



Notes on Infrastructure and Integration in South America

Summary of the Teaching Materials used in the Training Workshops “Integration and Development of South American Regional Infrastructure” – 2008-2009



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The opinions expressed herein are those of the authors and do not necessarily reflect the views of the CCT institutions of IIRSA.

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INTRODUCTION

These *Notes* constitute a summary of the main teaching materials used in the Training Workshops “Integration and Development of South American Regional Infrastructure,” organized by the institutions that form part of the Technical Coordination Committee of the Initiative for the Integration of Regional Infrastructure in South America (IIRSA)¹ in 2008 and 2009.² These activities were targeted for the technical staff of the Ministries and governmental agencies concerned with the infrastructure for the integration of the countries included in the Initiative. Even though the general purpose of the workshops was to enhance the technical expertise of the teams that cooperate with IIRSA’s National Coordinations, they also contributed to the institutional strengthening of such groups and their space for dialogue, thus reinforcing the regional cooperation process. It should be noted that these workshops were an opportunity to cut across interdisciplinary barriers, since they brought together experts from different fields, with different approaches to the same reality, but with a shared concern for the analysis and resolution of the problems inherent in investments in regional integration infrastructure.

The publication of this document seeks to offer a summarized record of such workshops. The material is deemed valuable not only for their actual participants, but also for a broader public interested in South American integration issues. This document forms part of a wider set of technical contributions that IIRSA has made with a view to improving planning activities related to integration infrastructure in the region.³

It should be made clear, however, that these notes do not purport to be a thorough analysis of each one of the complex issues discussed; in fact, given its wide and varied scope, such a work would need to be approached in a way that far exceeds the purpose of this document and the workshops’ agendas. Rather, these texts are substantially based on the presentations made by experts in the two editions of this activity, although other IIRSA documents and general literature on the issues addressed have also been reviewed.

Those responsible for this publication expect this material will help readers gain an overview of these topics and serve as an introduction to some of its key components. This document, given its origin, will not certainly cover all the aspects related to the physical integration of South America as an academic handbook would, although the broad and heterogeneous range of topics included is worthy of note.

¹ The Initiative for the Integration of Regional Infrastructure in South America (IIRSA) was adopted at a Meeting of South American Presidents held in the city of Brasilia, Brazil, in August 2000, at which the leaders of the region agreed to carry out joint actions to boost the political, social and economic integration process of South America, including the streamlining of regional infrastructure and the adoption of specific actions to promote integration and development of isolated subregions. The Technical Coordination Committee (CCT) is made up of the IDB, CAF and FONPLATA, and the Secretariat is exercised by the IDB-INTAL. See <http://www.iirsa.org>

² The programs of both workshops are included in an Annex at the end of this document. The proposal to carry out these training activities was put forth during the X and XI meetings of National Coordinators in July and November 2007. The first edition of the Workshop, held in October 2008, was organized together with ECLAC at its headquarters in Santiago de Chile; the second edition took place at INTAL’s headquarters in Buenos Aires in September 2009.

³ See <http://www.iirsa.org>.

This document is organized around three topical sections:

- Integration and infrastructure: An introduction;
- Sectoral diagnoses of integration infrastructure in South America;
- Contributions by IIRSA to territorial planning.

The first section deals with the importance of the integration process, its peculiar characteristics in South America, and the role played by infrastructure in this process. An analysis is made of the impact that infrastructure investments have on productivity, competitiveness and territorial development. Issues related to the provision of integration infrastructure and market failures are then explored. Finally, attention is drawn to some institutional and regulatory aspects related to the way the private sector participates in the provision and financing of infrastructure.

The second section provides elements for the diagnosis of the condition of integration infrastructure in different sectors of South America, namely air and railway transport, border and energy integration, precisely the sectoral analyses made in the different editions of the workshop. Such information does not intend, of course, to be a detailed record of the status of all the infrastructure in the region or to bear a close and strict relationship with IIRSA's fields of action.

The third bloc presents IIRSA's general goals and fields of action as well as the different conceptual and methodological tools developed within the framework of the Initiative throughout these years, such as the methodologies for territorial planning, the environmental and social strategic assessment, the analysis of logistics services and production chains in specific regions, and the assessment of transnational projects.

