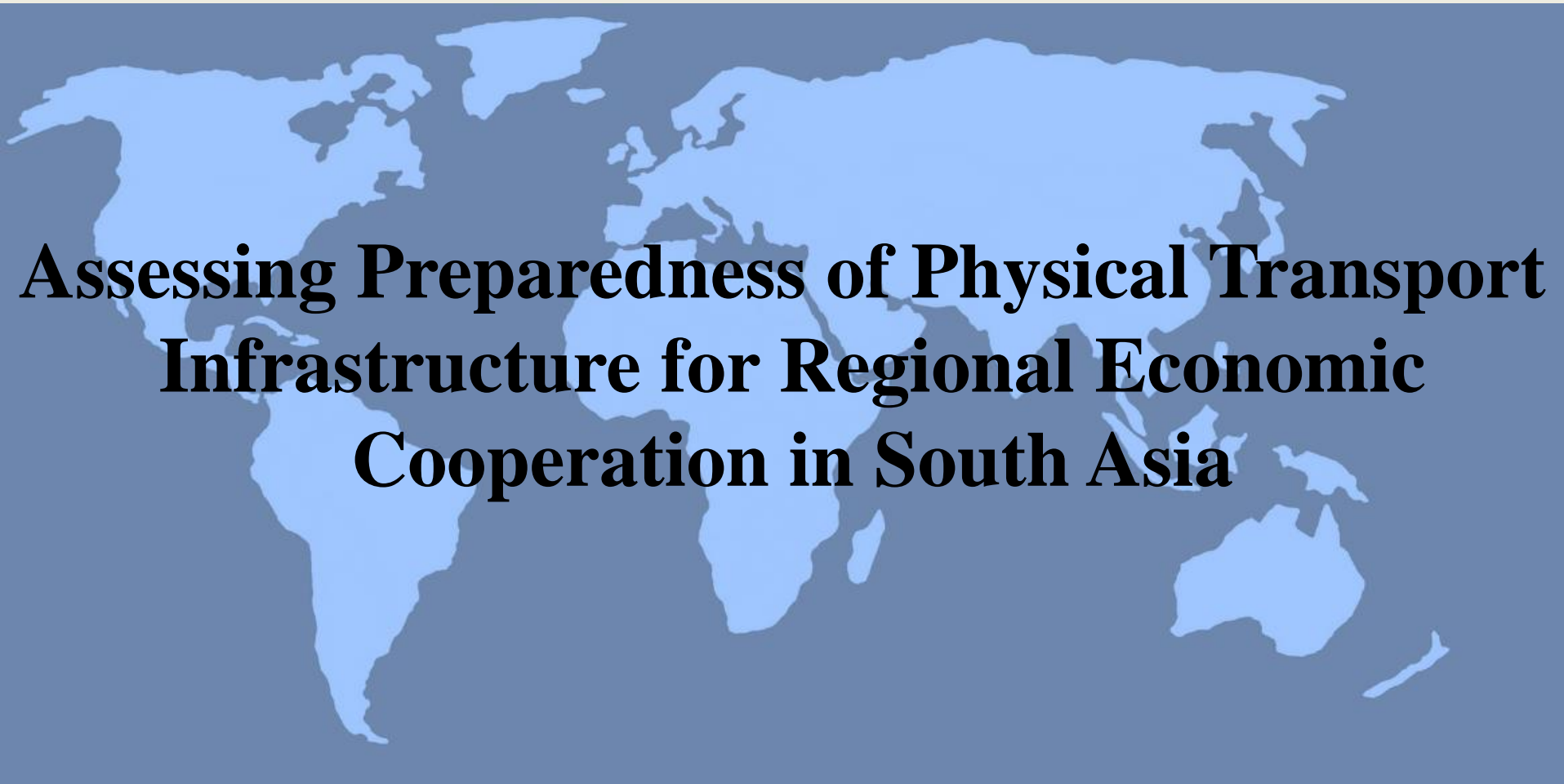


