

Regional Cooperation for Infrastructure Development: Towards an Institutional Framework for Investment in the IOR-ARC

by

**S. K. Mohanty
Priyadarshi Dash**

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Zone 4B India Habitat Centre, Lodi Road, New Delhi-110003

Tel : +91-11-2468 2177-80 ; Fax : +2468 2175/73

Email : skmohanty@ris.org.in

<http://www.ris.org.in>

CONTENTS

1. Introduction	5
2. Macroeconomic Performance	7
3. Infrastructure and Growth: Regional Experiences	11
3.1. Economic Impacts of Infrastructure	11
3.1.1. Impact on Growth.....	11
3.1.2. Other Economic Impacts	13
3.2. Importance of Infrastructure in Regional Integration	14
3.2.1. Emergence of RPN and Demand for Regional Infrastructure	14
3.2.2. Physical Integration as Catalyst to Economic and Political Integration	15
3.2.3. Regulatory, Institutional and Implementation Issues	15
3.2.4. Role of Governments	16
3.2.5. Reform in Infrastructure Sectors.....	17
3.2.6. Public-Private Partnership	17
4. Sector Overview and Policy Environment	18
4.1. Road	18
4.2. Power	20
4.3. Ports	21
4.4. Railways.....	23
4.5. Information and Communication Technology	26
5. India's Outward Infrastructure FDI in IOR-ARC Countries.....	27
6. Infrastructure Finance	32
6.1. Type of Financing	33
6.2. Public Financing of Infrastructure Projects	33
6.3. Regional Financing Mechanisms	34
6.4. Role of Multilateral Development Banks	36
7. Lessons from Other Regional Initiatives on Infrastructure	44
7.1. TEN-T Projects in European Union	46
7.2. Initiative for the Integration of Regional Infrastructure in South America	48
7.3. Infrastructure Initiatives in Asia	50
7.4. Asian Highway	50
8. Institutional Framework for Regional Infrastructure Development in the IOR-ARC Region	51
8.1. Tier I	51
8.1.1. Institutional Framework	51
8.1.2. Financing	51

8.1.3. Sectors.....	53
8.1.4. Linkages	53
8.2. Tier II	54
8.2.1. Institutional Framework	54
8.2.2. Financing	54
8.2.3. Sectors.....	54
8.2.4. Linkages	54
8.2.5. Technical Committee	55
8.2.6. Finance Committee.....	55
8.3. Tier III	56
8.3.1. Institutional Framework	56
8.3.2. Financing	56
8.3.3. Sectors.....	57
8.3.4. Linkages	57
8.4. Tier IV	57
8.4.1. Institutional Framework	57
8.4.2. Financing	57
8.4.3. Sectors.....	58
8.4.4. Linkages	58
9. Conclusions and Policy Recommendations	59

Annexures

1. Introduction

Infrastructure plays a key role in promoting economic growth and development. A healthy stock of infrastructure helps build productive capacity in the economy by bridging connectivity gaps, reducing trade costs, and facilitating faster communication between the resource-rich regions and efficient allocation of resources and services.¹ In today's integrated world with growing cross-border trade and investment flows, countries could gain enormously from regional supply chains by pooling resources (physical and human) across the region which may expand market access, create more employment and address demand-supply mismatches in regional factor markets. In that perspective, the IOR-ARC appears to be a good candidate for deepening a regional scheme of integration in trade, investment and other areas of mutual interests. The IOR-ARC Charter and many of its ministerial and official meetings have envisioned a comprehensive agenda for regional cooperation that range from maritime security to fisheries, tourism and infrastructure.

Infrastructure is considered as a priority sector for investment in the IOR-ARC region. Due to low domestic savings most of the member states in the region are quite dependent on foreign investment for capital formation.² Interestingly, FDI flows to the region is growing in the recent years, thereby raising the prospects of higher investment in infrastructure. Besides investment in infrastructure projects, the region possesses enough scope for sharing and collaborating skills, expertise and trained human resources in design and execution of regional infrastructure projects.

In view of its importance to economic growth, it is imperative to undertake an in-depth study on infrastructure investments particularly with respect to the potential sectors and sub-sectors, institutional mechanism for promoting investment, and the modalities for sharing capacity and technical expertise in project conception, financing and implementation. This Report aims to fill this vacuum and contribute to the ongoing work on regional economic cooperation in the IOR-ARC region from the broader perspective of infrastructure-growth linkages.

The structure of Report is as follows. Section 2 provides an overview of the infrastructure sectors in the IOR-ARC countries. As the rationale for promoting infrastructure investment is strongly rooted in the growth-enhancing role of physical infrastructure, Section 3 covers a brief review of literature on the link between infrastructure and growth. Section 4 presents the features of infrastructure policy and regulations pertaining to different infrastructure sectors such as roads, railways, ports, power, and information and communication technology. Over the years, India has invested in several infrastructure projects in the IOR-ARC countries. In this context, Section 5

makes an assessment of the trends in India's outward infrastructure FDI in the region in the 2000s. Section 6 devotes special focus on the issue of infrastructure financing particularly the sources of financing, financing instruments and the necessary modalities involved in mobilizing finance for regional infrastructure in the public and private sectors. Since the region as a whole does not have any formal policy on infrastructure development till date, it is worth looking at the experience of other regions in conception, financing and execution of regional infrastructure projects. In this regard, Section 7 covers a synoptic view of the lessons drawn from other regional initiatives on infrastructure. Building on the understanding developed in the previous sections, Section 8 presents a regional institutional framework for infrastructure investment in the IOR-ARC region. Finally, Section 9 lists the recommendations of the study and identifies further scope of the study.

2. Macroeconomic Performance

The IOR-ARC countries are characterized by diverse macroeconomic regimes and present varying degrees of synchronization with the regional business cycle. The regional economies witnessed significantly higher growth during the global boom period 2003-08 which was marked by a surge in investment, higher trade openness, prudent price management, healthy stock of reserves, and so on.³ In the high-growth period, the member states experienced a steady rise in per capita income reflecting economic prosperity in the region. Barring a few, most of the IOR-ARC countries have witnessed robust GDP growth in the 2000s. For instance, GDP growth in real terms in 2007 has increased significantly compared to 2003; notably from 6.9 per cent to 10.1 per cent for India, from 2.8 per cent to 7 per cent for Kenya, from 0.4 per cent to 6.7 per cent for Oman, from (-) 5.9 per cent to 10.1 per cent for Seychelles, and from 4.6 per cent to 9 per cent for Singapore. For the rest countries, growth rate increased at a modest rate or remained around the trend. There was a setback to this growth process due to the catastrophic slowdown prevailed in most part of the world lasting the crisis years during 2007-09 and aftermath (Table 1).

Table 1: Growth Performance of IOR-ARC Countries

Country	GDP, Constant Prices (% Change)			GDP Per Capita (Current Prices) (US Dollars)		
	2003	2007	2012	2003	2007	2012
Australia	3.1	4.6	3.6	26942.6	44639.8	67722.6
Bangladesh	5.8	6.3	6.1	403.9	520.3	818.0
Comoros	2.5	0.5	2.5	564.8	744.3	865.1
India	6.9	10.1	4.0	549.1	1015.9	1491.9
Indonesia	4.8	6.3	6.2	1091.2	1897.6	3592.3
Iran	8.1	6.4	-1.9	2041.7	4312.1	7211.2
Kenya	2.8	7.0	4.7	456.0	748.7	976.5
Madagascar	9.8	6.2	1.9	310.4	373.1	451.5
Malaysia	5.8	6.3	5.6	4352.4	7121.8	10304.2
Mauritius	6.0	5.9	3.3	4756.7	6160.4	8850.2
Mozambique	6.5	7.3	7.5	248.3	399.3	650.1
Oman	0.4	6.7	5.0	8529.1	15369.4	24764.6
Seychelles	-5.9	10.1	2.8	8524.9	12155.7	11226.2
Singapore	4.6	9.0	1.3	23029.4	36753.7	51161.6
South Africa	2.9	5.5	2.5	3656.1	5909.6	7506.6
Sri Lanka	5.9	6.8	6.4	982.3	1624.2	2872.6
Tanzania	6.9	7.1	6.9	313.6	409.7	599.2
Thailand	7.1	5.0	6.4	2261.3	3917.9	5678.5
UAE	16.4	6.6	3.9	35017.3	57468.0	64840.3
Yemen	3.7	3.3	0.1	597.8	971.3	1377.0

Source: IMF WEO Database, April.

With respect to resource mobilization, the IOR-ARC countries are found quite sound in managing their domestic resources. Saving and investment rates broadly match for most countries except a few aberrations for some countries. In 2007, gross saving rates were substantially higher for Bangladesh (35.7 per cent), India (36.6 per cent), Malaysia (38.8 per cent), Oman (36.5 per cent), Singapore (48 per cent) and Thailand (33.4 per cent). Unlike these economies, a number of member countries face acute saving constraint. Those include Mozambique (6.5 per cent), Kenya (15.4 per cent), South Africa (14.1 per cent), Tanzania (16.2 per cent) and Yemen (10.2 per cent). This asymmetric distribution of savings in the region warrants the need for a regional mechanism of pooling savings in order to meet the growing demand for investment in infrastructure and related sectors. This appears to be consistent with the prevailing investment rates in the IOR-ARC countries. For some members, savings rates are above the investment rates implying surplus resources at their disposal which could be deployed in the region for building physical infrastructure and for meeting necessary development expenditure. These include Bangladesh, Malaysia, Oman, Singapore and Thailand. A similar pattern is noticed for investment rates in the region (Table 2).

Table 2: Savings and Investment Rates in IOR-ARC Countries

Country	Gross Savings (% of GDP)			Gross Capital Formation (% of GDP)		
	2003	2007	2011	2003	2007	2011
Australia	20.8	22.3	-	25.7	27.9	26.7
Bangladesh	30.0	35.7	36.5	23.4	24.5	25.2
Comoros	-	-	-	10.3	11.2	-
India	28.3	36.6	-	26.2	38.0	35.4
Indonesia	29.9	26.0	31.8	25.6	24.9	32.8
Iran	-	-	-	36.3	33.2	-
Kenya	15.2	15.4	13.5	16.5	19.1	21.2
Madagascar	13.0	-	-	17.9	32.4	-
Malaysia	34.9	38.8	34.6	22.8	23.4	23.6
Mauritius	25.3	22.1	13.8	23.6	26.9	25.4
Mozambique	4.1	6.5	12.4	22.3	16.1	24.3
Oman	29.1	36.5	-	22.3	30.6	-
Seychelles	-	-	-	-	-	-
Singapore	39.0	48.0	-	16.1	22.3	22.4
South Africa	15.7	14.1	16.4	16.7	21.3	19.7
Sri Lanka	21.3	23.6	22.1	21.6	28.0	29.9
Tanzania	18.2	16.2	20.3	19.2	29.6	36.7
Thailand	28.3	33.4	-	25.0	26.4	26.6
UAE	-	-	-	21.4	23.8	-
Yemen, Rep.	22.1	10.2	-	20.7	17.2	-

Source: World Development Indicators Online.

Table 3: Infrastructure Indicators in IOR-ARC Countries (2010)

Country	Air transport, freight (million ton-km)	Container port traffic (TEU: 20 foot equivalent units)	Electric power consumption (Billion kWh)	Electricity production (Billion kWh)	Fixed broadband Internet subscribers (per 100 people)	Internet users (per 100 people)	Mobile cellular subscriptions (per 100 people)	Rail lines (total route-km)	Railways, goods transported (million Country ton-km)	Road density (km of road per 100 sq. km of land area)	Telephone lines (per 100 people)
Australia	2380.4	6536490.8	227.0	241.5	23.2	75.9	101.0	8615	64172	10.7	47.6
Bangladesh	84.6	1356099.0	41.5	42.3	0.0	3.7	46.2	2835	710	14.8	1.0
Comoros	-	-	0.0	0.0	0.0	5.1	22.5	-	-	-	2.9
India	1720.2	9752908.0	754.6	959.9	0.9	7.5	61.4	63974	600548	-	2.9
Indonesia	659.7	8371058.1	153.8	169.8	1.0	10.9	88.1	-	-	-	17.1
Iran, Islamic Rep.	131.4	2592522.0	196.2	233.0	1.3	16.0	73.1	6073	20247	11.4	34.9
Kenya	257.7	696000.0	6.3	7.5	0.0	14.0	61.6	-	-	10.7	0.9
Madagascar	21.9	141093.0	0.0	0.0	0.0	1.7	37.2	-	-	6.4	0.7
Malaysia	2450.8	18247031.9	116.9	125.3	6.5	56.3	119.2	1665	1384	43.7	16.1
Mauritius	179.3	444778.0	0.0	0.0	6.1	28.7	91.7	-	-	-	29.8
Mozambique	8.1	223289.0	10.4	16.7	0.1	4.2	30.9	3116	695	-	0.4
Oman	26.8	3893198.0	16.5	19.8	1.6	62.0	165.5	-	-	-	10.1
Seychelles	16.5	-	0.0	0.0	7.3	41.0	135.9	-	-	110.4	25.5
Singapore	4003.9	29178500.0	42.2	45.4	25.0	71.1	145.2	-	-	475.6	39.2
South Africa	1107.3	3806427.0	240.1	256.6	1.5	18.1	100.5	22051	113342		8.4
Sri Lanka	329.5	4080000.0	9.3	10.8	1.1	12.1	83.2	-	-	173.9	17.2
Tanzania	2.3	426847.0	3.5	4.4	0.0	11.0	46.8	-	-	-	0.4
Thailand	3132.8	6648532.0	155.1	159.5	4.6	22.4	103.6	4429	3161	-	10.0
UAE	10126.0	15174022.9	83.0	97.7	10.5	68.0	145.5	-	-	-	19.7
Yemen	28.2	370382.0	6.0	7.8	0.3	12.4	46.1	-	-	-	4.3

Source: World Development Indicators Online.

At present, the state of infrastructure in the region is quite disparate and fragmented. Road and rail infrastructure throughout the region is at different levels of development. Except Singapore and Sri Lanka, road density for other member states varies in the range between 5 km to 50 km per 100 square km of land area. Likewise, rail lines and goods transported by railways show wide differences across the region. With regard to air transport freight, the volume of air freight is higher for the large and relatively developed member states with a minimum of 1,107.3 million ton-km for South Africa and the maximum of 10,126 million ton-km for the United Arab Emirates. On the other hand, the level of air traffic is much lower for a sub-group of countries including Madagascar, Mozambique, Seychelles, Tanzania, and Yemen. In contrast, the volume of container traffic is substantial for many of these IOR-ARC countries. The large countries seem to have outperformed others in other infrastructure indicators such as electricity production and consumption, internet subscription and use, and mobile telephony (Table 3).

3. Infrastructure and Growth: Regional Experiences

Infrastructure, both in hard and soft form, serves as a key enabling factor in intra- and inter-regional resource allocation and promotion of economic activities. Lack of adequate access to physical infrastructure such as roads, railways, ports and logistics is often highlighted as a major impediment to trade, investment and cross-border mobility of labour. In that perspective, the efficient provision of infrastructure facilities and services is of paramount importance. The positive impacts of improved infrastructure, logistics and streamlined customs procedures are manifested in reduced trade costs, shorter transit time and cost-effective relocation of production centres both within the national borders and across the region. Notably, the emergence of regional production networks has expanded the scope for trade in parts and components thereby the need for building and maintenance of fast, reliable and sophisticated infrastructure facilities.

3.1. Economic Impacts of Infrastructure

3.1.1. Impact on Growth

The two-way causality between infrastructure and economic growth could be established both theoretically and empirically. Theoretically, a healthy stock of physical infrastructure facilitates efficient resource allocation by reducing transaction costs and enabling consumption and trade of goods and services across major centres of production and consumption in a region. The potential contribution of physical infrastructure particularly road and railways to growth could be higher in remote and inaccessible areas that are delinked from the mainstream economic hubs. At the same time, sustained growth in any region necessitates improvement in physical connectivity and enabling infrastructure services.

Empirical evidence on the link between infrastructure and growth provides mixed results on both directions of causality. Whether infrastructure stock is low in resource-scarce regions or not, it is likely that these regions miss the link with the mainstream core⁴ and witness low scale of economic activity. The positive and significant relationship between infrastructure stock and growth has been empirically observed for different groups of economies (ECLAC-UNASUR, 2012; Castells and Sole-Olle, 2005; Esfahani and Ramirez, 2003; Caledron and Serven, 2004; Fedderke, Perkins and Luiz, 2006; Kumo, 2012). On the supply side, infrastructure increases factor productivity and brings down production costs whereas on the demand side higher economic growth creates more demand for infrastructure assets and services (ECLAC-UNASUR, 2012). In the presence of economies of scale, network externalities and competition-

enhancing effects, infrastructure exerts a robust positive impact on growth (Egert, Kozluk and Sutherland, 2009). Moreover, higher accumulation of infrastructure is associated with higher growth (Seethapalli, Bramati and Veredas, 2008). Many growth accounting exercises identify the positive contribution of infrastructure to total factor productivity in the poorer countries.

Although many empirical studies establish a direct causal relationship between infrastructure and growth, the effect could differ widely for different types and forms of infrastructure assets and services (Brooks and Go, 2011). Basically, investment in infrastructure is found highly concentrated in relatively less risky sectors such as telecommunications than in other sectors such as water, sanitation, education, and so on. Whether it is due to low risk or not, investment in telecommunications has generated externalities and contributed positively to growth (Straub et al., 2008). Further, a large part of variation in growth performance is explained by the differences in geographical locations, transport and telecom infrastructure (Demurger, 2000). Besides telecommunications, the other sector that attracts higher investment is electricity. Investment in electricity is found positively related to long-term growth (Egert, Kozluk and Sutherland, 2009). Likewise, road has a strong positive impact on total factor productivity (Straub et al., 2008).

In addition to positive growth effects, interventions for infrastructure development have significantly lowered income inequality and contributed to a virtuous cycle of income generation and poverty alleviation. Further, the strength of this effect is influenced by country income levels and quality of governance. Although infrastructure development has been the exclusive monopoly of the public sector, the private sector is not completely inimical to investment in infrastructure sectors. In fact, private investment contributes to growth and private sector participation is crucial for encouraging infrastructure investment in the emerging economies (Kateja, 2012).