Both training workshops were closed with debates on the major problems related to integration and physical infrastructure development, which due to their nature are not included in these notes, which are of a more didactic character.

At the end of the document there is a non-exhaustive list of suggested readings with bibliographical references that are deemed valuable in order to get deeper into the topics approached, and the programs of the two editions of the training workshop are also included.

I. INTEGRATION AND INFRASTRUCTURE: AN INTRODUCTION

A. Integration: Introductory Notions. Integration in South America and its Differences with the European Experience. The Role of Integration Infrastructure⁴

Notions on Integration

The term *integration* encompasses several dimensions and has different meanings. One of its meanings focuses on the notion of *economic* integration as a process that links or combines originally separate national economies within a greater community or structure, which tends to enhance investment and trade flows; this dynamics is usually driven by or supported with legal and institutional actions taken by the States concerned. In this regard, all the economies for which their reciprocal exchange and investment flows are relevant to one another may be considered somehow *integrated*.

Nevertheless, *integration phenomena* is understood by the specialized literature, particularly after World War II, as processes displaying a strong component of actions coordinated by a limited group of States usually located in a well-defined geographical region that are intended to *strengthen* their economic and political bonds. The leading case is the progressive formation of the European Union, although we may also mention some early experiences in Latin America. From the *political* point of view, integration refers to a stronger combination of domains of authority that were originally independent from one another to form an entity having broader representation and domain.

As far as economic integration is concerned, its general purpose is normally considered to be the gaining of efficiency in resource allocation in a given geographical area, i.e. a region. Regional economic integration is attained either by eliminating, in different degrees, restrictions to and discriminations against the movement of goods, services, and production factors (the so-called *negative integration*), or by modifying the existing instruments and institutions to encourage improvements in terms of efficiency and achieve other objectives within the integrated space (*positive integration*). There is a long-standing theoretical debate about the advantages and disadvantages of economic integration in a given geographical area, i.e. about “regionalism.” Decisive conclusions regarding its advantages (net gains of integration) can be drawn only under very restrictive assumptions (conditions of perfect competition), whereas under other assumptions such conclusions become only hypothetical. The most recent experiences in Latin America and the Caribbean have shown that some disadvantages of regional integration easily foreseeable in theory are irrelevant in practice.⁵

In fact, theoretical approaches are not much able to account for the dynamic effects of the creation or strengthening of trade flows as a result of the integration of economies. Among such effects, we can mention the possibility of tapping scale economies and the gains in efficiency due to production specialization and complementarity. In particular, market expansion turns fixed

⁴ This subsection is based on the presentation by Mr. Roberto Bouzas in the 2008 and 2009 editions of the Training Workshop, and includes contributions by Carciofi [2008b].

⁵ See IDB [2002], pp. 44-49.

capital investments viable and makes it profitable to allocate resources to science and technology that may create positive innovation flows, with the ensuing increase in productivity and competitiveness. Integrated regional markets are learning experiences that strengthen competitiveness at the global level. The increased welfare derived from integration processes is evident enough, as proved by several historical experiences, even though such experiences may not be easily replicated at the institutional level. The *classical* pattern of development of economic integration, as explained in textbooks, points to a sequence of stages including the *free trade zone*, the *customs union*, the *common market*, and the *economic union*.

On the political arena, integration encompasses diverse objectives and different theoretical perspectives, among which we can mention a *pessimistic bias towards integration*, associated with a realistic approach seeking to maximize the security of the State, which is intrinsically restricted by the existence of other States, in contrast with the liberal visions (federalism, functionalism, transactionalism), which have different motivations to account for integration processes.

In order to attain political integration, the instrument used is to merge, to varying degrees, independent domains of representation and authority (*positive integration*), which in turn will be subject to different degrees of centralization of power, depending on the case. In political integration processes, the institutions to be created will include a series of bodies entrusted with executive, legislative, and administrative or dispute settlement tasks.