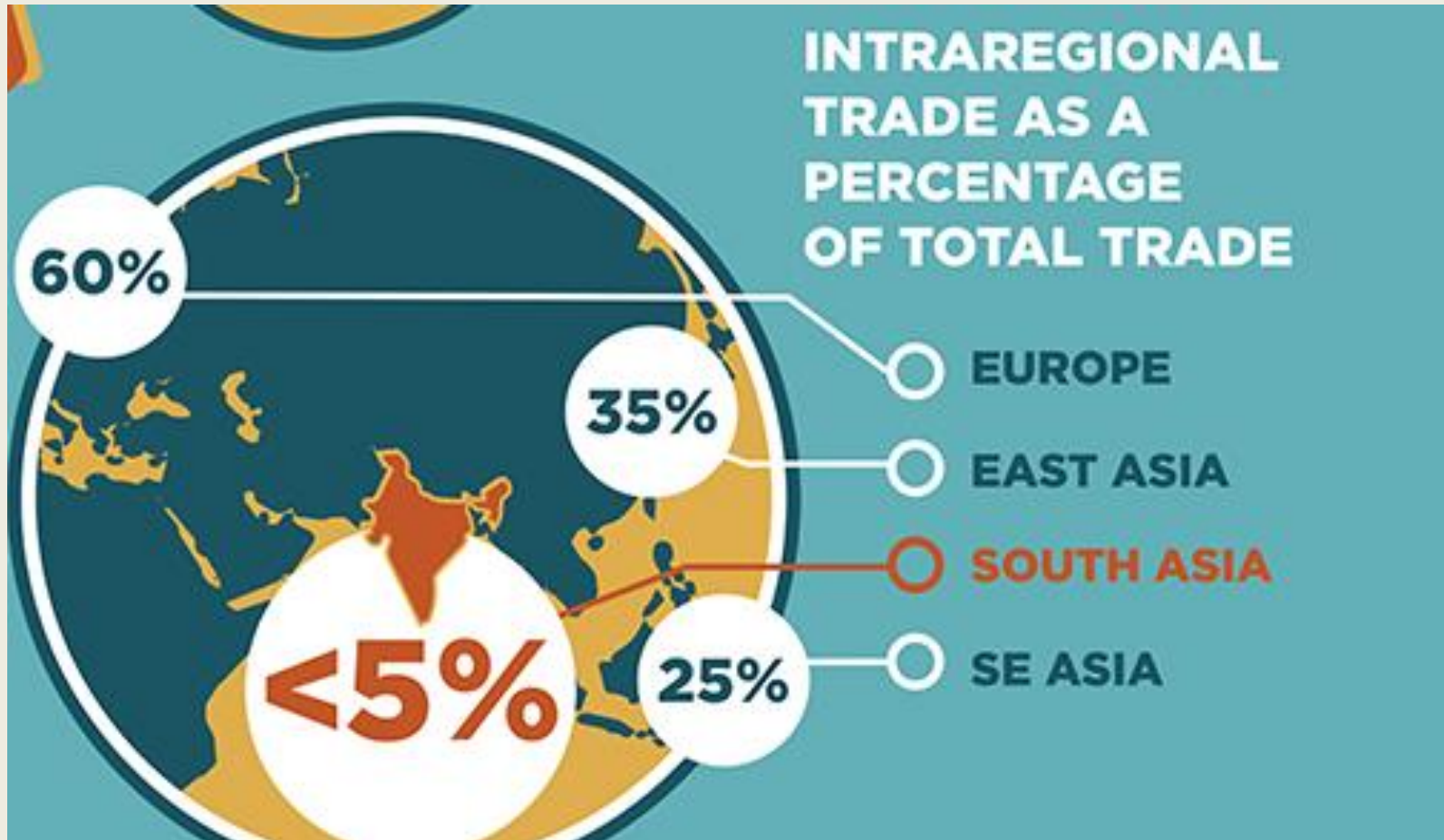
SANEM ANNUAL ECONOMISTS' CONFERENCE 2017