Very often, the empirical link between infrastructure and growth varies considerably depending on the underlying econometric modeling used in the studies. Besides conventional production function-based approaches that include infrastructure capital and services as inputs, the recent studies on this subject are built on the foundations of 'new economic geography' paradigm. Following this paradigm, better infrastructure services create enabling environment for industries to cluster in certain locations that, in turn, could raise production and exports, hence higher economic growth. Most of those studies support the hypothesis that infrastructure acts as a supply side factor in explaining economic growth. At the same time, there are studies that highlight the possible reverse causation between growth and infrastructure. By that logic, high growth momentum in the initial period creates a virtuous cycle of spillover effects that requires additional investments in physical infrastructure facilities and logistics services in the subsequent periods. The impact of

infrastructure on output is both direct and indirect. It is likely that a rise in the quality of infrastructure stock could contribute to economic growth through factor accumulation. By that logic, it is empirically difficult to isolate the own effects of infrastructure on growth. It essentially means addressing the issue of endogeneity between infrastructure variables and growth indicators. Regardless of those empirical dichotomies, there exists sufficient economic logic in examining the potential linkages between infrastructure and growth.

3.1.2. Other Economic Impacts

While the impact of infrastructure on growth is mixed, infrastructure continues to remain a priority in the development strategies of the developing and underdeveloped countries. In order to develop a holistic view on the economic effects of infrastructure, it is necessary to disentangle the importance of several non-economic mediating factors such as institutional reforms, regulatory capacity, private sector participation, macroeconomic stability and financing options so as to measure the sole impact of infrastructure on the economy, and the society at large. The desired social outcome of infrastructure development depends very much on the interplay between these factors (Stone, 2008). In this context, two things need worth mention here. Firstly, the demand for better infrastructure facilities in Asia has grown tremendously in response to high economic growth in the past two decades. Secondly, growth in urban population has intensified pressure on transport, water and sanitation systems. These two forces signify the urgency of devising suitable policies on infrastructure that take into account the costs and benefits associated with infrastructure development (Stone, 2008).

Transport and logistics support determine the sustainability of decentralized production systems. Some of the East Asian economies have invested heavily in industrial and social infrastructure to improve connectivity within networks and with external markets as demanded from time to time (Kuroda, Kawai and Nangia, 2007). It is evident from Thailand, Indonesia, Philippines and Malaysia that infrastructure deficiencies affect economic performance. In a regional context, infrastructure development particularly the regional rail and road corridors have been given priority in several regional integration schemes. In Asia, the Asian Development Bank (ADB) has steered and financed a number of regional infrastructure projects in the past and a few are already in progress. As per an estimate, Asia lags behind other regions in terms of the level of infrastructure investments. During 2000-05, developing economies in the Asia-Pacific region spent only US\$1.7 billion on investment and maintenance of container ports. With growing demand for infrastructure financing, the regional development banks have expanded the scope for infrastructure lending and modified their lending strategies towards infrastructure projects. Between 1970 and 2005, total spending on infrastructure by the World Bank has varied

between one-third and two-third of total project lending incurred in this period (Straub, 2008).

The observed trends in lending reveal that the developing countries witnessed a boom in infrastructure investments in the 1990s. The changed investment scenario was made possible by a host of factors including the privatization of state owned enterprises, weakening of natural monopolies and greater access to innovative project financing. Despite significant rise in FDI flows the developing countries face several challenges in the areas of regulatory reforms, diversification of investment portfolio (which has been dominated by telecommunications so far), strengthening institutions, and so on (Ramamurti and Doh, 2004).

3.2. Importance of Infrastructure in Regional Integration

Besides having multiplier effects on output, income and employment, infrastructure plays a catalytic role in strengthening regional trade, economic and political integration. In particular, the cross-border physical infrastructure networks in the form of transnational roads, railways, ports, airports, seaways, etc. spread over a region facilitates faster region-wide movement of factors, goods and services that in turn reduces trade costs and expands market access for regional producers. In view of the increasing participation of countries in regional trade agreements (RTAs), preferential trade agreements (PTAs) and free trade agreements (FTAs), the potential gains from investing in regional infrastructure projects is perceived to have increased significantly in the recent years. Moreover, infrastructure integration constitutes an integral part of many regional integration schemes such as ASEAN, SADC, CARICOM, and UNASUR.

3.2.1. Emergence of RPN and Demand for Regional Infrastructure

The economic rationale for building or participating in cross-border infrastructure assets in key sectors is no more confined to the traditional paradigms of economies of scale and indivisibility. The growing phenomenon of production fragmentation and emergence of regional value chains has made it possible for the developing and the poorest economies to reap the benefits of trade in parts and components which, in turn, necessitates a strong and vibrant network of physical and soft infrastructure. Many regional economic groupings have laid specific objectives and provisions for infrastructure development keeping in view the opportunities for foreign investment arising from production relocation, regional integration and regional value/supply chains. The newly industrialized economies (NIEs), the middle-income Asian economies, China and Vietnam have invested significant resources in building necessary national infrastructure to support regional production networks in Asia (Kuroda, Kawai and Nangia, 2007). It is believed that the current growth dynamics in the Asian region is inextricably related to the demand for regional

infrastructure (Zhai, 2010). With long-term growth prospects in the Asian emerging markets such as China and India, regional infrastructure could play an instrumental role in connecting the poorest economies in the region to regional production chains and spur greater regional integration. The adequate and efficient provision of infrastructure facilities and services in a regional context would help raise competitiveness, expand trade and eliminate poverty (Tomassian, 2009).

3.2.2. Physical Integration as Catalyst to Economic and Political Integration

In the realm of globalization and privatization, most economies in the world have tended to believe in the larger economic and social gains that could accrue from embracing free trade and investment beyond their national borders. Physical integration assumes importance in that process whether a particular country is part of any RTA/PTA/FTA or not. The importance of a well-knit network of cross-border physical connectivity is prominently observed in the Latin American and the Caribbean (LAC) region. By drawing inputs from the outcome of three major regional infrastructure projects executed in the LAC such as the Initiative for the Integration of Regional Infrastructure in South America (IIRSA), the Mesoamerica Project (formerly PPP) and the Caribbean Community (CARICOM), it is noticed that infrastructure integration acts as a 'silent' integration regardless of the progress in other two pillars of regional integration i.e. trade integration and political integration (Tomassian, 2009). Among other RTAs, the ASEAN member states have prioritized the efficient provision of infrastructure as a catalyst to regional integration, and has successfully undertaken a number of sub-regional and pan-Asian infrastructure projects namely the Greater Mekong Sub-region (GMS), Mekong River Commission (MRC), Brunei-Indonesia-Malaysia-Philippines East Asia Growth Area (BIMP-EAGA), Indonesia-Malaysia-Thailand Growth Triangle (IMT-GMT), Asian Highways and the Trans-Asian railway (TAR) network (Bhattacharyay, 2009).

Similarly, several initiatives are underway to improve regional infrastructure in the Southern Africa. These include the North-South Corridor investment programme, the development of Infrastructure Master Plans by SADC and COMESA, projects in ICT, energy, water supply and sanitation and a number of transport corridor projects (AfDB, 2011). For maximizing the development impact of infrastructure and related services, UNASUR calls for a review of its programmes on regional infrastructure so as to deepen physical integration in the member states in the Southern American region (ECLAC-UNASUR, 2012).

3.2.3. Regulatory, Institutional and Implementation Issues

Besides building and managing hard infrastructure, the software issues relating to infrastructure such as regulatory, institutional and bureaucratic procedures

are important in the process of regional infrastructure development. Most developing and transition economies face serious capacity gaps in addressing institutional and regulatory loopholes that seriously jeopardize the implementation of regional infrastructure projects (Tanzi, 2005; Tomassian, 2009; ECLAC-UNASUR, 2012). Software-related problems mostly pertain to project design, financing, awareness on the potential costs and benefits of cross-border projects, and asymmetry and inconsistency in regulatory policies of the member states. In that light, the three regulatory and institutional requirements that are critical for the success of regional infrastructure projects include devising the regional mechanisms for resolving conflicts in the areas of technocratic cooperation, distribution of costs and benefits, and the relevance of sector-specific initiatives (Kuroda, Kawai and Nangia, 2007).

In addition, regional infrastructure projects require a comprehensive approach which not only envisages substantial improvement in regulatory and financing aspects but also emphasizes on the manner in which infrastructure and related transport services are conceived and planned (Tomassian, 2009).⁵ Another issue that surfaces quite prominently in the context of regional infrastructure projects is the choice between bilateral project negotiations based on the project-to-project approach and a formal regional institutional and legal framework involving the participating countries at all stages of project development. On the face of it, both approaches are not apparently flawless. While the project-to-project approach works well in certain cases, the risk of cost escalation in the form of high transaction costs, high failure rates and long lead times cannot be avoided. On the other hand, the evidence on the efficacy of formal regional policies on infrastructure development is not known.

3.2.4. Role of Governments

Regional infrastructure projects involve a number of countries having diverse interests and priorities. Very often, investment in projects of this nature fail to take off due to conflict of interests rooted in differences in political and governance systems, divergent perceptions on costs and benefits, and local specificities with respect to infrastructure policies and regulations.⁶ In addition to reforms in government regulations and procedures, the private sector could play an important role in bringing operational efficiency. Public-Private Partnership (PPP) in that sense provides a viable alternative to the public sector for dealing with implementation-related issues. It could be envisioned as a model strategy that makes a balanced distribution of responsibilities between the government and the private sector based on their own core competencies. At the same time, there is a need to establish suitable incentives to encourage multi-party investment structures and discourage 'beggar-thy-neighbor' policies.

3.2.5. Reform in Infrastructure Sectors

It is widely recognized that the mere expansion of infrastructure networks and services is not sufficient to optimize development impact. There is a need to introduce reforms in the existing regulatory and institutional apparatus with focus on the key areas of policy planning, design and post-implementation management. In Latin America, it is found that an integrated approach to infrastructure, logistics and mobility policies yields better outcome than piecemeal approaches. This would help improve and strengthen public institutions by boosting coordination within the state agencies and consolidating relationship with the private sector through modern regulatory networks (ECLAC-UNASUR, 2012). Unlike the traditional efficiency-enhancing objectives, regional infrastructure projects are now governed by a new paradigm that links environmental sustainability concerns to the broader project objectives. In that parlance, suitable and adaptive mechanisms need to be instituted to mitigate the environmental and social costs associated with the cross-border infrastructure projects.

3.2.6. Public-Private Partnership

Given the larger volume of investment, natural monopolies and high sunk costs, infrastructure projects are generally implemented by the government sector. Private investors on the other hand show greater degree of risk aversion and invest in select projects with prospects of high profits and certain commercial viability. In view of these complications, the PPP model seems to be more feasible in practice. The experiences of ADB and other multilateral bodies highlight the success of the PPP model of financing and project implementation, particularly in the East Asian economies. Countries like Thailand and Malaysia have experienced larger amounts of private investment in infrastructure in the recent years (Stone, 2008). Moreover, PPPs have emerged as an important means of foreign direct investment in public utilities and infrastructure sectors. For countries facing inadequate fiscal resources, PPP appears to be the preferred mode of funding infrastructure (Kateja, 2012). The economic significance of private sector participation in infrastructure projects is reflected in the promotion of transparent and competitive bidding and implementation of cross-country infrastructure projects. By establishing the necessary mechanisms, standards and regulations, public and private investors could work together for the optimum outcome. The existing pattern of infrastructure investments must be replaced by a new approach that encourages sustainability and efficiency in investment decision making (ECLAC-UNASUR, 2012).

4. Sector Overview and Policy Environment

The nature of constraints and policy challenges are quite dissimilar for different infrastructure sectors. In addition, country differences in the IOR-ARC region are widely manifested in terms of varied access to physical infrastructure, finance, and execution and management expertise. It, therefore, requires a clear understanding on the current state of infrastructure sectors in the member states and the potential areas of regional cooperation for more sustained and holistic development of regional infrastructure. Against this backdrop, this section corroborates data and information on infrastructure in different member states and identifies the major policy initiatives undertaken in this regard.

4.1. Road

Road is the most widely used means of transportation for passenger and cargo traffic in many regions of the world. Despite innovations in multi-modal transport systems the importance of roads in physical mobility of people, goods and raw materials cannot be underestimated. Well-designed road networks facilitate faster clearance of cargo traffic, improve efficiency of other modes of transportation, and create income and employment opportunities in tourism, agriculture and industrial sectors. In particular, regional highways and transit routes have enabled steady growth in cross-border trade and investment in several regions. Further, regional cooperation in the road sector reduces transaction costs associated with trade between neighbouring countries and helps exploit national and regional comparative advantages. Regional groups like ASEAN, SAARC, the Pacific Islands Forum (PIF) and Economic Cooperation organization (ECO) have formulated comprehensive plans for strengthening transport linkages in their respective sub-regions involving all modes of transportation such as roads, railways, air and seaports.

Among the pan-Asian initiatives, the Asian Land Transport Infrastructure Development (ALTID) is a mega regional project that aims to assist member countries in providing reliable and efficient land transport in the Asian region as well as linkages with Europe and Western Asia.⁷ As part of this project, the Asian Highway Network proposes to link the existing highways in 32 countries in Asia and establish links to select locations in Europe. Two other initiatives namely the ASEAN Framework Agreement on Services (AFAS) and the Greater Mekong Sub-Region (GMS) Regional Economic Cooperation are two successful interventions in the field of regional infrastructure. AFAS envisages the liberalization of international freight transport services by 2015. Similarly, the objective of the GMS initiative is to facilitate efficient freight and passenger crossborder transport which in turn will improve intra-regional market access

for GMS products and trade competitiveness.⁸ Besides regional initiatives, countries have their own policies for the road sector with elaborate schemes for construction of new roads and repair and maintenance of national, sub-national and district/county roads.

Road sector in the IOR-ARC countries is largely characterized by high road intensity⁹, low cross-country linkages and low productivity of transport services. Some countries face the burden of excessive reliance on roads for cargo traffic, undue emphasis on mega projects in urban areas (e.g. Thailand), price distortions, lack of regulations on congestion and pollution and so on. The LDCs such as Bangladesh and Kenya lack integration of transport modes and miss connectivity to strategic international transit which affects the countries' prospects of regional integration. In addition, the poor condition of roads in Kenya is attributed to lack of funding and absence of a national spatial plan.¹⁰ In recent years, the Govt. of Bangladesh has implemented a number of policies on the construction of new roads, developing multi-modal transport networks and regional connectivity. It has also successfully completed the physical alignment of Asian Highway route in the country. All these measures are expected to pave the way for a greater integration of country's national networks to the Asian Highway and Trans-Asian Railway Networks. Infrastructure development being a key priority, the Govt. of India has undertaken comprehensive policy measures to integrate and develop national and state highways. However, the current level of investment in the road sector is far from the desired level. This has been reflected in stagnation in road length expansion and no visible improvement in the quality of roads.¹¹ India currently allows FDI up to 100 per cent under the automatic route in projects for construction and maintenance of roads, highways, vehicular bridges, toll roads, etc.

In Indonesia, road construction has become sluggish and a huge mismatch exists between the distribution of roads and the concentration of economic activity. Investment in roads has not kept pace with the increasing demand for road expansion and maintenance. In this regard, the Govt. of Indonesia has introduced a Master Plan for Acceleration and Expansion of Indonesia's Economic Development. While the recent steps taken by the Indonesian government is laudable especially the legislative and institutional frameworks for toll roads, the implementation of PPP is severely constrained by a complex land acquisition and weak project preparation and selection processes. The condition of roads in South Africa is more or less similar to other countries in the region. It is therefore necessary to ensure a proper allocation of investments across the road and rail lines so as to enhance the efficacy of existing transport networks. Keeping the long-term development goals in mind, future investment in South Africa must take cognizance of the following aspects:- maintenance of existing infrastructure, improving operating

efficiency, strengthening performance of entities responsible for repair and maintenance, and greater participation of the private sector through PPP.¹²

For Tanzania, road transport contributes to about 20 per cent of country's regional cross-border trade and has strong potential to grow in the future. However, the road sector in the country is badly affected by poor maintenance and inadequate development. The key policy priority for the country has therefore shifted to promoting public investment either in partnership with the private sector or with private sector organizations for non-commercial regional infrastructure. In view of these challenges, most of the member states have made collaborations with other countries for liberalization of cross-border transport and improving the transport corridors in the region.

4.2. Power

Efficiency in energy production and utilization is key to holistic and sustainable economic development of a country. Of various forms of energy, electricity is a vital resource for industrial production and domestic household consumption. In growing economies, the demand for electricity use increases in commensurate with the expansion of economic activities. Very often, countries facing acute power shortage import electricity from the neighbouring countries. In that sense, regional power pool is a robust mechanism for efficient and reliable distribution of power produced within a region. Regional power pools in Southern Africa, Nordic countries and the United States have become effective institutions for pooling regional power generation and distribution in their respective jurisdictions. The motivation for regional power pool is rooted on the benefits that the participating countries could derive in terms of better use of aggregate generation capacity, improved collective preparedness for emergencies and shortfalls, and efficient utilization of interconnected national power grids.¹³ Further, these regional pools aim at promoting efficient electricity markets and encourage trade between the surplus and the deficient partners. Till date, no such formal arrangement on regional power pooling exists among the IOR-ARC countries. Regional cooperation in electricity sector in the IOR-ARC region is desirable from the angle of complementarity arising from the differences in member states' primary resource endowments and generation capacity. In a regional arrangement, member countries can actively trade and benefit from lower transaction costs and common policies towards risk management and sustainability parameters including alternative renewable sources of power.

As primary resource endowments and power generation capacity differ significantly across the region, there is merit in forming a regional arrangement called regional power pool among the member states for effective distribution of power generated within the region, profitable power trade and broader cooperation in resource management and energy use. Regional power pools in

Southern Africa, Nordic countries, and other countries provide best examples for learning and replication.

The demand for energy especially electricity has grown manifold in most of the IOR-ARC member states on account of several factors such as GDP growth, industrial development and population growth. Despite efforts towards increasing electricity production, the demand-supply mismatch in most countries remains unresolved. The member states facing power shortage including Kenya, India, Indonesia, Malaysia, Oman, Bangladesh and others have undertaken a slew of reform measures aimed at creating additional generation capacity, minimizing transmission and distribution losses, streamlining tariff, rationalizing subsidies and harmonizing national regulatory practices. In some cases, the existing generation capacity of power plants has not been utilized optimally due to problems in land acquisition, shortage of fuel, supply of material, and other regulatory and logistics issues.