Structural and Historical Determinants of Economic Integration Processes: Views of the South American Case

Should we adopt a position influenced by the European Union integration process, we would surely hold a pessimistic view of the achievements and possibilities of integration processes in South America. The reason for this is, basically, that the process in our region differs from the sequence followed by the European case, where free trade among partners was followed by a customs union, and integration was further accomplished with the free movement of factors until a common market was born; furthermore, such changes in the economic structure were accompanied, in some cases early enough, by some other changes in the same direction at the institutional, political, social and even cultural levels. The sequence described was crowned with the creation of the new *economic and political community*, turned into a key global player.

It is easy to realize, however, that this pessimistic view is often biased toward oversimplification, since the stylization proposed refers to the European post-Treaty of Rome (1957) history, dating back a little more than five decades ago.⁶ Looking further back, a much more complex process can be identified. Thus, even though in the early 19th century Europe witnessed the beginnings of an integration process at the hands of trade, investment and institutional building —its peak being in the 1909-1913 period, when intra-regional trade accounted for 63% of the exchange among the countries— there were also strong centrifugal forces marked by economic nationalisms, which later on reflected in the wars of immeasurable destructive consequences. Only in the geopolitical

⁶ See Carciofi [2008b].

context of the 1950s and after a very painful historical experience could the European integration find a seemingly conclusive dynamics. It should be added that the integration process in the European case cannot be easily separated from a strong and complex industrialization process, facilitated by a huge accumulation of technical expertise and the strong financial development of its major economies. Equally important is the fact that as early as the last quarter of the 19th century intergovernmental cooperation efforts contributed to the physical interconnection of the European economies as a result of communications and railway transport agreements. Integration was also encouraged by market proximity, the availability of natural communication channels, and the near absence of significant geographical barriers; in other words, the integration process was met with important positive conditioning factors of a structural nature.

On the other hand, the historical and structural specificities of South America have not univocally encouraged integration processes between geographically close countries. The relative wealth of its natural resources endowments plus its relatively underdeveloped financial system and limited scientific and technological capacities account for the fact that the region has been historically integrated *outwardly*, i.e. the international market has had a stronger relative weight than the regional market; in fact, domestic markets have been almost irrelevant in determining the dynamics of national economies. What we can call the *pressure of comparative advantages* has traditionally resulted in low interdependence among the countries of the region, a factor that was reinforced by the geographical barriers for the creation of a regional market. Furthermore, an economic structure specialized in the provision of commodities is usually not labor-intensive and tends to give rise to a regressive income distribution, two factors that weaken domestic markets. All these elements account for weaknesses in what we may call the “spontaneous demand” for integration in the region, in strong contrast with the determinants described for the European case.

However, attention should be paid to the fact that the mere scale of the regional market is a factor that somehow neutralizes the trends towards exclusive specialization in commodity production in South America, if viewed as an integrated region. The size of its population and its progressive income growth open up the path to an increasingly complex economic structure, in which the strengthening of the countries’ interdependence acquires, from a dynamic perspective, economic relevance and meaning. In order to weigh such divergent positions today, it is important to note that if the South American trade growth were measured at constant prices in the 2003-2006 period, intra-regional trade grew at higher rates than extra-regional trade in all cases, except in Paraguay.⁷ If we similarly measure the Argentine and Brazilian exports to the MERCOSUR in the period between 1998 and 2008, both rose by almost 58% throughout the decade. Although extra-MERCOSUR exports from both countries grew much more (1.9 times), it should be taken into account that at different moments during that period both economies underwent strong economic crises that affected their own domestic markets, while commodity markets experienced exceptional upswings.⁸

It is worthy to emphasize that regional trade growth has taken place in a context of *open regionalism*, as a result of which South America has expanded its regional market and, at the same time and with different strategies, has consolidated its integration into various extra-regional

⁷ See Carciofi and Gayá [2007].

⁸ See IDB-INTAL [2009].

markets. In fact, in this market expansion process, its regional and extra-regional markets appear to be complementary to each other or, at least, not antagonistic. At any rate, all elements mentioned lead us to stress the peculiarities of each integration experience and take note of the long maturing process involved in each one of them. In sum, we can state that, despite the different political processes affecting the region, there are reasons that account for a “demand” for integration.