Theme: Trade and Regional Integration



**Assessing Preparedness of Physical Transport
Infrastructure for Regional Economic
Cooperation in South Asia**

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UNIVERSITY OF DHAKA
BANGLADESH**





TRADE IN SOUTH ASIA

A DISCONNECTED REGION

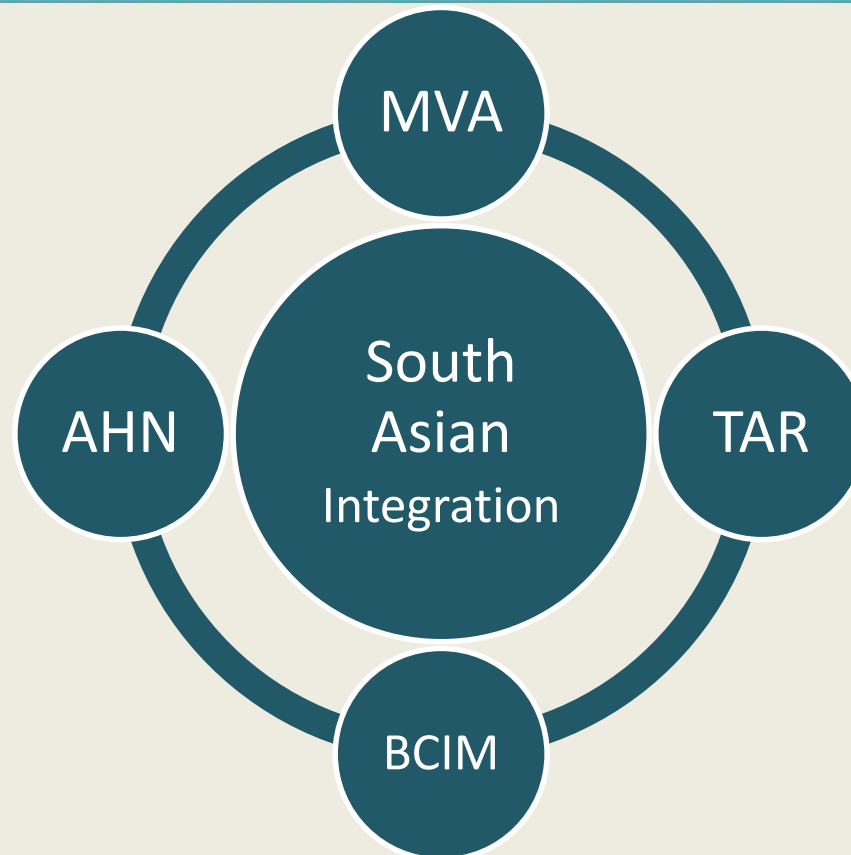
TRADING WITHIN SOUTH ASIA COSTS MORE THAN TRADING OUTSIDE THE REGION — EVEN THOUSANDS OF MILES AWAY.

20% IT'S 20% CHEAPER FOR INDIA TO TRADE WITH BRAZIL THAN WITH ITS NEIGHBOR PAKISTAN.





TRADE IN SOUTH ASIA



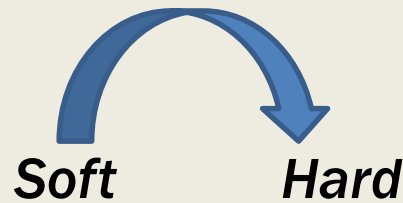
Logistics Performance Index *by The World Bank*

- based on a worldwide survey of operators on the ground
- 6 (six) components
- (only) relatable component: “Quality of Trade and Transport Infrastructure”

Global Competitiveness Index *by the World Economic Forum*

- based on surveys of executives’ opinion
- 12 (twelve) pillars
- (only) relatable pillar: “Infrastructure” which includes electricity and telecommunications