Coal, oil and gas still play a dominant role as sources of electricity generation, with renewable sources like hydro, wind, biomass, nuclear making a small percentage of the energy picture of the region. Recently, the Governments of the member countries have taken several initiatives towards promotion of renewable energy generation. Some of those include the setting up of Clean Energy Fund in India, introduction of tax incentives, Energy conservation fund and oil fund in Thailand, among others. Sectors like hydropower and wind energy are currently underdeveloped in many of these countries despite the abundant stock of naturally occurring resources suitable for power generation. For instance, Indonesia, given its island topography has a huge potential for development of hydropower market, which currently is in a nascent stage.

There has been greater emphasis on encouraging private sector participation in power sector so as to accelerate capacity addition and minimize losses to enhance access to electricity, which is currently quite low in IOR-ARC countries like Bangladesh, Mozambique and Tanzania. India has introduced several policy measures in electricity production and tariff policies that have instilled confidence among the private players. Foreign direct investment has also been permitted in power generation, transmission, distribution and trading to the extent of 100 per cent under the automatic route in hydro electric, coal/lignite thermal, oil-based thermal and gas-based thermal power plants.

4.3. Ports

Well-developed ports reduce transaction costs, ensure faster clearance of cargo, and bring efficiency in cross-border trade. Moreover, increased port access and efficient cargo handling and terminal management not only enhance productivity of the maritime sector but generate ripple effects in other sectors of the economy. In a multi-modal transport structure, efficient port network may raise efficiency of other modes of transportation such as

roads, railways and airways. At present, IOR-ARC does not have any comprehensive policy on port development even though member countries have their own policies for the maritime sector. Most of them face severe capacity constraints, financing problems, and regulatory and institutional bottlenecks. All those problems have led to poor performance of non-major ports, low productivity, inefficient cargo handling, and inadequate connectivity with other modes of transport. In this context, three issues that attract substantial policy attention are (i) the need for creating additional port capacity, (ii) raising the present level of investment in ports, and (iii) larger role for public-private partnership.

Regional economies have undertaken several policy measures to address some of the challenges in the port sector. These policy initiatives are broadly aimed at enhancing competitiveness, improving service quality, creating enabling environment for private investment, and effectively linking port development to larger development issues. These reforms in turn would improve barriers to trade, reduce transaction costs, increase competition and contestability, and provide important linkages to domestic and global value chains.¹⁴ Although it is hard to establish a pattern in national policies for port sector in the different IOR-ARC member countries, certain country-level initiatives are noteworthy. Australia has substantially liberalized its coastal shipping sector. Likewise, India has introduced a long-term framework in its National Maritime Agenda 2010-20 for the coming decade and emphasized capacity creation with significant involvement of the private sector. Similarly, the Govt. of Singapore has taken measures to enhance competitiveness of ports by streamlining the preferential corporate tax regime for the maritime sector and encouraging further investment in port infrastructure. Investment in port-related activities and services has been classified as priority activities with provisions for possible tax exemption and other benefits.

In the maritime policy, there should be enough flexibility to allow for introduction of new technologies, new business models, and changing market conditions and customer needs.¹⁵ Australia has already embarked upon a liberal regulatory framework for the maritime sector. There are no specific barriers to entry for domestic providers in international shipping. Commercial regulation of port and auxiliary services involves no barriers to entry for either domestic or foreign providers, except in sectors where there are market failures. According to the New Policy implemented through the reforms of the Ministerial Guidelines in 2008 and 2009, the government proposes to enhance competitiveness and sustainability of the Australian coastal shipping sector. The performance of all five main Australian ports is quite low due to lack of economies of scale and inter- and intra-port competition. The Competition and Infrastructure Reforms Agreement (CIRA) was promulgated in 2006 with an aim to achieve a simpler and more consistent national approach to economic regulation in significant infrastructure. With respect to intermodal approach,

the big task is to facilitate coordination between the different modes, both in harmonization of regulation between the states and in the prioritization and financing of large components of infrastructure.

Despite improvement in several areas, India faces a number of challenges in the port sector. The sector has grown tremendously in the past decade following growth in the external sector. Besides the major ports, the share of non-major ports in total traffic demand has improved substantially. As regards private sector participation, the success of certain PPP projects is evident. However, the existing capacity is short of demand arising from trade expansion. The Govt. of India has listed several components of its port expansion plans in the medium-term which includes project-related port development, improvement in port equipments capacity, deepening of channels for improvements in drafts, connectivity enhancement programme, and other port-related schemes.

Besides surface transport by roads and railways, maritime sector particularly development of ports is key to physical infrastructure integration in a region. Many regional initiatives on infrastructure have separate comprehensive sectoral plans for different infrastructure sectors and sub-sectors. For example, IIRSA considers port as a priority sector in the portfolio of infrastructure projects identified for the member countries in the Southern America region. Under this initiative, port development and related fields assume importance from the perspective of sectoral integration.¹⁶ For the maritime sector, IIRSA has identified 31 projects with total funding amounting to US\$3391 million. This accounts for 6.9 per cent of total infrastructure projects and 6.1 per cent of total funds allocated for regional infrastructure. Likewise, underdeveloped port sector has been identified as a formidable obstacle to faster economic integration in the Southern Africa region. Ports in Southern Africa have insufficient capacity to cope with increasing traffic. There is a compelling need to develop modern ports in the region so as to strengthen regional integration.¹⁷

4.4. Railways

The importance of railways in fostering physical connectivity and boosting trade and economic activities among different regions remains undisputed in view of the growing economic integration in the world. It not only strengthens connectivity between the distant and remote regions but also raises the efficiency of other modes of transportation especially roads. Rail network in the IOR-ARC region varies widely across the member states in terms of rail length, access to latest technology, freight management and level of private investment. As of today, the region does not have any formal mechanism for regional cooperation in railways. However, some member countries are part of several regional initiatives on railways that are being implemented or at various

stages of conception. These include the Trans Asian Railway (TAR), Gulf Railway Network (GRN), African Union of Railways (AUR), and so on. While the participating member countries may benefit from these existing initiatives, a regional scheme for development of railways would help fuel the process of economic integration and create scope for trade and commerce in the IOR-ARC region.

In the Trans Asian Railway project, five IOR-ARC countries namely India, Indonesia, Iran, Thailand and Sri Lanka are participants besides Russia and some CIS countries. Although the project was initiated in the 1960s, there was hardly any visible progress in the project goals till the 1990s because of political and economic obstacles. The project was revived with the passage of TAR on June 11, 2009. The project aims to build a transcontinental railway network between Asia, Europe and Pacific ports in China. Out of the four corridors planned under the project, the Southern Corridor covers a number of IOR-ARC countries. However, a good number of member states are not part of this project. Similarly, Oman and UAE are members in the Gulf Railways network that aims to build a 1940-km regional network by 2017. In Africa, AUR seems to be a grand initiative with the objective of integrating the existing rail network in the region by connecting the disjoint and disconnected railway networks. It may involve different components including gauge conversion, mining railways, port linkages, electrification, and so on. Being a pan-African initiative, AUR does not have any specific plan for developing new rail infrastructure and linking railways to the broader regional freight and passenger traffic management. In view of these fragmented approaches, the social desirability of a regional railways network in the IOR-ARC region is justified and meaningful.

At the individual level, IOR-ARC countries have introduced comprehensive reforms in their rail networks by integrating railways into the broader goals of a multi-modal transportation system and encouraging wider participation of private investors. Some of those notable reform measures include a concerted policy on shifting freight and passenger traffic from road to rail in Thailand, expanding the Maputo line that represents an integral component of a successful Spatial Development Initiative in Africa in Mozambique, renewed thrust on rehabilitation and redevelopment projects in Kenya, modernization drive in Bangladesh and India, and so on.¹⁸ In addition to building additional freight and passenger traffic capacity, member states have tended to emphasize on developmental issues such as establishing an efficient urban transport system, enhanced role of PPP, improved safety concerns, and envisioning railways as a vital means of economic integration within and outside the geographical boundaries of the nation states.

While some sort of commonality is noticed in the member states' reform policies, the problems they face in railways sector are quite different. For some countries e.g. Thailand, Kenya, Mozambique, the rail sector/agency has been incurring losses or lack adequate scope for revenue diversification. In view of

mounting losses, the Govt. of Thailand is now considering a comprehensive overhauling of its railway network by inviting technology infusion and private investment with an aim to build a competitive and integrated transport system in the country.¹⁹ Unlike roads, investment in railway hardware and software in Thailand has gone down over time. This was reflected in a sharp fall in freight traffic from 9 per cent in 2000 to around 2 per cent in 2012. In response, the Govt. of Thailand has focused on the policy of open access in the railway sector so as to ensure a competitive environment in infrastructure development and operations. Likewise, railways sector in Kenya is facing severe resource crunch and has not witnessed any meaningful investment in rail infrastructure and operations for a long period. This has terribly deteriorated its customer base and eroded competitiveness of a crucial means of transportation in the country. In order to provide amicable solutions to these problems, the Govt. of Kenya has formulated the *Vision 2030* policy that envisages a clear roadmap for the rehabilitation and redevelopment of rail projects over the next 20-year period.²⁰

Besides Kenya, railways in Mozambique serve as a lifeline for its economy and a crucial gateway for connectivity in Africa. However, the performance of railways in the country was adversely affected during 2005-08 due to low passenger and cargo traffic. At the same time, the locomotive, carriage and wagon productivities are believed to have deteriorated in the recent years. Two factors such as increased coal production and rising trade with neighbouring countries seem to have triggered a surge in demand for better and reliable rail services in Mozambique.²¹ This has prompted the government to attract private sector participation in its major rail operations. Similarly, the rail sector in Bangladesh and Indonesia are grappling with several challenges that seriously impair growth in these economies. The weak performance of railways in Indonesia could be largely attributed to poor infrastructure, inadequate application of technology and poor quality management. On the other hand, Bangladesh lacks sufficient capital for investment and face the burden of inefficient management.

As mentioned above, there seems to be a convergence in the member countries' approach towards development of railways in the IOR-ARC region. To a great extent, the onus has shifted to promoting private investment and constructively engaging the private players in construction and operations of rail projects. Keeping the long-term interests of the region in mind, it boils down to the importance of a regional framework for railways which would constitute a crucial component of regional infrastructure development. Recently, the Govt. of Bangladesh has signed a regional railways agreement during the SAARC Summit in 2011. Further, the Govt. of Thailand buys the proposal of interconnecting the GMS countries' railway networks under the GMS Cooperation Programme. In similar fashion, the member countries are expected to devise policies for cooperation in regional rail development.

4.5. Information and Communication Technology

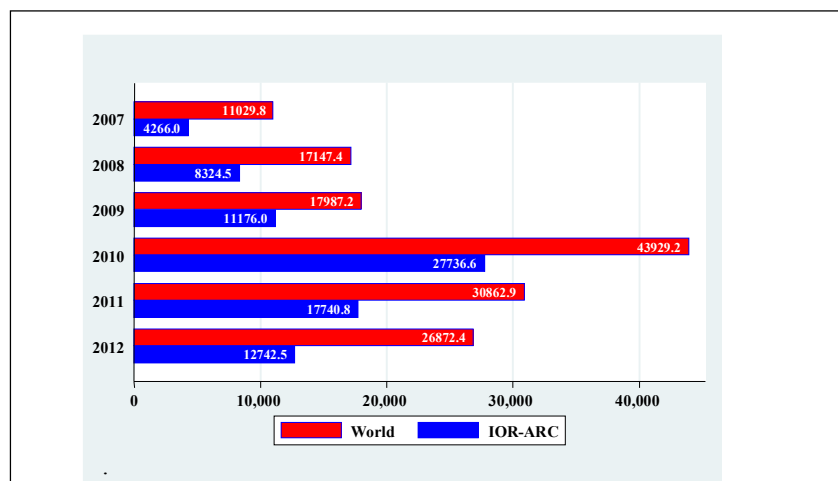
Over the past two decades, information and communication technology (ICT) has emerged as the most vibrant sector by creating jobs and opportunities for the teeming millions in the world. More prominently, ICT has played a key role in linking the lagging sectors and regions to the mainstream economy. As ICT applications and services have become widespread in almost all spheres of economic activity and social life, countries are in the race to develop their domestic ICT sector and make it competitive so as to grab opportunities created elsewhere in the world. Besides national policy initiatives, a number of regional and sub-regional initiatives exist for promoting regional cooperation in ICT development and its wider use in the society. Some of those include the regional e-commerce initiatives in ASEAN, APEC and European Union, COMESA Regional e-Government Framework, Caribbean e-Government Knowledge Bank, Central America Initiative on e-Government for Regional Development and Integration, Regional Information and Communication Technology for Development Strategy in CARICOM, and so on.

Broadly, regional initiatives on ICT are aimed at sharing expertise and building regional capacities for holistic and integrated development of ICT in the respective regions. Implicitly, these regional mechanisms create scope for promoting investment in the emerging fields in ICT, particularly pooling regional resources. In the e-ASEAN Framework Agreement, the ASEAN countries have emphasized on enhancing competitiveness of ICT sector in the region by promoting e-commerce, e-governance, and other related services sectors for IT applications. Likewise, the regional e-government schemes mentioned above are devised to address the demands for ICT infrastructure and services. Among the ICT-enabled businesses, e-commerce is emerging as a vibrant and cost-effective mode of transactions. Although e-commerce activities are globally governed by the WTO rules and regulations, the business models for e-commerce differ substantially across regions.²² However, there is increasing recognition of the fact that regional collaboration on e-commerce projects, constraints and opportunities would lead to increased awareness among the participating nations and harmonize business processes.

5. India's Outward Infrastructure FDI in IOR-ARC Countries

Overall, India's outward foreign direct investment in infrastructure (henceforth, infrastructure OFDI) to the rest of the world has gone up significantly from approximately US\$11 billion in 2007 to roughly US\$44 billion in 2010. For the IOR-ARC region as a whole, it has increased steadily at a CAGR of 86.6 per cent from US\$4.3 billion in 2007 to US\$27.7 billion in 2010. During 2007-12, total cumulative infrastructure OFDI of India to the IOR-ARC region is estimated to be around US\$82 billion (Figure 1). Even though it fell sharply in the subsequent years amidst clouds of uncertainty due to slower recovery from the wear and tear of the global economic recession during 2007-09, infrastructure investment is likely to revive in the near future.

Figure 1: Infrastructure OFDI of India in World and IOR-ARC Region (US\$ Million)



Source: RIS based on data from RBI.

While infrastructure OFDI to all major regions of the world has witnessed a sustained rise in the recent years, IOR-ARC appears to be a promising destination for India's infrastructure investments. The region accounts for more than 60 per cent of India's total global investments in infrastructure. Infrastructure OFDI to the region rose phenomenally in 2010, and then fell sharply by 36 per cent and 28.2 per cent in 2011 and 2012 respectively. Within the IOR-ARC region, the member states belonging to the Middle East and South-East Asia have experienced a surge in infrastructure investments compared to countries in other sub-regions. Investment flows to South-East Asian member countries grew at a faster pace in the late 2000s and reached the highest of 92 per cent in 2010. The other regions that have recorded

significant growth²³ in India's infrastructure OFDI include GCC (118.6%), LAIA (56.8%), EU-27 (56%), LAC (44.6%), ASEAN (38.6%), and APEC (37.9%). Even though global investment climate remains largely subdued in the post-recession period, India's investment in infrastructure in the South-East Asian countries has not been adversely affected. In addition, a substantial chunk of infrastructure OFDI has gone to the member states belonging to Africa. This is manifested in a sharp rise in the share of African member states in total infrastructure OFDI of India to the region from 7 per cent in 2010 to 35.6 per cent in 2011 and 39.5 per cent in 2012 respectively (Table 4).

Table 4: Infrastructure OFDI of India in Select Regions/RTAs

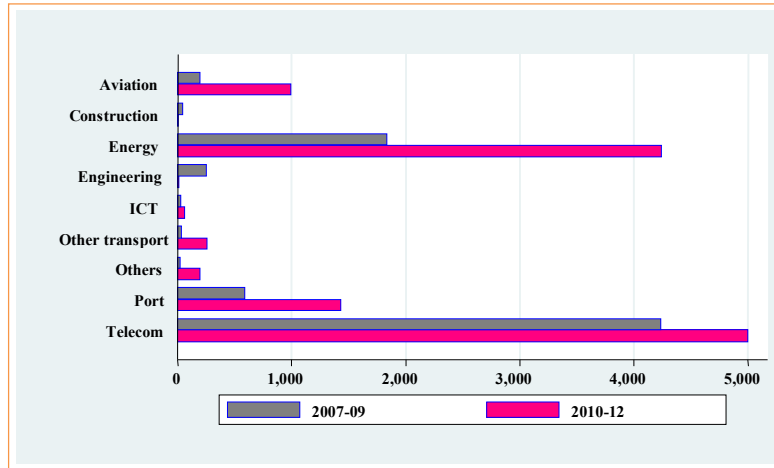
Region	(US\$ Million)						CAGR 2007-09/ 2010-12
	Actual						
	2007	2008	2009	2010	2011	2012	
COMESA	1020.8	701.2	538.6	645.4	1871.4	917.6	15.0
ECOWAS	18.5	19.6	28.4	0.9	0.5	0.4	-70.5
SADC	1030.2	704.1	538.6	648.2	1871.7	916.9	14.8
ASEAN	551.1	1030.8	3304.4	8571.9	3224.5	1214.8	38.6
APTA	4.8	45.4	13.0	20.8	78.1	12.4	20.8
BIMST-EC	2.9	40.2	19.7	27.6	82.9	19.0	27.3
GCC	9.0	17.1	6.2	85.6	75.3	176.5	118.6
SAARC	8.0	40.1	19.7	27.5	82.9	19.0	24.0
EU-27	949.7	460.4	1540.3	6637.9	1719.8	2843.8	56.0
Latin America & Caribbean	84.7	436.6	95.8	292.2	499.1	1074.1	44.6
LAIA	20.3	30.0	21.0	204.9	52.5	17.7	56.8
NAFTA	47.3	87.9	6.7	29.8	89.8	181.5	28.5
APEC	600.5	1126.1	3383.6	8648.4	3338.9	1414.2	37.9
IOR-ARC	1593.0	1793.1	3862.2	9325.3	5252.1	2321.6	32.6

Source: RIS based on data from RBI.