In light of the structural difficulties encountered by the South American integration process, the great number of problems faced by the different attempts at creating customs unions should not cause any surprise. In order to further explore this topic, the supply of and demand for regional institutions can be considered. This process is reflected in three qualitative indicators:

- i) Strength and nature of the interdependence relationships among the countries involved in customs union creation processes

Due to the considerations above, it is natural that the interdependence among countries should be relatively low and, in some cases, as in the MERCOSUR, extremely asymmetric. It is clear that the trade flows among these countries are relatively small vis-à-vis their total foreign trade, largely due to the structural characteristics of the countries involved. This, however, does not mean that this regional trade has not undergone a substantial growth in the last years. But there is no doubt that this weak “demand for coordination” derives from the relative weakness (if you will forgive the repetition) of such trade flows among the countries, which discourages them from relinquishing autonomy or discretion in the use of policy instruments.

- ii) Degree of convergence between national and economic integration objectives

Differences in the economic size and structure of the members of any customs union will normally entail differences in economic and trade interests, which will negatively affect any incentive to establish a stable relation of cooperation. In the MERCOSUR case, there have been no guarantees as to any stability in the countries’ access to a larger market, nor has it yet been possible to impose order on the policies that distort the *rules of the game* (for instance, the investment promotion regimes), nor has there been any significant progress in non-traditional trade issues. On several occasions, elements from the macroeconomic situation (for example, exchange rate depreciations) have fueled positions contrary to the expansion of intra-regional trade flows. In the case of the Andean Community of Nations (CAN), unlike the MERCOSUR, attention has always been paid to meeting the specific needs of the relatively less developed economies, and the progress attained in “non-traditional” fields has been a little more substantive.

- iii) Capacity for and effectiveness in providing leadership by one or more members

The effective exercise of a hegemonic or leadership role in any integration process calls for two conditions: (a) the existence of an agent determined to provide such “leadership” (a political result); (b) the capacity of such agent to do so (a question of resources). Due to different circumstances, both the MERCOSUR and CAN have found it difficult to build effective leadership. This has also weakened integration processes.

Brief Reflections on the Role of Physical Integration

In the analysis of economic and political integration initiatives in South America it is important to include integration infrastructure. The characteristic element of infrastructure is that it serves as a means of transportation for goods, services, people and information. Allocating resources to have a better physical connectivity implies, then, reducing transportation costs, thus enabling countries and regions to be better connected. In fact, deficiencies in this field are relevant structural conditioning factors that prevent any regional market from growing naturally or spontaneously.

As already stated, according to a traditional approach to these topics, the paradigmatic model of integration is the European Union. Within this framework, integration infrastructure is incorporated into the agenda as a mechanism for cohesion in a process driven by autonomous market forces. The expansion of transport networks in Europe since the 19th century was a condition as much as a stimulus for market expansion.

In this regard, it is necessary to highlight to what extent the South American starting point in terms of physical integration was different; this is due to the reasons already described, which are related to the different trade and international production integration patterns of both regions, as well as to the geographical features of their territories. Clearly enough, this aspect entails greater difficulties (and consequently, higher costs) for South America, which is characterized by vast land extensions and important natural barriers. Even though further development of physical integration may not immediately result in greater regional trade or balance, physical integration might possibly contribute to reducing territorial fragmentation and strengthening interdependence, thus increasing the “demand for integration.”

In particular, physical connectivity between neighboring countries in the case of South America facilitates a better use of the territory and, together with other ingredients, contributes to local and regional development. Infrastructure investment is, therefore, a dynamic factor with long-term consequences for the strengthening of regional bonds. Likewise, a greater and better development of physical integration may require the merging of some domains of authority and also create some spillover effects on other policy domains.

B. Infrastructure and its Effects on Productivity, Competitiveness and Territorial Development⁹

Economic activity tends to concentrate in production and urban centers, giving rise to territorial inequalities. This relates to different geographical attributes as much as to the interaction of agglomeration/clustering (centripetal) and dispersion (centrifugal) forces.