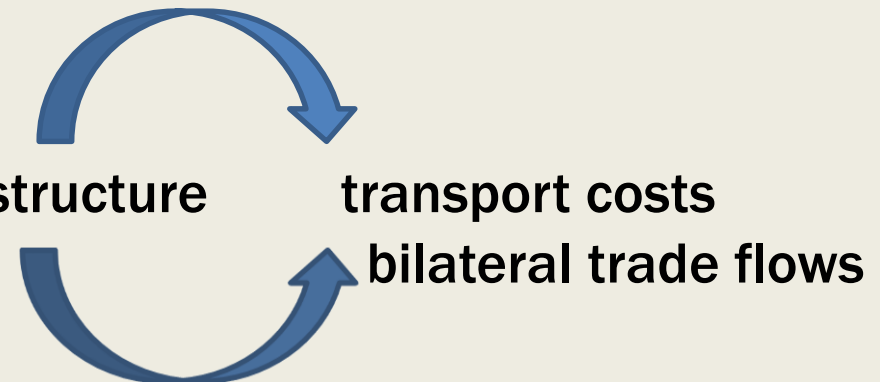
• UNESCAP (2014):



• Bougheas (1999):



• Limao and Venables (1999):



• Limao and Venables (2001):

Poor Infrastructure → 40% of transport cost for coastal countries
60% of transport cost for landlocked countries

•Rahmatullah (2010):



Logistic Costs (As % of GDP)	13-14%	8%
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•Prabir De (2014):

Global Value Chain Linkage
Economic Integration



Physical Infrastructure Issues
Soft Infrastructure Issues

“Is the physical transport infrastructure of South Asia sufficiently developed for meeting the prerequisites for regionally integrated trade?”

a. Data Source

- World Bank's latest *World Development Indicators* accessed from online databases
- The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) Statistical Database

b. Analytical Framework

- Individual Connectivity Scorecard: to gauge the robustness of physical transport infrastructure of selected countries

- 4 *indicators*, 6 components:

Road Infrastructure:

Road density

Rail Infrastructure:

Rail density

Railways, goods transported

Aviation Infrastructure:

Air transport, passengers carried

Air transport, freight

Port Infrastructure:

Container port traffic

b. Analytical Framework (continued)

- ONLY the terms found to have a significant effect on the trade volume of a country will be incorporated in the calculations
- Using panel data, the regression function can be postulated as follows:

$$\begin{aligned} \text{Total Trade Volume}_{it} = & \beta_0 + \beta_1 (gdp)_{it} + \beta_2 (investment)_{it} + \\ & \beta_3 (rail\ freight)_{it} + \beta_4 (road\ density)_{it} + \\ & \beta_5 (rail\ density)_{it} + \beta_6 (air\ passengers)_{it} + \\ & \beta_7 (air\ freight)_{it} + \beta_8 (container\ port\ traffic)_{it} + \\ & \beta_8 (tax\ on\ international\ trade)_{it} + \varepsilon \end{aligned}$$

a. Econometric Estimation

Table : Results from the Fixed Effect Regression

Independent Variables (with Total Trade as dependent variable)	Coefficient	T value	P value
Rail Density	8.69e+11	5.44	0.00
Road Density	4.70e+09	2.72	0.008
Container Port Traffic	7.12e+08	2.61	0.010
Air Passenger	1.78e+07	0.02	0.982
Air Freight	9.3e+06	1.01	0.315
Railway Freight	1.9e+05	1.60	0.114
GDP (current \$)	0.2727753	7.14	0.00
Investment	1.56e+09	0.32	0.748
Tax on International Trade	2.25e+09	0.58	0.561
Constant	-1.67e+12	-6.42	0.00

a. Econometric Estimation (continued)