Note: CAGR is computed based on the cumulative figures for two periods, 2007-09 & 2010-12.

Unlike China, India's infrastructure investments are not targeted to the extractive industries such as oil and minerals. In fact, more than 70 per cent of total infrastructure OFDI to the IOR-ARC region has been invested in manufacturing sectors particularly in telecom and energy. These two sectors account for 56.3 per cent and 25.1 per cent of total infrastructure investments in the region during 2010-12. The other infrastructure sectors such as aviation, port, other transport, and logistics have shown positive growth in investment flows and exhibit huge potential for Indian investors. For instance, besides telecom and energy, the sectors that attract higher investments from India are ports and aviation. Investment in ports and aviation as proportion of total infrastructure OFDI of India to the region has gone up from 8.2 per cent and 2.7 per cent during 2007-09 to 8.5 per cent and 5.9 per cent during 2010-12 respectively (Figure 2 & Table 5).

Figure 2: Infrastructure OFDI of India in IOR-ARC by Sector (US\$ Million)



Source: RIS based on data from RBI.

Table 5: Infrastructure OFDI of India in IOR-ARC Region by Sectors

Sector	Sub-sector	Actual (US\$ Million) (2010-12)	Share (%)		CAGR (%) (2007-09/ 2010-12)
			2007-09	2010-12	
Aviation	Airport	978.7	2.70	5.79	71.0
	Aviation	10.2	0.00	0.06	-
Construction	Real Estate	4.9	0.60	0.03	-51.6
Energy	Energy	1531.1	0.16	9.06	406.3
	Power	2712.3	25.11	16.05	14.2
Engineering	Engineering	10.6	3.41	0.06	-65.0
ICT	ICT	62.5	0.38	0.37	31.3
logistics	logistics	125.1	0.02	0.74	358.3
Other Communication	Other Communication	29.8	0.00	0.18	363.1
Other transport	Other transport	258.1	0.51	1.53	90.9
Others	Mining	6.3	0.02	0.04	57.9
	Others	164.2	0.52	0.97	63.2
Port	Cargo	6.6	0.01	0.04	102.1
	Port	440.0	4.20	2.60	13.1
	Shipping	984.4	3.94	5.83	51.1
Power	Power	1.8	0.00	0.01	-
Sanitation, water & health	Sanitation, water & health	58.0	0.02	0.34	275.0
Shipping	Port	1.7	0.00	0.01	-
Telecom	Telecom	9512.7	58.40	56.29	31.0

Source: RBI.

Table 6: India's Infra OFDI in IOR-ARC Countries (Cumulative Flows between June 2007- Mar 2013)

Country	Aviation	Construction	Energy	Engineering	ICT	Logistics	Other Communication	Other Transport	Others	Port	Power	Sanitation, Water & Health	Shipping	Telecom	Total
ARE	0.9 (0.1)	-	195.1 (3.2)	0.6 (0.2)	-	119.3 (94.4)	0.3 (1.0)	5.0 (1.7)	24.6 (11.7)	10.2 (0.5)	-	-	-	3.9 (0.03)	359.9 (1.5)
AUS	-	-	-	1.8 (0.7)	0	-	-	-	0	-	-	4.4 (7.4)	-	-	6.3 (0.03)
BGD	0.1 (0.01)	-	7.8 (0.1)	0	-	-	0.1 (0.2)	-	0	0	-	-	-	1.0 (0.01)	9.0 (0.04)
IDN	-	-	-	249.7 (96.9)	-	-	0.04 (0.1)	36.5 (12.4)	-	0.3 (0.01)	-	0.2 (0.4)	-	0.7 (0.01)	287.5 (1.2)
KEN	-	-	-	-	-	-	0.2 (0.6)	-	0.1 (0.04)	0.2 (0.01)	-	0	-	0.8 (0.01)	1.2 (0.01)
LKA	2.9 (0.2)	-	11.8 (0.2)	-	-	0	-	0.3 (0.1)	1.3 (0.6)	0	1.6 (90.9)	-	1.7 (100)	135.8 (1.0)	155.4 (0.6)
MDG	-	-	-	-	-	-	-	-	1.9 (0.9)	-	-	-	-	0	1.9 (0.01)
MOZ	-	-	-	-	-	-	-	3.9 (1.3)	-	-	-	-	-	-	3.9 (0.02)
MUS	886.5 (74.8)	-	2923.8 (48.1)	-	-	-	9.9 (32.8)	0.6 (0.2)	22.9 (10.9)	707.1 (35.0)	-	2.1 (3.6)	-	1135.6 (8.3)	5688.6 (23.6)
MYS	-	-	-	-	-	0.1 (0.1)	0	0.3 (0.1)	2.3 (1.1)	0.2 (0.01)	-	-	-	-	2.9 (0.01)
OMN	-	-	-	5.0 (1.9)	-	1.0 (0.8)	-	-	2.4 (1.1)	0.9 (0.04)	-	-	-	-	9.2 (0.04)
SGP	294.2 (24.8)	48.1 (100)	2934.2 (48.3)	0.2 (0.1)	90.1 (100)	5.8 (4.6)	19.7 (65.4)	240.3 (81.4)	151.2 (72.1)	1302.3 (64.4)	-	52.4 (88.5)	-	12467.6 (90.7)	17606.0 (72.9)
SYC	-	-	-	-	-	-	-	-	2.5 (1.2)	-	-	-	-	-	2.5 (0.01)
THA	-	-	-	-	-	-	-	-	0.2 (0.1)	0.1 (0.01)	-	0	-	0.2 (0)	0.6 (0)
TZA	-	-	-	-	-	0.2 (0.2)	-	8.3 (2.8)	0.2 (0.1)	-	-	-	-	-	8.7 (0.04)
ZAF	0	-	2.8 (0.05)	0.4 (0.2)	-	-	-	-	0.1 (0.1)	0	0.1 (8.1)	-	-	0	3.6 (0.01)
Total	1184.6 (100) [4.9]	48.1 (100) [0.2]	6075.6 (100) [25.2]	257.8 (100) [1.1]	90.1 (100) [0.4]	126.4 (100) [0.5]	30.1 (100) [0.1]	295.2 (100) [1.2]	209.8 (100) [0.9]	2021.4 (100) [8.4]	1.8 (100) [0.01]	59.2 (100) [0.2]	1.7 (100) [0.01]	13745.7 (100) [56.9]	24147.4 (100) [100]

Source: RIS based on data from RBI.

Notes: Figures in parentheses denote percentages of respective sector total. Figures in squares indicate regional sectoral share in regional total.

As regards individual member states, a major fraction of India's infrastructure OFDI to the region is concentrated in two countries, namely Singapore and Mauritius. Cumulative flows to these two countries together consist of more than 95 per cent of total infrastructure OFDI to the region over the period from June 2007 to March 2013. Unlike Singapore and Mauritius where infrastructure OFDI of India is larger in volume and diversified into several sectors, infrastructure investment in other member states are restricted to some select sectors. Except a few sectors like construction, engineering, logistics, power and shipping, Singapore and Mauritius have remained the top two destinations for India's infrastructure investments in the region (Table 6). In terms of sectors, some countries appear as the single largest destinations for India's investments. These include Indonesia for engineering; the United Arab Emirates for logistics; Singapore for construction, ICT, telecom and sanitation, water and health; and Sri Lanka for power and shipping.

In nutshell, India's FDI in infrastructure sectors in the IOR-ARC region is growing over time and concentrated in few sectors and countries. However, there are signs of geographical and sectoral diversification in India's infrastructure investments in the region.

6. Infrastructure Finance

Financing is an integral component of cross-border infrastructure projects. Large infrastructure projects often fail to take off due to financing constraints despite having satisfactory feasibility parameters. In most cases, national infrastructure projects are funded by the respective governments with supplementary contributions from the multilateral and regional development finance institutions such as the World Bank, ADB, AfDB, IADB etc. in the form of external loans, preferably concessional in nature. With growing demand for physical connectivity and infrastructure services e.g. customs, logistics and trade facilitation, the traditional sources of infrastructure financing are found inadequate and constrained on a project-to-project basis because of competing demands for scarce public resources. This entails the need for exploring alternative and innovative financing mechanisms so as to cater to the potential demand for financing in different infrastructure sectors, both at national and regional levels.

As per the estimates made by the leading development banks, there exists huge potential for investment in infrastructure in different parts of the world. For instance, ADB (2009) has come up with some medium- and long-term projections on infrastructure investments for its member countries. It suggests that the overall national infrastructure investment needs in Asia are estimated to be US\$8 trillion covering 68 per cent of the amount required for installing new capacity and the rest 32 per cent for maintaining and replacing existing infrastructure assets with an average investment of about US\$730 billion per annum. Among the sectors, electricity and roads account for 51 per cent and 29 per cent of total projected investments respectively. Likewise, total investment needed for regional infrastructure is projected to be US\$290 billion covering 1,077 projects with an average investment of about US\$30 billion per year. The total corpus is allocated between transport and energy sectors in the proportion of 70:30 with 989 projects (US\$ 200 billion) and 88 projects (US\$ 80 billion) respectively.

Similarly, infrastructure sectors in the African countries have attracted substantial chunks of foreign investment in the recent years. The AfDB (2010) estimates that infrastructure financing requirement in the middle income countries in Africa are projected to be around 10 per cent of GDP per annum till 2020. A good number of countries in the Asia-Pacific region particularly the least developed countries (LDCs) are lagging behind others in infrastructure development compared to their peers in the developed regions of the world. To bridge this gap, the region would require an investment of about US\$ 800 billion over the next decade.²⁴

6.1. Type of Financing

Infrastructure projects are characterized by several complex economic, political and social objectives. Generally, infrastructure assets are large and indivisible having long gestation periods and very high social desirability. It is worth mention here that some of these features traditionally discouraged private investment in infrastructure projects even though the projects ensure reasonably healthy revenue streams. This is perhaps the reason for the large presence of public sector in infrastructure development and financing. Among the financing sources, public expenditure is the major traditional source of infrastructure finance. For many developing and LDCs, ordinary tax revenues constituted the biggest component of public expenditure that were allocated to building physical infrastructure till the mid-1990s.

Since the late 1990s, developing countries have liberalized their financial markets and introduced a number of initiatives and incentives for promoting investments, both domestic and foreign, with an aim to stimulate activity in the priority sectors. Investment in infrastructure sectors was given emphasis because of their larger economic, social and developmental implications. Financial instruments in both debt and equity forms with different combinations of maturity and risk profiles were developed to attract the wider participation of retail investors. This has not only helped pooling substantial portion of household (private) savings but reduced the burden on national exchequers in mobilizing resources for eligible infrastructure projects. In addition, infrastructure FDI flows to developing countries in the form of greenfield investments, joint ventures, divestiture and asset sales have significantly improved access to capital, advanced technology and modern management practices.²⁵

6.2. Public Financing of Infrastructure Projects

Despite significant rise in private investment in infrastructure, the role of public sector should not be undermined.²⁶ This applies strongly to the cross-border infrastructure projects as these projects involve many governments, diverse priorities, sovereign risk, risk of free riding, uncertainties about future costs and revenue streams, low political will in less developed areas and so on (IIRSA, 2012; ADB, 2009). Governments usually finance these projects by raising taxes or by issuing bonds in domestic financial markets. In Asia, a large part of domestic investments in infrastructure projects has been funded by local taxes or through local financial markets (ADB, 2009).

Moreover, the role of public sector is critical in providing sovereign guarantee to the private financiers, sharing risks, mobilizing necessary political will and adopting proper risk mitigation strategies. Recently, an Indian public sector infrastructure financing firm, India Infrastructure Financing Company Ltd. (IIFCL) has offered partial guarantee to the bonds issued by 15 infrastructure firms including GMR, GVK, Larsen and Toubro and Gamon. This guarantee is expected to improve the ratings of these bonds and allow insurance companies and pension funds to subscribe to these funds.²⁷ While recognizing the significance of private sector involvement in

infrastructure projects through the PPP mode, WEF (2010) identifies two core functions e.g. strong technical capacity and strategic capacity that the public sector could deliver most efficiently than the private players. However, this does not rule out the growing importance of private sector players in the infrastructure sectors.

6.3. Regional Financing Mechanisms

Multi-country infrastructure projects are largely financed by a resource pool drawn from the public resources of the participating countries including concessional and non-concessional support from the development finance institutions and private financing by the commercial banks and financial institutions. As the distribution of costs and benefits of regional infrastructure assets is not symmetric and not understood properly among the project stakeholders, there is a very high risk of non-cooperation (or low cooperation) by one or a few participating states. This political risk weakens the speed and efficiency of project implementation process and acts as disincentive to the interested private players. In this context, a well-tailored regional financial mechanism could prove effective in mitigating political risks and meet any shortfall in financing the feasible infrastructure projects at regional and sub-regional levels.

The regional infrastructure financing mechanisms that are already in force in Asia include the Regional Cooperation and Integration Financing Partnership Facility, Regional Cooperation and Poverty Reduction Fund, and Investment Climate Facilitation Fund. Two more initiatives are underway (inception stage), namely the Asian Infrastructure Financing Initiative (AIFI) and the Asian Infrastructure Fund (AIF) (ADB, 2009). Likewise, the South American Infrastructure Authority (ASI) caters to the financing requirements of regional infrastructure in the LAC region (Fung, Garcia-Herrero and Ng, 2011). There is a proposal to set up a new kind of national infrastructure bank in each country with an aim to mobilize local capital including insurance companies and pension funds for long-term investment in infrastructure and infrastructure project-related companies (WEF, 2010). Some regional initiatives that are visualized in the context of PPP seem to be practically more appealing than the public sector cross-border projects. In order to widen the investor base, the idea of establishing a Fund of Funds involving small investors for pooling resources in the East African Community (EAC) region may work in other regions as well (ICA, 2011).

In addition to the tailor-made region-specific programmes, there are a few innovative ways of mobilizing finances for cross-border infrastructure projects. These include the use of surplus foreign exchange reserves, investments by sovereign wealth funds (SWFs), dedicated special purpose vehicles (SPVs), and its prototypes. Some regional economic groupings such as SADC, COMESA and EAC are considering the issuance of regional infrastructure bonds which could not only foster diversification of infrastructure finance but help improve efficiency in local bond markets. Likewise, countries in the ECOWAS region have the provision of a community levy of 0.25 per cent for mobilizing

supplementary sources of infrastructure financing (UNESCECA-AUC, 2012). Among the alternative non-tax financing instruments, consumption tax, labour income tax and *octroi* are widely used for infrastructure projects (Brooks and Zhai, 2008). As the current level of official development assistance (ODA) is not enough for meeting the growing demand for infrastructure finance, these national and regional financing mechanisms would play a big role in filling the financing gap and enable timely execution of infrastructure projects.

The idea of using foreign exchange reserves as an innovative complementary source of infrastructure finance is already debated among the policy circles for some years now. Among the RTAs, the ASEAN has envisioned of utilizing a part of its foreign reserve stock for funding regional integration initiatives like the Asian Bond Fund, the Chiang Mai Initiative, etc. Infrastructure assets appear to be the most profitable investment options for the productive deployment of surplus foreign reserves in the region which could not only fetch higher returns but contribute to job creation and poverty alleviation.²⁸ AIFI is an ambitious regional scheme that aims to pool resources from the development partners in Asia and help improve financial intermediation in the region for infrastructure financing. In Latin America, the IIRSA has a number of infrastructure projects that are linked to the broader goal of regional integration in South America. As of 2009, 10 per cent of total projects (51 projects) in infrastructure portfolio in South America under the IIRSA have been completed. Of the rest projects, 196 (38 per cent) and 103 projects (20 per cent) are at various stages of implementation and preparation respectively (Table 7).

Table 7: IIRSA Infrastructure Project Portfolio, 2009

Stage of Projects	Percentage of Projects	No. of Projects	Estimated Investment (US\$ Billion)
Concluded	10%	51	7.506
In process of implementation	38%	196	30.728
In process of preparation	20%	103	17.383
Total	68%	350	55.617

Source: Compiled from Tomassian (2009).

In view of limited public sector funding, the importance of private sector participation in infrastructure has grown tremendously in the recent years. Private sector entities not only provide additional funding for the projects but also strengthen access to new fields of technical and managerial expertise. PPP modalities generally include management contracts, leasing, investment concessions, divestiture, de-monopolization, new entry and build-operate-transfer mode (AfDB, 2011). In Africa, PPPs have emerged as the most preferred mode of financing infrastructure projects. It is also considered as a viable financing alternative for infrastructure projects conceived under the IIRSA scheme (Fung, Garcia-Herrero and Ng, 2011). Although the PPP model works well for many projects, it does involve some risks. Those are mostly in the form of (i) renegotiations of many agreements, (ii) occasional substantial losses to those who had invested the money and (iii) exposure of the public sector to

potentially large contingent liabilities (Tanzi, 2005). Further, PPPs are not likely to play an important role in transnational or regional transportation projects.

6.4. Role of Multilateral Development Banks

Multilateral development banks (MDBs) have played a key role in mobilizing and financing projects in major infrastructure sectors all over the world including the lagging regions. Some of the established and prominent MDBs that have served the development community for long in the post-World War-II period are the World Bank, the Asian Development Bank (ADB), the African Development Bank (AfDB), and the Inter-American Development Bank (IADB). The role of MDBs in national and regional infrastructure projects is multi-dimensional and vital from the point of financing, project consultancy and feasibility studies. Besides the known MDBs such the World Bank and ADB, there are a number of institutions that primarily deal in bilateral infrastructure projects. The key players in bilateral financing are the Commonwealth Development Corporation (CDC), German Investment Corporation (DEG), Netherlands Development Finance Company (FMO), French Investment and Promotion Company for Economic Cooperation (Proparco), and so on.