Economic agglomeration forces occur in the proximity of the sea, navigable waterways, and ports, and wherever there are (internal or external) scale economies that appear as a result of production linkages, or other non-pecuniary economies associated with “knowledge spillovers.”

⁹ This subsection is based on the presentations by Mr. Patricio Rozas and Mr. Ricardo Sánchez in the 2008 edition of the Workshop, and includes contributions by Carciofi [2008c], Rozas and Sánchez [2004], and Calderón and Servén [2003].

In turn, dispersion forces involve the following: *i*) the location of demand (and how this can compensate agglomeration tendencies); *ii*) a higher cost of land due to the concentration of the economic activity (which encourages movement to places where the land is cheaper); *iii*) a similar trend in the labor factor if its mobility is not perfect (which fosters the movement of production activities to areas with less expensive labor costs); *iv*) the emergence of negative externalities as a result of traffic congestion and pollution in urban/production centers.¹⁰

Depending on geographical features, transportation costs —as they impact on the time and cost of exchanges between different geographical points— will be determinant for the intervention of agglomeration and dispersion forces. For this reason, improvements in infrastructure, if they really contribute to reducing the time and cost of connectivity, reduce the *economic gap or distance* between locations, and geography is thus “challenged.”

Thus, the decision as to where to invest in infrastructure has relevant effects, since it will benefit some locations to the detriment of others, by influencing migration patterns, the establishment of new businesses and the location of other capital investments, thus contributing to enhance agglomeration in specific areas and/or possibly a wider dispersion of the economic activity.¹¹

With regard to the relationship between infrastructure and the integration process of countries, it becomes evident that only part of such infrastructure is of a regional nature —i.e. the part that supports trade flows among the countries of the bloc. Other infrastructure components support only domestic trade flows (within the same country) or external trade flows (linking the country with the rest of the world, outside the integration bloc).

The efficient provision of infrastructure services is one of the most important aspects of development policies. The lack of adequate infrastructure and the inefficient provision of infrastructure services are primary obstacles to the effective implementation of development policies and to attaining economic growth rates above the international average. For example, Calderón and Servén [2003] hold the view that up to a third of the difference in terms of growth between South America and Asia can be accounted for by “the slowdown in infrastructure investments” that took place in the 1980s and 1990s.

Improvements in infrastructure would offer greater production learning and knowledge spillover opportunities, contributing to increasing the rate of innovation and technological progress of the economy. In fact, investments in infrastructure create externalities in production and the aggregate investment level of the economy, thus accelerating long-term growth.

Moreover, improved infrastructure also has an indirect impact on the productivity of all the other inputs of the production process and firms. Regarding production factors, land, labor and physical capital increase their own productivity with infrastructure investments since these facilitate the

¹⁰ See Bereciartúa [2005].

¹¹ In particular it should be taken into account that reduced transportation costs will have an ambiguous effect on the location of the production activity, since the cost of the movement of goods and services will be lower for companies located in central or peripheral areas. Therefore, the effect that will prevail cannot be anticipated. For a review, see Puga [2002].

transportation of intermediate goods and inputs or the provision of services, provided this is done efficiently. Likewise, there is empirical evidence of a greater marginal productivity of infrastructure vis-à-vis other capital investments other than infrastructure. In addition, infrastructure facilitates a better handling of inventories, gaining access to new markets and tapping scale economies; infrastructure as a final product contributes directly to the Gross Domestic Product (GDP) as a component of the aggregate demand.

As explained in Mesquita Moreira [2008], in a world economy where there are large scale economies, the union of countries creates larger internal markets for the companies, which causes their production to increase by reducing average costs and accelerating production learning processes. Moreover, such unions create the conditions for the development of a broader network of suppliers, increasing their specialization and productivity and reducing costs. However, this would not be significant if the flows of goods and services were slowed down by high trade costs inherent in tariff and non-tariff barriers and poor infrastructure. A conclusion that might be drawn, then, is that any attempts at achieving economic integration and liberalization are doomed to failure wherever there are inefficient integration infrastructure services, since higher trade costs offset the benefits associated with larger scale economies.

In the last years, tariff and non-tariff barriers in Latin America have no longer been the most important obstacles to trade. Issues concerning trade facilitation, especially transportation costs, have gained relevance.