Results from the Fixed Effect Regression

- Rail Density, Road density, Container port traffic and Rail Freight- have been found to have significant effect on total trade volume
- Comparatively high R^2 of 90.9 %
- The four variables found significant will be incorporated into the Individual Connectivity Scorecard

b. Individual Scorecard Formation

Step 1 : Fixing the minimum, maximum and actual values for each variable

minimum value = the value for the country which scored lowest in that particular variable

maximum value = the value for the country which scored maximum in that particular variable

actual value = the real value of the variable for a specific country for the reference year (2011)

Step 2: Apply the formula for finding the value for each variable:

Variable Index = $(\text{actual value} - \text{minimum value}) / (\text{maximum value} - \text{minimum value})$

Step 3 : Add the values of the Variable Indices to get the result

c. Individual Scorecard List for Selected Countries

Position	Country	Individual Scorecard
1	China	220.88
2	Japan	134.49
3	Singapore	121.24
4	South Korea	112.69
5	India	103.06
6	Sri Lanka	82.13
7	Russia	79.20
8	Bangladesh	78.12
9	Armenia	58.24
10	Georgia	55.61
11	Kazakhstan	50.09
12	Turkey	38.85
13	New Zealand	37.93
14	Malaysia	35.84
15	Uzbekistan	34.95

Position	Country	Individual Scorecard
16	Thailand	34.25
17	Vietnam	32.95
18	Pakistan	26.69
19	Philippines	19.88
20	Iran	19.80
21	Indonesia	19.73
22	Mongolia	18.29
23	Tajikistan	15.98
24	Brunei	11.60
25	Maldives	5.44
26	Cambodia	4.06
27	Bhutan	3.80
28	Laos	2.96
29	Nepal	2.20
30	Myanmar	0.67