As per the commitments made in 2009, all the four MDBs such as AfDB, ADB and EBRD have allocated significant proportions of funds to infrastructure projects that accounted for 52 per cent, 40 per cent, 37 per cent and 25 per cent of their total project commitments in that year. Likewise, a substantial amount of funding support to infrastructure projects was provided by the bilateral agencies. Financing of infrastructure projects by the CDC, DEG, FMO and Proparco amounted to 34 per cent, 19 per cent, 24 per cent and 36 per cent of their total project portfolio respectively in 2009 (Table 8).

Table 8: Financing of Infrastructure Projects by Development Finance Institutions (DFIs), 2009

Agency	Number of Projects
Bilaterals	
Commonwealth Development Corporation (CDC)	270 (34)
German Investment Corporation (DEG)	127 (19)
Netherlands Development Finance Company (FMO)	217 (24)
French Investment and Promotion Company for Economic Corporation (Proparco)	127 (36)
Multilaterals (commitments in 2009)	
African Development Bank (AfDB)	- (52)
Asian Development Bank (ADB)	- (40)
European Bank for Reconstruction and Development (EBRD)	121 (37)
International Finance Corporation (IFC)	142 (25)

Source: Kingombe (2011).

Notes: Figures in the parentheses denote percentage of total projects financed by respective institutions including non-infrastructure sectors. Due to non-availability of data on total number of projects, the number of infrastructure projects for AfDB and ADB could not be computed.

In the early 2000s, transport and ICT projects constituted the largest share in ADB's financing of infrastructure projects. In subsequent years, fund allocations to energy and multisector projects increased manifold. In particular, noticeable growth was observed in fund allocations to multisector projects since 2009. While traditional infrastructure portfolios i.e. transport and ICT continue to attract substantial amounts of ADB investments, the magnitude of investments in energy and multisector projects are seemingly higher than other sectors. During 2006-08, financing of projects in energy sector appeared to be significantly higher than the previous year allocations to the sector in the 2000s (Table 9).

Table 9: Structure of ADB's Implemented Projects by Broad Sectors

(US\$ Million)

Year	Energy	Multisector	Transport and ICT	Total
2003	4830 (21.8)	1420 (6.4)	15930 (71.8)	22180 (100)
2004	4928 (27.6)	2973 (16.6)	9956 (55.8)	17858 (100)
2005	3826 (13.0)	5770 (19.7)	19742 (67.3)	29338 (100)
2006	14592 (42.8)	4624 (13.6)	14886 (43.7)	34102 (100)
2007	19296 (43.6)	1082 (2.4)	23890 (54.0)	44267 (100)
2008	25748 (48.0)	8510 (15.9)	19367 (36.1)	53625 (100)
2009	11608 (24.4)	15949 (33.6)	19978 (42.0)	47535 (100)
2010	14022 (20.0)	25665 (36.6)	30438 (43.4)	70125 (100)
2011	22637 (28.9)	29732 (38.0)	25963 (33.1)	78332 (100)
2012	7181 (11.7)	31919 (51.9)	22360 (36.4)	61459 (100)
2003-07 (Avg.)	9494	3174	16881	29549
2008-12 (Avg.)	16239	22355	23621	62216
2003-07 (CAGR)	41.4	-6.6	10.7	18.9
2008-12 (CAGR)	-27.3	39.2	3.7	3.5

Source: ADB (<http://www.adb.org/projects>).

Note: Figures in parentheses represent shares of respective year total.

In terms of sub-sector allocations, the structure of ADB's infrastructure financing has become quite diversified in the late 2000s. This is reflected in the falling share of road transport from 57.9 per cent in 2003 to 45.2 per cent in 2007, and finally to 26.4 per cent in 2012. While multi-sector projects attract more than 50 per cent of total ADB investments in 2012, financing of projects in other sectors such as large hydropower and urban transport registered modest growth in the recent years (Table 10).

Table 10: Structure of ADB's Implemented Projects by Sub-Sectors
(US\$ Million)

Sector	2003	2007	2012
Air Transport	2 (0.01)	2 (0.003)	14 (0.02)
Conventional Energy	-	5283 (11.9)	-
Electricity Transmission and Distribution	2437 (11.0)	7496 (16.9)	3229 (5.25)
Energy Efficiency and Conservation	140 (0.6)	11.8 (0.03)	4 (0.01)
Energy Sector Development	2250 (10.1)	6122 (13.8)	102 (0.2)
Energy Utility Services			1000 (1.6)
ICT			108 (0.2)
Large Hydropower	2.1 (0.01)	379 (0.9)	2835 (4.6)
Multisector	1420 (6.4)	1082 (2.4)	31919 (51.9)
Pipelines		5 (0.01)	
Rail Transport	2003 (9.0)	1453 (3.3)	6 (0.01)
Renewable Energy		1 (0.001)	11 (0.02)
Road Transport	12842 (57.9)	20017 (45.2)	16242 (26.4)
Transport Management and Policies			2408 (3.9)
Urban Transport	1080 (4.9)	6 (0.01)	2983(4.9)
Water Transport	4.0 (0.02)	2412 (5.5)	600 (1.0)

Source: ADB (<http://www.adb.org/projects>).

Note: Figures in parentheses represent shares of respective year total.

ADB support for infrastructure projects is available in four different forms such as grant, loan, multitranche financing facility and technical assistance. During 2003-12, the mode of ADB financing of infrastructure projects has undergone a structural change. Traditionally, most ADB projects in infrastructure sectors were in the form of loans to the concerned countries. In subsequent years, the proportion of loans and grants has declined whereas the multitranche financing facility and technical assistance has emerged as the preferred modes of financing infrastructure projects (Table 11).

Table 11: Structure of ADB's Implemented Projects by Type of Investment

(US\$ Million)

Year	Grant	Loan	Multitranche Financing Facility (MFF)	Technical Assistance	Total
2003	-	22146 (99.8)	-	34 (0.2)	22180 (100)
2004	-	17744 (99.4)	-	114 (0.60)	17858 (100)
2005	2308 (7.9)	14619 (49.8)	10600 (36.1)	1812 (6.2)	29338 (100)
2006	110 (0.3)	11903 (34.9)	21753 (63.8)	336 (1.0)	34102 (100)
2007	724 (1.6)	19142 (43.2)	24308 (54.9)	94 (0.2)	44267 (100)
2008	859 (1.6)	17535 (32.7)	33539 (62.5)	1692 (3.2)	53625 (100)
2009	2806 (5.9)	12944 (27.2)	27696 (58.3)	4089 (8.6)	47535(100)
2010	1841 (2.6)	29864 (42.6)	32081 (45.7)	6339 (9.0)	70125(100)
2011	883 (1.1)	27175 (34.7)	41019 (52.4)	9256 (11.8)	78332 (100)
2012	1784 (2.9)	20606 (33.5)	26738 (43.5)	12332 (20.1)	61459 (100)
2005-08 (Avg.)	1000	15800	22550	983	40333
2009-12 (Avg.)	1828	22647	31883	8004	64363
2005-08 (CAGR)	-28.1	6.3	46.8	-2.3	22.3
2009-12 (CAGR)	-14.0	16.8	-1.2	44.5	8.9

Source: ADB (<http://www.adb.org/projects>).

Note: Figures in parentheses represent shares of respective year total.

There has been visible improvement in fund allocations to infrastructure projects in the IOR-ARC region. For instance, total infrastructure investment rose from US\$1637 million in 2003 to US\$4712 million in 2012 registering 188 per cent growth over the nine-year period. Compared to other regions, IOR-ARC stands much better in the recent years than the early 2000s in terms of the volume of investment in infrastructure projects. However, the current level of ADB support to the region is lower than its investments in EAS and SAARC regions. Within the IOR-ARC region, infrastructure investments are concentrated in the South Asian sub-region. Recently, a good number of projects are undertaken in the South East Asian region also (Table 12).

Table 12: Infra Sector Investment of ADB in Selected RTAS

(US\$ Million)

Region/RTA	Actual			CAGR	
	2003	2007	2012	2003-07	2008-12
ASEAN-10	75.7	2143.3	1883.0	130.7	16.5
EAS	2613.4	4566.9	5653.2	15.0	2.7
SAARC8	2206.1	3823.0	4842.8	14.7	1.3
IOR-ARC	1637.2	2334.7	4712.3	9.3	7.0
IOR-ARC (South Asia)	1637.2	2333.7	4334.4	9.3	7.8
IOR-ARC (South-East Asia)	-	1.0	378.0	-	-0.5

Source: ADB (<http://www.adb.org/projects>).

The ADB-funded infrastructure projects in the region are largely in the energy, transport and ICT sectors. In 2012, ADB allocations to the region are to the tune of US\$ 2783.5 million, US\$1463.8 million and US\$465 million for multisector, transport and ICT, and energy sector projects respectively. Within the energy sector, almost 70 per cent of total energy investments are in the large hydropower sector followed by electricity transmission and distribution. In the transport and ICT sector, road transport continues to attract the highest proportion of total sectoral investments (Table 13).

Table 13: ADB Infra Investment in Selected RTAS: Implemented Projects

(US\$ Million)

Region/RTA	Status	Actual			CAGR	
		2003	2007	2012	2003-07	2008-12
ASEAN-10	Approved	-	2114.6	1883.0	-	27.4
	Closed / Terminated	75.7	28.7	-	39.8	-
EAS	Approved	150.0	4533.8	5653.2	59.6	11.3
	Closed / Terminated	2463.4	33.1	-	-23.3	-
SAARC8	Approved	705.6	3730.4	4842.8	58.0	10.6
	Closed / Terminated	1500.4	92.6	-	-43.5	-
IOR-ARC	Approved	555.6	2253.9	4712.3	38.0	22.4
	Closed / Terminated	1081.6	80.8	-	-17.6	-
IOR-ARC (South Asia)	Approved	555.6	2253.9	4334.4	43.4	21.1
	Closed / Terminated	1081.6	79.8	-	-39.6	-
IOR-ARC (South-East Asia)	Approved	-	-	378.0	-	-
	Closed / Terminated	-	1.0	-	-	-

Source: ADB (<http://www.adb.org/projects>).

Table 14: Pattern of ADB Infrastructure Investments in IOR-ARC and Its Sub Regions: by Sub-Sectors

(US\$ Million)

Region/Sub-Region	Sector	Sub-Sector	2003	2007	2012
IOR-ARC	Energy	Conventional Energy	-	60.6 (4.0)	-
		Electricity Transmission and Distribution	279.6 (52.8)	710.0 (46.9)	150.0 (32.3)
		Energy Efficiency and Conservation	-	1.0 (0.1)	-
		Energy Sector Development	250.0 (47.2)	700.0 (46.2)	-
		Large Hydropower	-	41.9 (2.8)	315.0 (67.7)
		Pipelines	-	0.6 (0.04)	-
		Renewable Energy	-	-	-
		Sub-Total	529.6 (100)	1514.1 (100)	465 (100)
	Multisector	Multisector	-	0.3	2783.5
	Transport and ICT	ICT	-	-	-
		Rail Transport	-	131.0 (16.0)	0.6 (0.04)
		Road Transport	1107.1 (99.9)	388.6 (47.4)	1162.2 (79.4)
		Transport Management and Policies	-	-	301.0 (20.6)
Urban Transport		-	0.7 (0.1)	-	

		Water Transport	0.5 (0.04)	300.0 (36.6)	-	
		Sub Total	1107.6 (100)	820.3 (100)	1463.8 (100)	
IOR-ARC (South Asia)	Energy	Conventional Energy	-	60.6	-	
		Electricity Transmission and Distribution	279.6	710.0	150.0	
		Energy Efficiency and Conservation	-	1.0	-	
		Energy Sector Development	250.0	700.0	-	
		Large Hydropower	-	41.9	315.0	
		Pipelines	-	0.6	-	
		Renewable Energy	-	-	-	
			Sub Total	529.6 (100)	1514.1 (100)	465 (100)
	Multisector	Multisector	-	-	2708.5	
	Transport and ICT	ICT	-	-	-	
		Rail Transport	-	131.0 (16)	0.4 (0.03)	
		Road Transport	1107.1 (99.9)	388.6 (47.4)	1160.5 (99.9)	
		Transport Management and Policies	-	-	-	
Urban Transport		-	-	-		
Water Transport		0.5 (0.04)	300.0 (36.6)	-		
		Sub Total	1107.6 (100)	819.6 (100)	1160.9 (100)	
IOR-ARC (South-East Asia)	Energy	Electricity Transmission and Distribution	-	-	-	
		Energy Efficiency and Conservation	-	-	-	
		Energy Sector Development	-	-	-	
		Renewable Energy	-	-	-	
	Multisector	Multisector	-	0.3	75.0	
	Transport and ICT	Rail Transport	-	-	0.2 (0.07)	
		Road Transport	-	-	1.7 (0.6)	
		Transport Management and Policies	-	-	301.0 (99.3)	
		Urban Transport	-	0.7 (100)	-	
		Sub Total	0.7 (100)	302.9 (100)		

Source: ADB (<http://www.adb.org/projects>).

Note: Figures in parentheses represent percentage shares of sub-sector total.

**Table 15: Infrastructure Investment in IOR-ARC under the World Bank
Public Private Partnership (PPP Model)**

Region/ Sub-Region	Sector	Actual			CAGR	
		2003	2007	2011	2003-07	2008-11
IOR-ARC	Energy	7535	10566	22466	8.8	6.8
	Telecom	6598	18701	11085	29.8	-17.8
	Transport	2317	5640	17167	24.9	41.4
	Water & Sanitation	2	7	0	36.8	-
IOR-ARC (Africa)	Energy	2400	18	454	-70.6	30.3
	Telecom	2141	3412	3342	12.4	-4.1
	Transport	123	152	97	5.4	-
IOR-ARC (Middle East)	Energy	0	0	0	-	-
	Telecom	40	242	879	56.8	1.0
	Transport	0	0	0	-	-
	Water & Sanitation	0	0	0	-	-
IOR-ARC (South Asia)	Energy	920	10243	19019	82.7	13.4
	Telecom	2375	9904	4801	42.9	-24.4
	Transport	579	3925	17070	61.4	46.5
	Water & Sanitation	0	5	0	71.0	-
IOR-ARC	Energy	4215	305	2993	-48.1	-16.8

(South-East Asia)	Telecom	2042	5143	2063	26	-20.9
	Transport	1615	1563	0	-0.8	-
	Water & Sanitation	1	2	0	18.9	-

Source: World Bank (<http://www.worldbank.org/projects>).

Table 16: Region/RTA-Wise Distribution of World Bank-Financed Infrastructure Projects, 2003-12

(US\$ Million)

Region/ RTA	Actual			CAGR	
	2003	2007	2012	2003-07	2008-12
ASEAN-10	225.3	679.2	1887.5	31.8	17.1
	269.5	1188.3	220.0	44.9	-28.9
EAS	225.3	1099.2	3120.8	48.6	-0.3
	767.5	1956.7	220.0	26.4	-32.5
SAARC8	275.6	406.2	2575.7	10.2	1.6
	723.5	643.5		-2.9	24.2 [€]
IOR-ARC	225.3	648.1	4069.4	30.2	7.5
	1096.4	1879.6	215.0	14.4	-41.1
IOR-ARC (Africa)	-	404.5	1685.1	-	25.0
	450.0	237.6	15.0	-	-
IOR-ARC (Middle East)	-	-	61.0	-	32.2
	46.8	-	-	-	-
IOR-ARC (South Asia)	-	243.6	1377.7	-9.1 [*]	-10.6
	565.4	583.5	-	-19.1 [*]	-
IOR-ARC (South-East Asia)	225.3	-	945.6	-	51.0
	34.2	1058.5	200.0	135.9	-30.0

Source: World Bank (<http://www.worldbank.org/projects>).

Notes: '^{*}'- 2004-07; '[€]'- 2008-11.

Table 17: Region/RTA-Wise Distribution of Successful Infrastructure Projects Financed by the World Bank

(US\$ Million)

Region/ RTA	Actual			CAGR	
	2003	2007	2012	2003-07	2008-12
ASEAN-10	494.8	1867.4	2107.5	39.4	3.1
EAS	992.8	3055.9	3340.8	32.5	-5.7
SAARC8	999.1	1049.7	2575.7	1.2	-4.7
IOR-ARC	1321.7	2527.7	4284.4	17.6	-3
IOR-ARC (Africa)	450.0	642.1	1700.1	9.3	16.9
IOR-ARC (Middle East)	46.8		61.0	2.2 [*]	0.5
IOR-ARC (South Asia)	565.4	827.1	1377.7	10	-16.6
IOR-ARC (South-East Asia)	259.5	1058.5	1145.6	42.1	3.1

Source: World Bank (<http://www.worldbank.org/projects>).

Note: '^{*}'- 2003-06.

Overall, the volume of investments by the World Bank in infrastructure projects in the IOR-ARC region has grown significantly during 2003-12. This is reflected in an increase in total project finance including both active and closed projects. And, the current pattern of Bank financing of infrastructure in the region is very much comparable to the trends in other regions like ASEAN, EAS and SAARC.

7. Lessons from Other Regional Initiatives on Infrastructure

As discussed at length in the preceding sections, multi-country infrastructure assets are considered as regional public goods featuring potentially large volume of investments, diverse economic linkages, conflict over distribution of costs and benefits, and perverse incentives. Being a heterogeneous grouping, IOR-ARC presents wide disparities in terms of infrastructure development and access to vital infrastructure services. Since the region at present does not have any formal regional institutional mechanism for infrastructure development, it would be useful to draw lessons from the experiences of other regional economic communities (REC) on cross-border infrastructure projects with regard to identification, design, implementation, financing and other aspects. For this study, the experiences of ASEAN, EU and South America are examined and compared for formulating policies on regional infrastructure cooperation for the IOR-ARC region.

By and large, regional infrastructure projects serve multiple national and regional goals with emphasis on improving physical connectivity along the major economic corridors in the region. This involves the development of multi-modal transport networks including roads, railways, ports, airports, electricity, telecommunications and ICT infrastructure. The average impact of regional infrastructure on local economies has been profoundly stronger particularly in lowering trade and transaction costs, enlarging markets for local production, and bridging disparities in social development by creating additional jobs, poverty alleviation, township development, etc. While regional infrastructure projects in ASEAN, SADC, UNASUR and other regions are believed to have created a virtuous cycle of linkage between infrastructure and growth, the participating countries face a number of political, regulatory and institutional issues that need to be addressed properly for ensuring effective implementation of projects and reaping optimal economic gains. In that light, one aspect that appears quite striking is the idea of linking long-term infrastructure development plans to the medium-term national development strategies (WEF, 2010; SADC, 2012). At the micro-level, the cross-border infrastructure projects have achieved significant leads in meeting the tallest economic objective of expanding physical connectivity in different regions of the world (ADB, 2009).