In particular, transportation costs have gained an unprecedented strategic importance in the region due to three reasons, namely: *(i)* successful trade reforms in terms of reduced tariffs and improved access to other markets; *(ii)* increasing fragmentation in production and time costs in commercial transactions; and *(iii)* the emergence of economies such as China and India, with a great supply of labor and demand for natural resources, which has encouraged the region to concentrate in transport-intensive goods.

A research work conducted by the IDB, which has collected information on the region since 1990, accounts for the following:¹²

- Transportation costs are significantly higher than tariffs. For instance, the average transportation cost of regional exports to United States is 7.8%, whereas the average tariff is 2.7%. In the case of intra-regional exports, transportation costs amount to 4.3%, while tariffs amount to 1.9%. Throughout these years, freight costs have prevailed over tariffs. If we include time costs, i.e. the capital cost of storing stocks or the measures adopted to avoid the depreciation of goods, the gap is even wider.
- Transportation costs in the region are higher than those in developed countries. For example, the Latin American average sea freight to the United States is 75% higher than that from the Netherlands. This is mostly because of the share of “heavy” goods, port and airport deficiencies, and a weak competition in transportation services.
- Reductions in transportation costs may have a significantly higher impact than tariff liberalization, in terms of both trade volume and diversification.

¹² See Mesquita Moreira *et al.* [2008].

Improvements in the provision of infrastructure services help economic agents manage their costs in a more efficient way. In the case of firms, their competitiveness is enhanced due to cost reductions, since investments in infrastructure turn supply, storage and distribution chains more efficient. Consequently, the relative prices of local production can be expected to decrease, while productivity can be expected to increase. Hence, more opportunities will be created to increase imports and exports, just as when external tariffs are lowered.

Another positive effect derived from an adequate availability of infrastructure and an efficient provision of related services is the gains in specialization that a country can obtain due to the segmentation of the production process, in line with the new parameters of economic organization internationally spread by globalization. In most cases, the participation of local firms in international production or marketing systems can lead to both scale economies and agglomeration, resulting in more efficient production factors. This would not be possible unless an adequate integration infrastructure, including logistics systems and platforms, were available.

In addition to the advantages of specialization, infrastructure promotes the creation of *network* externalities, which take place when the value of a product or system paid by a user rises as the number of users increases. *Network* industries, which include telecommunications, information technology, electricity and transport, may create important scale economies and promote substantial technological innovation. Such network externalities may take place either directly or indirectly, depending on whether they arise in a given business sector or in complementary business sectors.

Such externalities are present in the infrastructure of developing countries. In particular, there is empirical evidence showing that, once a minimum network level is reached, the marginal productivity of infrastructure investments is higher than that of other investments. Thus, adequate integration infrastructure enables each country to benefit from improvements in infrastructure in the context of a regional chain of supply. Therefore, all the participants are in a “win-win” situation.¹³

Thus, progress in infrastructure constitutes a key element for territorial integration and the economic system, making transactions possible within the country or region, and with other countries. This is because it brings forth the reduction of transportation costs, improves access to the market of goods and inputs, and increases the coverage and quality of the services provided to the population (such as health, justice and education). Thus, the development of infrastructure contributes to the economic articulation of a country by facilitating trade flows. Furthermore, it acts as a backbone underpinning the territory, and this is the reason why undoubtedly there is a very strong relationship between infrastructure and the socio-political development of a country or region.

A final word on this topic is that the development of physical infrastructure is not a sufficient condition to face the challenges of a greater integration. However, we may conclude that physical integration would contribute to reducing territorial fragmentation and strengthening

¹³ See ADB [2009].

interdependence, thus increasing the “demand for integration.” Infrastructure investment is, then, a dynamic factor with long-term consequences for the strengthening of regional links.

C. Integration Infrastructure Provision and Market Failures¹⁴

In general, infrastructure investment projects take place within a framework of *market failures*, among which we can mention the presence of scale economies, externalities, and public goods. These elements explain why there is a need for public intervention by either providing or regulating the goods or services involved.