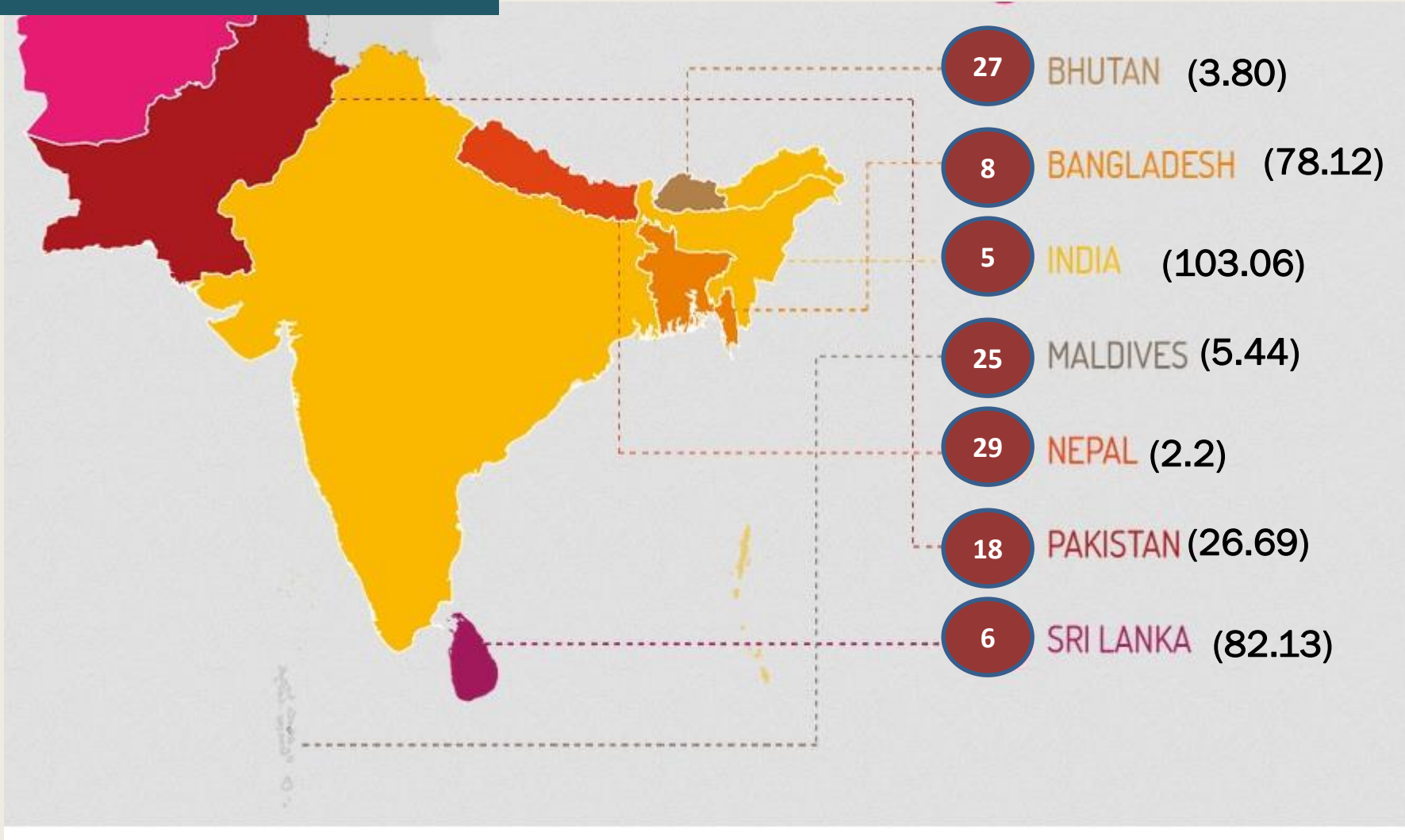
d. Significance of Individual Scorecard

$$\text{Total Trade Volume}_i = \beta_0 + \beta_1 (\text{individual scorecard})_i + \beta_2 (\text{gdp})_i + \beta_3 (\text{investment})_i + \beta_4 (\text{tax on international trade})_i + \varepsilon$$

Table: Results from Cross-sectional Regression

Independent Variables (with Total Trade as dependent variable)	OLS Results Coefficient	T value	P value
Individual Scorecard	3.97e+09	3.01	0.006
GDP	0.1116919	1.80	0.086
Investment	.6412426	3.86	0.001
Tax on International Trade	-9.40e+09	-1.84	0.087