As far as software issues of infrastructure projects are concerned, the experiences of other RECs suggest that the success of regional infrastructure projects is contingent upon the efficacy of regional institutions and harmonization of regulatory practices in the participating countries. The path that could enable productive translation of infrastructure investments to

economic growth requires a clear sequencing of intermediate channels eliminating inefficiency in systems and procedures, links investment priorities to local comparative advantages, invests in new technologies, and aligns infrastructure policies to the long-term competitiveness and sustainability parameters. This implies the importance of a prudent strategy for identification of infrastructure projects with greater potential for generating medium-term positive externalities in the region.

In the context of regional infrastructure, it is a daunting task to establish a proper institutional framework for rapid and smooth execution of projects. Besides project design and financing, one issue that is inextricably linked to the efficacy of institutional framework is the role and scope for private sector participation in the implementation of cross-border projects. In recent years, the private sector has played a catalytic role in complementing government resources and efforts in meeting the challenges of balanced regional infrastructure development. Some countries including Spain, Australia, China and Chile have successfully implemented a number of PPP-based infrastructure projects in the past even though the skepticism over the success of such projects remained very much in force (Bhattacharyay, 2010). In this connection, it is vital to bring operational efficiency by suitably distributing functions relating to project implementation between the public and the private sector based on their core competencies. On the wider issues of regulatory and institutional reforms, the practitioners' view favours a gradual and systematic transition from the traditional risk-averse government-led infrastructure policies and programmes to more sector-oriented and pragmatic approaches. This process may involve an overhauling of the national and regional infrastructure policies with respect to the role of public sector in identification and formulation of projects, exploring alternative modes of infrastructure finance, and establishing proper institutions and governance structures for transparent execution of infrastructure projects.

One issue that is central to all regional infrastructure projects is financing. It is widely felt that public resources comprising of ordinary tax revenues and other non-tax revenues are grossly inadequate to fund the growing demand for infrastructure in the developing and least developed regions. A possible way to bridge this gap is to explore innovative financing mechanisms involving both the public and the private sector, preferably in the PPP framework. Besides the size of investments in case of bankable projects, there is a need to widen the choice of financing instruments that could include a combination of public non-tax revenues, financing by the multilateral and regional development banks like the World Bank, ADB, AfDB, and institutional investors like pension funds, insurance companies, sovereign wealth funds and dedicated regional infrastructure funds.

At present, IOR-ARC does not have any specific policies and institutional framework for development of regional infrastructure. In view of varying

economic priorities and stages of development, the member states need to develop a holistic approach towards regional infrastructure development. In that context, it is imperative to draw lessons from other regions on different parameters of regional cooperation for conception and execution of cross-border infrastructure projects. Some of those include the Asian Highway, GMS projects in Asia, TEN-T projects in EU and IIRSA in South America. By and large, the existing framework in EU, Asia and Latin America presents a three-tier hierarchical structure comprising of a set of dedicated institutions entrusted with specialized tasks and responsibilities. On the top, it includes an apex official body (preferably within the secretariat of the concerned association or REC) responsible for planning, programme formulation and coordination of priority projects.

In the second tier, certain sector-specific or project-based bodies are created with clearly defined mandates for cost effective and timely execution of eligible projects in the priority sectors. The nature and functioning of the third tier institutions are not clearly spelled out in the projects implemented so far even though certain informal structures exist at local levels. However, these local institutions do play a crucial role in meeting various intermediary functions relating to project implementation. Four key functions are central to cross-border infrastructure projects: (a) planning, identification and formulation of priority projects, (b) financing of projects, (c) involvement of potential private players, and (d) continuous monitoring and evaluation of project costs and benefits.²⁹ Basically, regional cooperation takes many forms including intergovernmental dialogue, information exchange, the common provision of regional public goods, and regional institution building (ADB, 2009).

As mentioned above, the structure and nature of institutions for regional infrastructure projects varies from region to region depending on a host of factors that could possibly affect the project execution process. These may include the record of countries in managing large cross-border infrastructure projects in the past, the level of ideological and political harmony among the member states, the ease and extent of funding available for regional projects, local constraints (if any) in the form of social movements against land acquisition and other environmental issues.

7.1. TEN-T Projects in European Union

The European Union (EU) model is often viewed as a successful case of regional integration in the world. As regards regional infrastructure, the EU model presents interesting evidence on the successful planning and execution of cross-border infrastructure projects. Infrastructure development was not part of the regional integration scheme of EU in the initial stages during the 1960s and 1970s. Infrastructure investment was given importance only after introduction of the Delors-I package in 1988 which was devised for meeting certain long-term development goals including regional infrastructure. Besides

substantial fund allocations the Delors-I package introduced certain innovative project-based financing and transparent accounting system. This package not only succeeded in controlling the (possible) arbitrary use of EU funds by the member states but has also established a coordinated programme-based selection and financing of projects. Later, with the passage of the Maastricht Treaty in 1992, regional infrastructure projects became an integral part of the regional development agenda in the EU region. The Maastricht Treaty that aimed at addressing the issues of regional divergence envisioned a comprehensive policy called Delors-II package towards intra-regional and transnational infrastructure. It had raised the EU assistance to infrastructure projects significantly and paved the way for the creation of a unified and organized institutional structure in the form of Trans-European Networks (TEN).

TEN is a flagship initiative on infrastructure in the region comprising of a number of national and regional infrastructure projects in three major infrastructure sectors such as transport, energy and telecommunications. It was initiated in 1993 with an aim to develop a single multi-modal network integrating sea, land and air transportation in order to facilitate free movement of goods and people across the region. As part of the 'Europe 2020' strategy, a total of 30 projects have been identified as priority projects that are to be completed by 2020. Of those, 18 are railway projects, 3 are mixed rail-road projects, 2 are inland waterways transport projects and one is for motorways of the sea.³⁰

With regard to institutional framework, the experience of the EU countries offers valuable insights on efficient organization and delegation of tasks, modalities on fund mobilization and allocation of projects, policies on regional standards and regulations, and provisions and safeguards for meeting local constraints. The European Commission (EC), the apex official body, is responsible for the execution of TEN projects in different countries of the EU area. In initial years, the management of TEN projects was under the direct supervision of the EC. Subsequently, a new set of institutions was created at sector and project levels for the faster and cost effective implementation of priority projects. With growing complexity of projects, the EU, in principle, established an Executive Agency (EA) called the TEN-T EA in 2006 to separate programme implementation from policymaking and programme design. As per this arrangement, the EC would oversee the policy matters relating to identification, formulation and design of projects, and the EA would target funding and operational aspects of project implementation. Over the past six years, the TEN-T EA has performed its mandated tasks efficiently and is on a continuous learning track. Compared to the previous era, there has been significant improvement in the quality of services rendered by the TEN-T EA reflecting higher level of satisfaction among different project stakeholders and overall efficiency gains in operations.³¹

Besides having a function-based structure of institutions, the EU has a well-defined mechanism for financing infrastructure projects. TEN-T projects in general involve multiple layers of decision making structured on a function-based classification of autonomy and delegation. While there is merit in keeping the authority of policymaking and programme design with the EC, the relevance of having a separate agency for financing, execution and monitoring (TEN-T EA) needs to be judged from the perceived efficiency gains that it would generate compared to the counterfactual scenario. It required the merger of a number of sector-specific regional institutions into a coherent institutional framework. Interestingly, EU followed a well-coordinated and flexible approach towards regional infrastructure development by suitably combining the national and regional priorities. While doing so, the member states enjoyed sufficient freedom in identifying and implementing infrastructure projects with very little imposition from the EU institutions. In order to ensure scientific utilization of structural and cohesion funds, the regional institutions such as the TEN-T EA and EIB have appropriately intervened in overseeing the project execution for those projects where sufficient EU funding was involved. With regard to financing, member states were primarily responsible for raising resources for the projects implemented in their respective territories with or without EU funding. A large part of that EU funding was meant for the projects in the poorer member states.

In nutshell, EU provides an organized structure for identification, formulation, design and execution of infrastructure projects in the region. The essential features of the EU policy in infrastructure development are a clear policy on mobilization of financial resources, powers and jurisdiction over implementation of projects, proper delegation of administrative procedures relating to implementation of infrastructure projects and so on.

7.2. Initiative for the Integration of Regional Infrastructure in South America

Initiative for the Integration of Regional Infrastructure in South America (IIRSA) was established in 2000 as a flagship sub-regional initiative to spearhead the agenda of regional infrastructure development in South America. Twelve countries in the South American region are parties to this initiative and hold regular dialogue for effective conception, formulation and implementation of regional infrastructure projects. Unlike EU where policies on infrastructure development evolved in a gradualist fashion, IIRSA has a clear vision and an enabling institutional framework since inception to cater to various functions relating to project development and implementation. Most of the regional infrastructure projects are selected on the basis of consensus among the participating countries. In addition to priority projects, two other mechanisms namely the IIRSA Methodology for Analysis of the Productive Integration Potential and Development of Value Added Logistics Services and IIRSA Methodology for Strategic Environmental and Social Evaluation (EASE) played a key role in meeting the goals of the IIRSA. As of 2011, IIRSA portfolio has

covered 524 projects in the areas of transport, communications and energy. Of those, 8.8 per cent are completed projects, 47.7 per cent are in progress, and the rest 30 per cent are in different stages of preparation.

IIRSA functions through a number of institutions under the overall guidance and supervision of the Executive Steering Committee (ESC). The ESC is composed of high-level representatives from 12 countries and bears the responsibility of setting the vision, building consensus, and issue recommendations on the technical work done by the Executive Technical Groups (GTEs) and Technical Coordination Committee (CCT). GTEs have the mandate of analyzing and making recommendations on harmonization and standardization of regulatory and legal frameworks; methods to identify and evaluate projects; environmental, social and economic analyses of projects and hubs; and institutional mechanisms. On the other hand, the CCT provides managerial and operational support for IIRSA activities including support for the GTEs.

From time to time, IIRSA has emphasized upon the importance of continuing with a common approach towards infrastructure, transport, logistics and mobility policies as well as institutionalizing solutions for regional infrastructure asymmetries. The main challenge that has surfaced prominently in execution of regional infrastructure projects in South America is the lack of coordination among the member states on various aspects of project formulation and execution. To mitigate these problems, ECLAC proposes a paradigm shift from the current uncoordinated modal approach towards an integrated, sustainable and co-modal approach that integrates all the project objectives and processes in a holistic way. Interestingly, IIRSA has developed several tools to improve the process of project implementation that have significantly reduced the risk of slippages in construction schedules, environmental mitigation measures, and accurate cost estimates. This policy environment has favoured the private investors to invest in regional infrastructure projects in the IOR-ARC region.

In this regard, the report prepared by the Office of Evaluation and Oversight of the Inter-American Development Bank (IDB) presents interesting observations. By analyzing infrastructure lending trends during 2000-12, IDB observes that the demand for regional infrastructure projects has gone down gradually over time. Ironically, most of these IDB-financed regional projects are neither designed nor executed differently than national projects.³² Even in case of the two major initiatives such as IIRSA and PPP-PM there was hardly any noticeable shift in the lending pattern of regional projects. IDB expresses its concern by highlighting the perceived disincentive associated with the current strategy of infrastructure financing. To be more specific, it was observed that the demand for regional integration projects including infrastructure would unlikely to grow if specific incentives are linked to IDB project lending. In addition, IDB notices that regional integration projects involve high costs, longer execution time, and more vulnerable than national infrastructure projects which could probably be

the justification for the provision of additional incentives. IDB shares the experience of other regional and multilateral development banks such as the World Bank, AfDB and ADB that the demand for multinational projects would not increase unless some form of concessional loan or financing is involved.

7.3. Infrastructure Initiatives in Asia

Infrastructure has been an integral component of regional economic integration in Asia. Besides the support and financing by the World Bank, the ADB has adopted a comprehensive approach towards building cross-border infrastructure in order to bridge connectivity gaps in lagging parts of the region and exploit economic opportunities resulting from integration of regional and sub-regional production fragmentations. A good number of initiatives are currently underway in Asia for promotion and development of regional infrastructure in different sectors including roads, railways, ports, airports, telecommunications, power and logistics. Among the pan-Asian initiatives, the Asian Land Transport Infrastructure Development (ALTID) is a major initiative that was established in 1992 by the UNESCAP to develop an integrated network of highways, railways, ports and air ports linking Asia to select locations in Europe. It is comprised of three pillars: the Asian Highway, the Trans-Asian Railway, and the facilitation of land transport projects through intermodal transport terminals. Likewise, several sub-regional initiatives on infrastructure are conceived and implemented under the sub-regional integration processes including ASEAN, BIMP-EAGA, BIMSTEC, CAREC, GMS, IMT-GT, PIF, SAARC and SASEC.

7.4. Asian Highway

Initiated in 1959, the Asian Highway is a network of 141,000 kilometers of standardized international roads spread over 32 countries in Asia with links to Europe. The project made considerable progress in the first phase of the project, 1960-70. However, progress in project goals was badly affected due to suspension of financial assistance in 1975. Subsequently, UNESCAP at its forty-eight session held in 1992 endorsed it as one of three pillars of the Asian Land Transport Infrastructure Development (ALTID) comprising Asian Highway, Trans-Asian Railway and facilitation of land transport projects. The Intergovernmental Agreement on the Asian Highway Network came into force on July 4, 2005 with an aim to provide a coordinated plan for the development of highway routes of international importance to meet the need to promote and develop international road transport in Asia and with neighbouring regions. A sum of US\$26 billion has already been invested in the improvement and upgradation of the Asian Highway network.

8. Institutional Framework for Regional Infrastructure Development in the IOR-ARC Region

Infrastructure development will remain a key component of regional economic cooperation in the IOR-ARC region in the coming years as the member states intensify their efforts for deeper integration in trade and investment. At the same time, it is clear that the current state of infrastructure sectors vary significantly across the member states in terms of coverage, magnitude of investment, policy directions and priorities. In view of this perverse imbalance in infrastructure stock, it is imperative to envision a regional institutional framework for balanced development of infrastructure in the region. The proposed institutional framework envisages a four-tier structure with clear division of responsibilities and delegation of powers with respect to the various functions associated with conception and execution of infrastructure projects. In principle, this framework is based on the principles of efficient delegation, transparency and effective feedback mechanism (see Figure 8.1).

8.1. Tier I

8.1.1. Institutional Framework

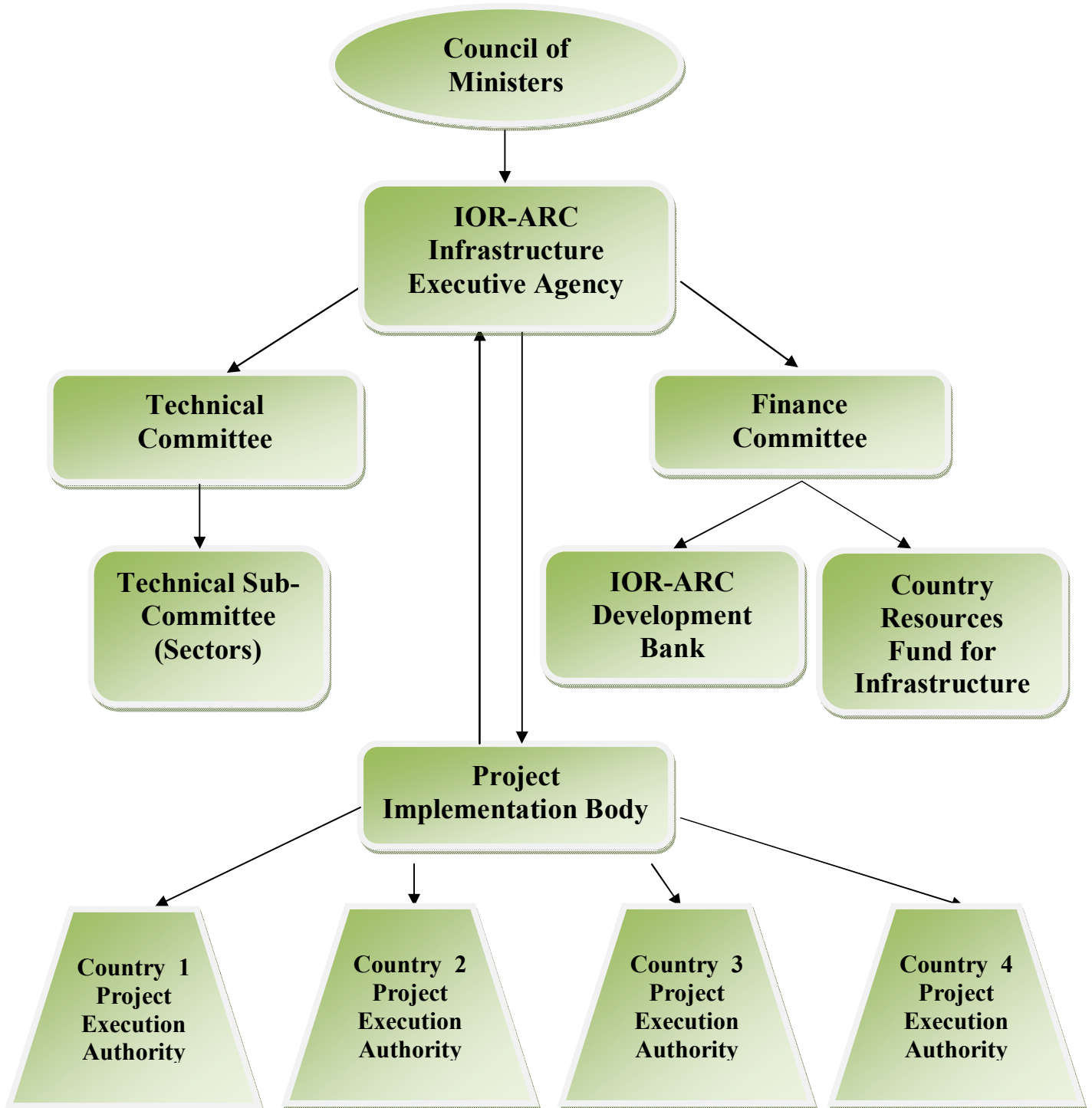
At Tier I, the Council of Ministers on Infrastructure (COMI) consisting of the ministers dealing with infrastructure portfolio of the member states will serve as the apex policymaking body on all matters relating to infrastructure development in the region. COMI would be headed by a Chairperson and four Vice-Chairpersons representing four sub-regions of the IOR-ARC region such as South Asia, South-East Asia, Middle East and Africa who are elected through the democratic processes. It is a permanent body vested with the powers to identify the priority sectors for infrastructure development, mobilize political will, set regional standards for harmonization of regulations, tariffs and user charges, developing framework for risk mitigation and measures for conflict management, and so on. It will constitute, advise and direct the IOR-ARC Infrastructure Executive Agency (IIEA) which will be held directly responsible for policy planning, project design, financing, and overseeing and monitoring of infrastructure projects and all other matters connected to execution of infrastructure projects. On top of it, COMI is expected to develop a broader long-term vision on infrastructure development in the region and the possible ways to confront the challenges in meeting this goal. It will have the supreme authority over the functioning of other three tiers and institutions operating at those tiers.

8.1.2. Financing

Since regional infrastructure projects involve large investments and multi-party stakeholders, financing is a challenging issue for the success of any regional

infrastructure project. In line with the global practice, IOR-ARC would promote a multi-source financing mechanism for infrastructure projects through a regional pool of resources drawn from membership contributions, grants from multilateral bodies and voluntary contributions by the members. As regards

Figure 8.1: Framework for Regional Cooperation in Infrastructure in IOR-ARC Region



membership contribution, the member states are required to make their contributions directly to the COMI. Grants from multilateral institutions may include concessional loans by the World Bank and other regional development banks e.g. ADB, AfDB, IADB, etc., and bilateral assistance by other non-member countries. All issues relating to mobilization and utilization of regional funds will be managed by the IIEA under the guidance and approval of the COMI. The COMI would direct the IIEA from time to time to formulate necessary guidelines on mobilization, allocation and management of the regional fund in consultation with the Finance Committee (FC). In addition, the COMI would bear the responsibility of promulgating the standards for sharing of resources among the participating members of a particular project in view of the asymmetric distribution of costs and benefits. In event of exceptional (project-specific) financing needs, COMI will devise the ways and means to raise funds from both traditional as well as innovative sources. While doing so, COMI may negotiate with the governments of the member states for sharing the additional burden of finances.

8.1.3. Sectors

The COMI has exclusive powers in the selection of infrastructure sectors and identification of priority projects in those sectors. In principle, the Council would engage the official representatives from the member states to deliberate on regional infrastructure priorities and formulate suitable policies in that direction. It is very likely that the identified projects in certain sectors could be of relevance to a few members or a sub-group of members implying the possible conflicts over financing and benefit sharing between the project members and other members. In that case, COMI is expected to enable the concerned members to reach amicable negotiations with the rest member states on finances and execution modalities so as to avoid conflicts of interests and provide the benefits of access to all the members in meeting their infrastructure needs. All modalities relating to the identification of sectors must *prima facie* seek the approval of COMI.

8.1.4. Linkages

Being the highest authority for regional infrastructure, COMI will have final say on all matters pertaining to conception and execution of infrastructure projects in the region. It essentially represents the official forum for appraisal, analysis and revision of existing approaches towards infrastructure development in the IOR-ARC countries. All institutions in the proposed institutional framework such as IIEA, TC, FC, IORDB, PIB, etc. may be asked to appraise the COMI regularly on the responsibilities and duties carried out by them during the project cycle.

8.2. Tier II

8.2.1. Institutional Framework

In the proposed framework, Tier II plays an important role in governance of the regional infrastructure projects. Tier II institutions are fully empowered to oversee, monitor and appraise the entire gamut of tasks and operations relating to project management that range from project formulation, design, feasibility analysis, financing and post-implementation issues. At this tier, IIEA is the lead executive body that directs and monitors the progress achieved in different project-related tasks assigned to other tier II institutions and the lower tiers. Besides IIEA, two specialized committees e.g. Technical Committee (TC) and Finance Committee (FC) will be formed to help assist IIEA in timely and efficient delivery of services relating to project execution. Both TC and FC are permanent bodies entrusted with the specialized tasks. TC is expected to deal with project design and engineering aspects, project appraisal, feasibility studies, and advising the IIEA on inclusion of new infrastructure projects in the regional infrastructure portfolio and/or extension/termination of existing projects. On the other hand, FC carries the responsibility of all matters relating to funding of projects, bidding and tenders related issues and PPP modalities.

8.2.2. Financing

Under the overall supervision of IIEA, FC would disburse funds to the Project Implementation Body (PIB) operating at tier III and oversee fund utilization at tier III & IV during the project life cycle. It is expected to extend all possible support to PIB in handling the bidding process, inviting tender and selection of private stakeholders for infrastructure projects in the region. Further, FC must prepare a roadmap for risk sharing between the member states and a clear scheme of risk mitigation in event of the demand for additional funds for meeting unforeseen contingencies.

8.2.3. Sectors

The role of Tier II institutions e.g. TC and FC is important for identification of sectors that are considered vital to infrastructure development in the region. While the onus rests on COMI for identification of the broad sectors that are considered vital to regional infrastructure development, it is the primary duty of TC and FC to prepare a list of priority projects by mapping the specific targets and time periods to be achieved over the implementation period. In this connection, the role of TC in undertaking technical feasibility, ensuring compatibility with national development strategies and assessment of probable risks and vulnerabilities associated with multi-country infrastructure projects.

8.2.4. Linkages

Tier II plays an important intermediary role between the highest authority and the field level execution bodies. Within their respective jurisdictions, TC and FC

will be held accountable to IIEA and COMI in meeting the operational targets set for different stages of the project life cycle. Besides carrying the task of completing the current projects, FC and TC would be required to engage in the long-run planning of physical infrastructure development in the region based on the emerging patterns in demand and supply trends.

8.2.5. Technical Committee

Basically, TC is responsible for handling the technical matters concerning project design and engineering. Given the complex nature of regional infrastructure projects involving multiple countries and unequal distribution of costs and benefits, the TC will be required to undertake feasibility studies of the projects under consideration especially in light of their potential contribution to economic growth in the region. In addition, TC may be asked to conduct regular assessment of the emerging infrastructure fields which have better investment prospects. While TC will have its own experts in different sectors, it possesses the powers to nominate external consultants for assisting the Committee in undertaking any specialized studies and assessments. If necessary, TC may exercise its discretion in forming the sub-committees for different infrastructure sectors which will serve as ad-hoc bodies for a defined duration with specific mandates.

8.2.6. Finance Committee

FC will serve as a permanent body of the IOR-ARC regional infrastructure development initiative. The primary responsibility would be to deal with all finance related issues involved with planning and execution of regional infrastructure projects. The operations of FC will be facilitated by its two wings: (a) IOR-ARC Development Bank (IORDB) and (b) Country Resources Fund for Infrastructure (CRF). CRF will constitute a regional pool of funds contributed by the member states towards infrastructure development in the IOR-ARC region. The amount of contribution by the members may differ depending on their relative economic position and as per the norms and standards agreed upon by the COMI. FC will be primarily responsible for mobilizing funds from the members and facilitate disbursements to the concerned institutions at tier III and IV for execution of all identified projects in a given time period. Unlike CRF, the role and functions of IORDB would be slightly different. It will begin its operations with the paid-up capital drawn from the CRF or through a special contribution drive by the member states as seed capital for the IORDB. Primarily, IORDB will supplement CRF in funding infrastructure projects in the region. Subsequently, it may commercialize its operations by expanding into select value-added services including consultancy services, fund raising for commercial enterprises, and project feasibility. Based on its performance, IORDB might raise funds from the market by issuing long-term bonds so as to cater to the growing demands for long-term financing. It would not only expand the scope for undertaking large and innovative infrastructure projects

in the future but would strive for strengthening the commercial viability of the existing regional infrastructure assets especially in post-implementation repair and maintenance services.

8.3. Tier III

8.3.1. Institutional Framework

Tier III plays a very crucial role in the project execution process. It carries the entire responsibility of meeting all kinds of tasks at the field level in connection with the project implementation process. As per the proposed structure, the Project Implementation Body (PIB), a permanent body within the family of institutions for regional infrastructure, would carry out all activities concerning project execution such as assisting the IIEA in meeting the targets and possible revision of project timelines and procedures, liasioning and coordination with country project execution authorities, providing regular feedback on the progress in field parameters, and compliance to any other policy directives from the IIEA. In the IOR-ARC framework, the scope for direct interaction between the apex executive body, IIEA, and the field execution authority, PIB, has been broadened and encouraged so as to gain operational efficiency and timely completion of the important projects.

Liasioning with country project execution authorities is vital to the successful functioning of PIB. As the coverage, risk sharing and financial contributions in regional infrastructure projects differ across the member states, the probability of low motivation and risk of non-cooperation cannot be entirely ruled out. In view of this structural asymmetry, the role of PIB would remain crucial for the successful completion of cross-border infrastructure projects. In particular, PIB would appraise IIEA regularly on the progress made with respect to fund utilization, consolidated picture on country responses, and the challenges faced by the country execution authorities.

8.3.2. Financing

At Tier III, financing involves actual spending of money allocated to different components of project execution. IIEA would advise FC to disburse funds to PIB directly in order to meet all kinds of payments at the field level. In subsequent phase, PIB may distribute those funds among the country execution authorities to meet financing requirements of the project work falling in their respective territories. As the coverage area and project costs vary across the participating countries, the allocation of funds to the member states would be different. Any demand for additional funding arising from country-specific problems e.g. security threats should be borne by the respective member states. Under special circumstances, if there is a genuine demand for regional funding to meet those types of additional spending requirement by any member state, the matter should be left to COMI for assessment and final decision.

Another important task of Tier III institutions is to formulate and develop a workable scheme for the Public-Private Partnership (PPP) mode of project management. The key element of PPP is to identify the suitable private players with credible track record of participation to be the partners in regional infrastructure projects. FC would work closely with PIB in seeking competitive bidding and establishing transparent operational modalities in PPP-based projects.

8.3.3. Sectors

PIB will remain as the single regional institution with the responsibility of project execution at the field level catering to projects in all infrastructure sectors, unless reservations for certain specific sectors are stipulated in the agreed terms and conditions.

8.3.4. Linkages

In the current institutional structure, Tier III serves as the vital link point between the apex policymaking bodies and the country-level execution authorities. In that sense, PIB could play a key role in regional infrastructure development in the region not only as an implementing body for the current projects but also as a treasure house of learning and experience for formulating new and innovative projects in the future.

8.4. Tier IV

8.4.1. Institutional Framework

At tail-end of the institutional structure, Tier IV represents the country project execution authorities that are primarily responsible for undertaking activities concerning those parts of the projects that fall in their geographical territories. It would not be suffice to visualize country-level project execution authorities as low-key players in the hierarchy of roles assigned to different institutions in the project implementation process. In addition, these bodies could serve as country nodal points for inputs on various aspects of infrastructure development particularly in the areas of sectoral priorities, challenges in financing, implementing capacity and other issues.

8.4.2. Financing

As per the guidelines envisaged, Tier IV would not have automatic access to the regional pool of IOR-ARC funds. In special circumstances, the IIEA in consultation with the COMI may allocate some funds if the provision of structural or cohesion fund (as exists in EU) is applicable to the less developed member states in the region.

8.4.3. Sectors

By mandate, country project execution authorities will not discriminate between different sectors while taking part in the regional infrastructure projects.

8.4.4. Linkages

In cross-country projects, the importance of country project execution authorities would remain high. The timely and healthy coordination among these bodies is the key to successful completion of infrastructure projects. As the evidence of non-cooperation by some participating countries in regional infrastructure projects is well-known in other regions, there is a need to ensure proper communication and feedback among the country project execution authorities.

9. Conclusions and Policy Recommendations

The study deals with three core issues concerning regional infrastructure in the region pertaining to (a) consolidated understanding on the role and importance of regional physical infrastructure in economic growth and development, (b) examining the trends in infrastructure investments in the region and suggest future roadmap and (c) developing an institutional framework for infrastructure development with respect to governing procedures, financing, operations and coordination. Broadly, the study aims at stimulating policy debates on the abovementioned issues among various stakeholders in the IOR-ARC region and provides alternatives to address the challenges identified in different components of execution of regional infrastructure projects.

Interesting lessons and feedback are suitably drawn from similar arrangements in other regions such as ASEAN, EU and Latin America and adapted to the IOR-ARC requirements. The study situates TEN-T as the most organized and successful regional initiative for development of cross-border infrastructure in the EU region. By having a collective pool of resources at the disposal of a number of EU institutions with clearly defined mandates and responsibilities, the member states have made significant headway in the 2000s in building and managing cross-border infrastructure assets in railways, telecommunications and energy sectors. Some of those features that are found relevant for this study include the institutional framework which envisages a network of institutions with clear separation of power and duties in the major components of project development cycle e.g. project formulation, design and engineering, finance and execution. Likewise, the IIRSA in South America has followed a novel approach of identifying a pool of priority projects by taking into account the specific infrastructure needs of the participating countries. As per this system, the selection of priority projects is decentralized and considers the concerns of individual member countries irrespective of their economic status. IOR-ARC with heterogenous members borrows the essential features of this practice while conceptualizing a regional institutional framework for infrastructure development. The successful execution of cross-border infrastructure projects in ASEAN provides rich inputs for replication especially on the pan-Asian initiatives such as the Asian Highways and the sub-regional initiatives in the Greater Mekong Subregion, BIMSTEC, SAARC, and so on.

By incorporating some of these features, the study proposes a four-tier institutional framework with specific recommendations on various aspects of regional infrastructure:-

Identification and Formulation of Projects

- Given large differences in stock of and access to various kinds of physical infrastructure in the region, IOR-ARC needs to prepare a set of priority projects with a long-term perspective which are to be implemented over the project horizon.
- Member countries should appropriately put the request for any country-specific projects before the Council of Ministers on Infrastructure (COMI) to be considered for inclusion in the list of priority projects.
- Emphasis should be given to projects with potential for reasonable degree of regional impact measured in terms of improvement in connectivity, trade promotion, income and employment generation, etc.

Financing

- As regional infrastructure projects involve large budgets and multiple stakeholders, funds for the eligible projects should be drawn from multiple sources consisting of public resources, loans from the regional and multilateral development banks, and bonds and securities from the private capital market.
- Financing through Public Private Partnership (PPP) may be encouraged so as to enable sharing of risks, expertise and technology between the government agencies and the private sector entities.
- As far as possible, voluntary contributions from the member countries other than their membership contributions to the IOR-ARC regional fund are highly encouraged.

Execution of Projects

- For timely and effective implementation of projects, the IIEA should be given adequate authority pertaining to decisions regarding operations and financing. This would enable faster clearance of execution formalities and build confidence in the lower tiers of institutions.
- As delays in project execution due to unrelated events e.g. political uprising, civil war, etc. are likely in multi-country infrastructure projects, there should be sufficient flexibility in the hands of IIEA and project implementation body at Tier III to continue the ongoing work in the unaffected parts of the project territory.

- A proper communication and feedback mechanism need to be established among the institutions/personnel operating at all the four tiers in order to reduce frictions and avoid mutual distrust arising from delays, inadequate coverage and other issues.
- Country execution authorities need to be empowered to take responsibility for smoother and effective execution of projects and help the IIEA in revising and/or modifying their operating strategies.

Endnotes

- ¹ In the 11th Meeting of the Council of Ministers of IOR-ARC Bengaluru Communique, November 5, 2011, the importance of infrastructure and trade facilitation in IOR-ARC member states was emphasized. As per the ADB (2009) estimates, Asia needs an investment of approximately US\$ 8 trillion in overall national infrastructure and US\$ 290 billion in specific infrastructure projects, amounting to US\$ 750 billion per year over the period from 2010 to 2020.
- ² Mohanty and Dash (2011).
- ³ Mohanty and Dash (2011).
- ⁴ 'Core' refers to the regions/production centres that are well-connected and facilitates large part of domestic economic transactions.
- ⁵ For a thorough description of these issues, see ECLAC-UNASUR (2012).
- ⁶ The dynamics in cross-border infrastructure investments can be explained by three theoretical paradigms such as the theory of public good, game theory and incomplete contract theory (see Fung, Garcia-Herrero and Ng (2011)).
- ⁷ See UNESCAP (2004).
- ⁸ See APEC (2011).
- ⁹ The 2011 Supply Chain Foresight Survey identifies road as the dominant mode for freight transport in South Africa.
- ¹⁰ See Republic of Kenya (2012).
- ¹¹ See Govt. of India, DIPP.
- ¹² See Govt. of South Africa and DBSA.
- ¹³ See O'Leary, Charpentier and Minogue (1998); Economic Consulting Associates (2009) and World Bank (2005).
- ¹⁴ See APEC (2012).
- ¹⁵ See Govt. of South Africa (2008).
- ¹⁶ See UNASUR (2012).
- ¹⁷ See AfDB (2011), Southern Africa Regional Integration Strategy Paper, 2011-15.
- ¹⁸ See *Trade Policy Reviews (Various Years)*.
- ¹⁹ See ADB (2013).
- ²⁰ See AICD-Kenya (2010).
- ²¹ See AICD-Mozambique (2011).
- ²² Coppock and Maclay (2002) observe two basic e-commerce models that are in practice today. One is the government-led and highly structured approach followed in EU, and the other is the bottom up and self-regulating approach followed in the United States and APEC.
- ²³ CAGR.
- ²⁴ The world would need an annual investment of over US\$2 trillion every year for meeting the demand for infrastructure (WEF, 2010).
- ²⁵ More than 55 per cent of private FDI flows to the Brazil, Russia, India and China (BRIC) during the period 1990-2010 are greenfield projects (Kateja, 2012).
- ²⁶ By drawing experiences from Africa, AfDB (2011) observes the continued importance of government in design and execution of infrastructure projects.
- ²⁷ See *Economic Times*, February 27, 2013.
- ²⁸ See *RIS Policy Briefs No. 49 & 53*.
- ²⁹ In addition to financing, the important components of policies and institutions for regional infrastructure development include coordinating, identifying, prioritizing, preparing viable projects; developing appropriate regulatory policies and legal frameworks; strengthening capacity building programs; encouraging private sector participation; managing social and environmental problems; and promoting good governance (ADB, 2009, pp.120).
- ³⁰ European Commission (2008), TEN-T Trans-European Transport Network.....
- ³¹ See COWI (2012).
- ³² See IDB (2013).