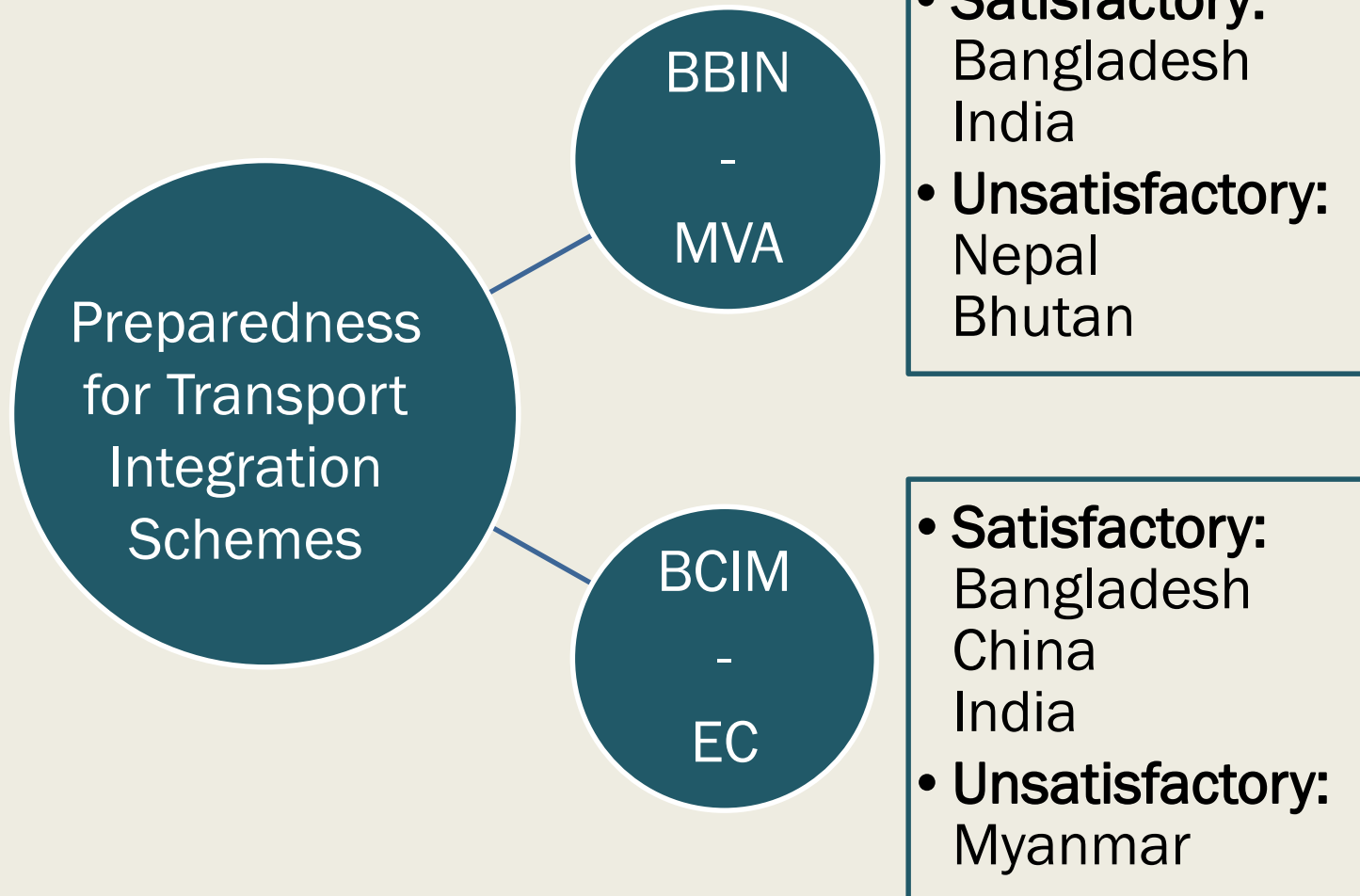
e. Interpretation: South Asian Countries' Scores



e. Interpretation: South Asian Countries' Preparedness

1. India, geographically positioned as a common node, appears to be well-prepared.
2. Bangladesh and Sri Lanka appear to be relatively well-positioned for future integration efforts.
3. The internal transport infrastructures of Nepal, Bhutan and Pakistan, countries dominated by mountain ranges and highlands, require considerable improvement.
4. The landlocked Himalayan countries are to benefit the most from multimodal, regionally integrated transport schemes.

e. Findings



1. In order to get a summary view of a country's infrastructure level
2. For observing the trend in a country's infrastructure development
3. For making a succinct comparative analysis among countries
4. In formation of a new scorecard –the **“Bilateral Connectivity Scorecard:**

The bilateral connectivity scorecard will take into account the following:

- (Individual) Connectivity Scorecards
- Number of land ports (shared)/ Transit agreements
- Number of airports (with direct air links between capitals or major cities)
- Number of sea ports (with direct links)

1. Methodology can be applied in calculating the scorecards for worldwide regional blocs and groups of adjacent nations
2. Summary scores can be utilized as key data in socio-economic studies in order to explore correlations between trade, connectivity and overall development indicators

Overall Summary

1. China is on top of the list with a score of 220.88 out of 400
2. Myanmar with the lowest score
3. Three of the bottom five countries are landlocked
4. Apart from India, Bangladesh and Sri Lanka, all the SAARC nations performed poorly

Policy Implications

1. Facilitating Multimodal Transport for Landlocked Nations
2. Initiating Cross-National Planning of Infrastructure Development
3. Exploring Non-traditional Sourcing of Funds

Thank You

1

- Only the **quantitative** elements of physical transport indicators considered

2

- No scope for measuring **quality** and **condition**

3

- **Exclusion** of many countries