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Annexure I

Pattern of ADB Infrastructure Investment in IOR-ARC and Its Sub-Regions: by Type of Financing in Sub-Sectors (US\$ Million)

Region/Sub-Region	Type	Sector	Sub-Sector	2003	2007	2012	
IOR-ARC	Grant	Multisector	Multisector	-	-	-	
	Loan	Energy	Conventional Energy	-	60.0	-	
		Energy	Electricity Transmission and Distribution	279.6	-	-	
		Energy	Energy Sector Development	250.0	405.0	-	
		Energy	Pipelines	-	-	-	
		Energy	Renewable Energy	-	-	-	
		Multisector	Multisector	-	-	485.9	
		Transport and ICT	Rail Transport	-	-	-	
		Transport and ICT	Road Transport	1106.0	338.6	709.5	
		Transport and ICT	Water Transport	-	300.0	-	
	MFF	Energy	Electricity Transmission and Distribution	-	710.0	150.0	
		Energy	Energy Sector Development	-	295.0	-	
		Energy	Large Hydropower	-	41.9	315.0	
		Multisector	Multisector	-	-	1439.0	
		Transport and ICT	Rail Transport	-	130.0	-	
		Transport and ICT	Road Transport	-	50.0	252.0	
	TA	Energy	Conventional Energy	-	0.6	-	
		Energy	Electricity Transmission and Distribution	-	-	-	
		Energy	Energy Efficiency and Conservation	-	1.0	-	
		Energy	Energy Sector Development	-	-	-	
		Energy	Large Hydropower	-	-	-	
		Energy	Pipelines	-	0.6	-	
		Energy	Renewable Energy	-	-	-	
		Multisector	Multisector	-	0.3	858.6	
		Transport and ICT	ICT	-	-	-	
		Transport and ICT	Rail Transport	-	1.0	0.6	
		Transport and ICT	Road Transport	1.1	-	200.7	
		Transport and ICT	Transport Management and Policies	-	-	301.0	
		Transport and ICT	Urban Transport	-	0.7	-	
	Transport and ICT	Water Transport	0.5	-	-		
	IOR-ARC (South Asia)	Grant	Multisector	Multisector	-	-	-
		Loan	Energy	Conventional Energy	-	60.0	-
Energy			Electricity Transmission and Distribution	279.6	-	-	
Energy			Energy Sector Development	250.0	405.0	-	
Energy			Pipelines	-	-	-	
Energy			Renewable Energy	-	-	-	
Multisector			Multisector	-	-	410.9	
Transport and ICT			Rail Transport	-	-	-	
Transport and ICT			Road Transport	1106.0	338.6	709.5	
Transport and ICT			Water Transport	-	300.0	-	
MFF		Energy	Electricity Transmission and Distribution	-	710.0	150.0	
	Energy	Energy Sector Development	-	295.0	-		

		Energy	Large Hydropower	-	41.9	315.0
		Multisector	Multisector	-	-	1439.0
		Transport and ICT	Rail Transport	-	130.0	-
		Transport and ICT	Road Transport		50.0	252.0
	TA	Energy	Conventional Energy		0.6	
		Energy	Electricity Transmission and Distribution			
		Energy	Energy Efficiency and Conservation		1.0	
		Energy	Energy Sector Development			
		Energy	Large Hydropower			
		Energy	Pipelines		0.6	
		Energy	Renewable Energy			
		Multisector	Multisector			858.6
		Transport and ICT	ICT			
		Transport and ICT	Rail Transport		1.0	0.4
		Transport and ICT	Road Transport	1.1		199.0
Transport and ICT	Transport Management and Policies					
Transport and ICT	Urban Transport					
Transport and ICT	Water Transport	0.5				
IOR-ARC (South-East Asia)	Grant	Multisector	Multisector			
	Loan	Energy	Electricity Transmission and Distribution			
		Energy	Renewable Energy			
		Multisector	Multisector			75.0
	MFF	Transport and ICT	Road Transport			
		Multisector	Multisector			
	TA	Energy	Electricity Transmission and Distribution			
		Energy	Energy Efficiency and Conservation			
		Energy	Energy Sector Development			
		Multisector	Multisector		0.3	
		Transport and ICT	Rail Transport			0.2
		Transport and ICT	Road Transport			1.7
Transport and ICT		Transport Management and Policies			301.0	
Transport and ICT	Urban Transport		0.7			

Annexure II

Sector-Wise Distribution of World Bank-Financed Infrastructure Projects in IOR-ARC and Its Sub-Regions

(US\$ Million)													
RTA	Sector	Status	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
IOR-ARC	Aviation	Active	-	207	-	-	-	190	253	305	359	-	
	Aviation	Closed	150	420	-	-	75	200	-	-	-	-	
	Telecommunications	Active	-	53	-	-	-	-	1.87	255	315	11	
	Telecommunications	Closed	26.22	220	200	-	200	400	250	200	-	115	
	General Communication	Active	-	-	-	200	23.6	-	-	1.1	35	55.1	
	General Communication	Closed	-	-	-	-	0	0.4	-	-	-	-	
	Electricity	Active	141	80	-	100	204.5	1390	1535	4535	27.9	-	
	Electricity	Closed	-	15.5	-	400	425	420	-	315	-	-	
	Highways Rural	Active	84.3	575.7	500	508	320	687.1	968	2494.3	1635.8	2090.7	
	Highways Rural	Closed	688	1019.5	-	98	923.5	506.2	300	848.7	1232.7	-	
	IT	Active	-	53	-	-	-	-	-	-	196.4	201	
	IT	Closed	23.4	68.4	-	30	-	-	50	0.04	550	-	
	Ports	Active	-	-	25	8.3	-	-	100	257	59	302	
	Ports	Closed	150	200	-	142	2	-	-	115	-	-	
	Rail	Active	-	-	-	-	-	-	353	430	975	300	
	Rail	Closed	-	232	-	40	15.6	-	-	-	-	-	
	Thermal	Active	-	80	-	-	-	-	354	-	-	-	166
	General Transport	Active	-	-	129.8	-	-	-	1195	379	224	730.6	
	General Transport	Closed	58.7	45.2	168.2	-	208.5	255.7	250	201	-	100	
	Transport Urban	Active	-	-	45	424	100	427.7	922.8	420	-	213	
Transport Urban	Closed	-	52	-	-	30	-	-	42	-	-		
IOR-ARC (Africa)	Aviation	Active	-	207	-	-	-	190	253	270	359	-	
	Aviation	Closed	150	-	-	-	-	-	-	-	-	-	
	Telecommunications	Closed	-	-	-	-	-	-	-	-	-	15	
	General Communication	Active	-	-	-	-	-	-	1.1	-	55.1		
	General Communication	Closed	-	-	-	-	-	0.4	-	-	-		
	Electricity	Active	-	80	-	-	204.5	40	80	4310	27.9	-	
	Electricity	Closed	-	-	-	-	-	-	115	-	-		
	Highways Rural	Active	-	357	-	-	100	230	303	270	341	404	
	Highways Rural	Closed	150	-	-	98	190	220	-	-	-	-	
	IT	Active	-	-	-	-	-	-	-	-	1.4	120	
	IT	Closed	-	-	-	30	-	-	50	0.04	-	-	
	Ports	Active	-	-	-	-	-	-	-	-	59	-	
	Ports	Closed	150	-	-	-	2	-	-	115	-	-	
	Rail	Active	-	-	-	-	-	-	253	-	-	300	
	Rail	Closed	-	232	-	-	15.6	-	-	-	-	-	
	Thermal	Active	-	80	-	-	-	-	-	-	-	-	166
	General Transport	Active	-	-	129.8	-	-	-	-	100	101.5	640	
	General Transport	Closed	-	-	-	-	-	0.4	-	-	-	-	
	Transport Urban	Active	-	-	-	-	100	230	-	213	-	-	
	Transport Urban	Closed	-	52	-	-	30	-	-	-	-	-	
IOR-ARC (Middle East)	Aviation	Active	-	-	-	-	-	-	-	35	-	-	
	Aviation	Closed	-	220	-	-	-	-	-	-	-	-	
	Telecommunications	Closed	-	220	-	-	-	-	-	-	-	-	
	General Communication	Active	-	-	-	-	-	-	-	-	35	-	

	Electricity	Active	-	-	-	50	-	-	25	-	-	-
	Highways Rural	Active	-	-	40	-	-	-	75	-	-	-
	Highways Rural	Closed	-	-	-	-	-	10	-	-	-	-
	IT	Closed	23.4	-	-	-	-	-	-	-	-	-
	Ports	Active	-	-	25	-	-	-	-	35	-	-
	General Transport	Active	-	-	-	-	-	-	-	22	-	61
	General Transport	Closed	23.4	45	-	-	-	29.8	-	-	-	-
	Transport Urban	Active	-	-	-	-	-	20	-	57	-	-
IOR-ARC (South Asia)	Aviation	Closed	-	-	-	-	75	200	-	-	-	-
	Telecommunications	Active	-	53	-	-	-	-	-	255	315	11
	Telecommunications	Closed	9.12	-	200	-	-	200	-	-	-	-
	General Communication	Active	-	-	-	200	23.6	-	-	-	-	-
	General Communication	Closed	-	-	-	-	0	-	-	-	-	-
	Electricity	Active	-	-	-	50	-	1350	1330	-	-	-
	Electricity	Closed	-	15.5	-	400	225	220	-	-	-	-
	Highways Rural	Active	-	218.7	460	300	220	457.1	490	2145	499.5	770.7
	Highways Rural	Closed	538	1019.5	-	-	275	45	-	63.7	1200	-
	IT	Active	-	53	-	-	-	-	-	-	195	81
	IT	Closed	-	68	-	-	-	-	-	-	150	-
	Ports	Active	-	-	-	-	-	-	-	221.96	-	302
	Ports	Closed	-	-	-	-	-	-	-	-	-	-
	Rail	Active	-	-	-	-	-	-	-	430	975	-
	Rail	Closed	-	-	-	40	-	-	-	-	-	-
	Thermal	Active	-	-	-	-	-	350	-	-	-	-
	General Transport	Active	-	-	-	-	-	-	1195	257	121.75	-
	General Transport	Closed	18.24	-	-	-	8.45	25.5	-	1	-	-
	Transport Urban	Active	-	-	-	216	-	-	807.76	-	-	213
	Transport Urban	Closed	-	-	-	-	-	-	-	42	-	-
IOR-ARC (South-East Asia)	Aviation	Closed	-	200	-	-	-	-	-	-	-	-
	Telecommunications	Active	-	-	-	-	-	-	1.87	-	-	-
	Telecommunications	Closed	17.1	-	-	-	200	200	250	200	-	100
	General Communication	Closed	-	-	-	-	0	-	-	-	-	-
	Electricity	Active	141	-	-	-	-	-	100	225	-	-
	Electricity	Closed	-	-	-	-	200	200	-	200	-	-
	Highways Rural	Active	84.29	-	-	208	-	-	100	79.3	795.29	916
	Highways Rural	Closed	-	-	-	-	458.5	231.19	300	785	32.7	-
	IT	Closed	-	0.37	-	-	-	-	-	-	400	-
	Ports	Active	-	-	-	8.3	-	-	100	-	-	-
	Ports	Closed	-	200	-	142	-	-	-	-	-	-
	Rail	Active	-	-	-	-	-	-	100	-	-	-
	Rail	Closed	-	-	-	-	-	-	-	-	-	-
	Thermal	Active	-	-	-	-	-	4	-	-	-	-
	General Transport	Active	-	-	-	-	-	-	-	-	0.73	29.6
	General Transport	Closed	17.1	0.18	168.2	-	200	200	250	200	-	100
	Transport Urban	Active	-	-	45	208	-	177.68	115	149.98	-	-

Source: World Bank (<http://www.worldbank.org/projects>).

Annexure III

Sector-Wise Distribution of Successful Infrastructure Projects Financed by the World Bank in Different Regions/RTAs (US\$ Million)

Region/RTA	Sector	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
IOR-ARC	Aviation	150	627	-	-	75	390	253	305	359	-	
	Telecommunications	26.2	273	200	-	200	400	251.9	455	315	126	
	Telecommunications	-	-	-	200	23.6	0.4	-	1.1	35	55.1	
	Electricity	141	95.5	-	500	629.5	1810	1535	4850	27.9	-	
	Highways Rural	772.3	1595.2	500	606	1244	1193.3	1268	3343	2868.5	2090.7	
	IT	23.4	121.4	-	30	-	-	50	0.04	746.4	201	
	Ports	150	200	25	150.3	2	-	100	372.0	59	302	
	Rail	-	232	-	40	15.6	-	353	430	975	300	
	Thermal	-	80	-	-	-	-	354	-	-	-	166
	General Transport	58.7	45.2	298	-	208.5	255.7	1445	580	224.0	830.6	
Transport Urban	-	52	45	424	130	427.7	922.8	462.0	-	213		
IOR-ARC (Africa)	Aviation	150	207	-	-	-	190	253	270	359	-	
	Telecommunications	-	-	-	-	-	-	-	-	-	15	
	General Communication	-	-	-	-	-	0.4	-	1.1	-	55.1	
	Electricity	-	80	-	-	204.5	40	80	4425	27.9	-	
	Highways Rural	150	357	-	98	290	450	303	270	341	404	
	IT	-	-	-	30	-	-	50	0.04	1.4	120	
	Ports	150	-	-	-	2	-	-	115	59	-	
	Rail	-	232	-	-	15.6	-	253	-	-	300	
	Thermal	-	80	-	-	-	-	-	-	-	166	
	General Transport	-	-	129.8	-	-	0.4	-	100	101.5	640	
Transport Urban	-	52	-	-	130	230	-	213	-	-		
IOR-ARC (Middle East)	Aviation	-	220	-	-	-	-	-	35	-	-	
	Telecommunications	-	220	-	-	-	-	-	-	-	-	
	General Communication	-	-	-	-	-	-	-	-	35	-	
	Electricity	-	-	-	50	-	-	25	-	-	-	
	Highways Rural	-	-	40	-	-	10	75	-	-	-	
	IT	23.4	-	-	-	-	-	-	-	-	-	
	Ports	-	-	25	-	-	-	-	35	-	-	
	General Transport	23.4	45	-	-	-	29.8	-	22	-	61	
Transport Urban	-	-	-	-	-	20	-	57	-	-		
IOR-ARC (South Asia)	Aviation	-	-	-	-	75	200	-	-	-	-	
	Telecommunications	9.1	53	200	-	-	200	-	255	315	11	
	Telecommunications	-	-	-	200	23.6	-	-	-	-	-	
	Electricity	-	15.5	-	450	225	1570	1330	-	-	-	
	Highways Rural	538	1238.2	460	300	495	502.1	490	2208.7	1699.5	770.7	
	IT	-	121	-	-	-	-	-	-	345	81	
	Ports	-	-	-	-	-	-	-	222.0	-	302	
	Rail	-	-	-	40	-	-	-	430	975	-	
	Thermal	-	-	-	-	-	350	-	-	-	-	
	General Transport	18.2	-	-	-	8.5	25.5	1195	258	121.8	-	
Transport Urban	-	-	-	216	-	-	807.8	42	-	213		
IOR-ARC (South-East Asia)	Aviation	-	200	-	-	-	-	-	-	-	-	
	General Communication	17.1	-	-	-	200	200	251.9	200	-	100	
	General Communication	-	-	-	-	0	-	-	-	-	-	
	Electricity	141	-	-	-	200	200	100	425	-	-	
	Highways Rural	84.3	-	-	208	458.5	231.2	400	864.3	828.0	916	
	IT	-	0.4	-	-	-	-	-	-	400	-	
	Ports	-	200	-	150.3	-	-	100	-	-	-	
	Rail	-	-	-	-	-	-	100	-	-	-	
	Thermal	-	-	-	-	-	4	-	-	-	-	
	General Transport	17.1	0.2	168.2	-	200	200	250	200	0.7	129.6	
Transport Urban	-	-	45	208	-	177.7	115	150.0	-	-		

Source: World Bank (<http://www.worldbank.org/projects>).

Annexure IV

Regional and Sub-Regional Initiatives on Infrastructure Development

Name of Initiative	Year of Implementation	Countries covered	Objectives	Focus Sectors
Asian Land Transport Infrastructure Development	1992			Transport
Asia-wide integrated energy system linking and synergizing subregional energy systems	2006			
ASEAN Power Grid				
Trans-ASEAN Gas Pipeline				
ASEAN Highway network				
Singapore-Kunming Rail Link				
BIMSTEC Trilateral Highway project	2004	India, Myanmar, Thailand	To improve transport links and promote trade and tourism	Transport
GMS Economic Cooperation program			Improving connectivity	Transport, energy and telecommunication
Indonesia-Malaysia-Thailand Growth Triangle(IMT-GT)		Indonesia, Malaysia, Thailand	to expand trade and investment opportunities through improved connectivity	
Pacific Plan for strengthening Regional Cooperation and Integration	2005		To expand trade in goods and services	
SASEC information highway project	2007		To develop, utilize and optimize power links	Transport and energy
West Africa Power pool		Cote d'Ivoire, Liberia, Sierra Leone, Guinea		Electricity
Ethiopia and Kenya power systems Interconnection		Burundi, Kenya, Rwanda , Tanzania, Uganda	To promote power trade and regional integration	Electricity
Inga Hydropower				
North-South Corridor		Botswana, Malawi, Zambia, Zimbabwe, South eastern DRC, Mozambique, Tanzania, South Africa	To improve state of physical transport infrastructure	
Isaka-Kigali Railway		Tanzania, Burundi, Rwanda		Railways
Jordan railway project		Jordan, Syria, Saudi Arabia, Iraq	to foster improved regional cooperation	Railways
Turkmenistan-Afghanistan-Pakistan and India (TAPI) Natural Gas pipeline			To provide the countries with a secure long term supply of clean energy and deepen regional economic integration	Energy