Scale economies refer to a technological characteristic of various production activities whereby as production (or service provision) increases, the unit cost decreases, encouraging concentration in few production units.

The extreme case of scale economies is the one known as the *natural monopoly*, i.e. a peculiar situation in which the best option is to have one rather than many suppliers, since production costs are lower than in the case of more suppliers offering the same good or service in a given market. This is generally the case of infrastructure, particularly of integration projects. A solution frequently used in Latin America has been the public provision of the good concerned.

Another market failure, on account of which price mechanisms do not reflect the true social benefit or damage of a good, is the presence of *externalities* —i.e. the effects derived from an activity that unintentionally creates benefits or costs for other economic agents; these are also called “spillover effects.” There are positive externalities, for example, when primary education is provided and society as a whole reaps from it, regardless of who receives basic knowledge; something similar can be said of vaccination campaigns against highly transmissible diseases. When externalities are positive, public policies should encourage consumption by subsidizing the activity concerned, since the number of users or consumers would otherwise be lesser than socially desirable.

Negative externalities take place when an activity causes damage to others and the market does not reflect such cost or damage. Thus, the private supply of goods and services with negative externalities is higher than socially desirable, for which reason their provision should be constrained by increasing their cost, for example, with taxes that seek to counteract the damage caused.

An infrastructure project can clearly have positive or negative effects outside its direct area of influence, i.e. it may generate externalities. If a road is constructed and subsequently an entire exporting area of a country develops, such country-wide benefit is not necessarily computed in the individual project. When infrastructure is built in a border area, for example, externalities may be created in the border regions of the neighboring State, and the other country may take

¹⁴ This subsection is based on the presentation by Mr. Ricardo Carciofi in the 2008 edition of the Workshop, and includes contributions by Beato [2008].

advantage of them passively or may decide to enhance such effects by making complementary investments in its own territory.

A good example of a negative externality is the environmental issue. In fact, a major reason why the construction of integration infrastructure projects is often obstructed is precisely the environmental issue. Countries involved in a given infrastructure project tend to overestimate its damages and demand for compensations. As this does not take place within the framework of the project itself, there may follow a rather complex discussion about how such compensations should be established.

On many occasions, infrastructure falls under the category of a public good —i.e. the kind of good that may be classified as an extreme example of positive externalities. Potential consumers of these goods are impossible or hard to exclude: in a market system, producers try to identify the consumer so that he/she should pay for the good or service in question. But there are other situations in which it is impossible to exclude those who do not pay —this is known as a non-rivalrous situation, because the consumption of the good by one individual does not reduce the availability of the good for consumption by others. National defense is a typical example: a country will defend its borders and population regardless of whether its inhabitants agree or not with such protection and of whether they pay for it or not.

As far as infrastructure is concerned, a standard example is the construction of a lighthouse. Here, ships not sailing under the flag of the investors cannot be excluded from using the lighthouse services. Given this feature, private economic agents would not invest in this sector, since they would not be able, in principle, to charge for the service despite its social utility.

Another traditional characteristic of a public good is that providing such good to an additional citizen is not more expensive, i.e. the cost of extending the service to another person tends to be zero, which is the same as saying that its *marginal cost* is null. Again, the lighthouse is a good example: the cost is the same for serving one, two or more vessels, to the point of congestion of the route.

Depending on the geographical radius of influence, there are different types of public goods: local, national and regional. All of them have some degree of decentralization and functions delegated to the different governmental levels.

When no one can be excluded from consumption and providing the service to more users is not more expensive, then provision and financing need to be in the hands of the State through the tax system. Citizens do not have the right to demand consideration for taxes; thus, the issue to solve is how to apply taxes to citizens without giving rise to a *tax rebellion* when the expenses financed by them do not meet the demands of all but of some. Public expenditure does not only entail the transfer of income between people but also between regions. In particular, in the case of infrastructure works, which by definition have a territorial impact and are executed through public expenditure, those who will not benefit from such works may protest against them.

Some Distinct Features of Integration Infrastructure Projects

As already analyzed, infrastructure projects have the potential to create spillover effects (*externalities*) beyond the political and administrative borders of the regions and countries where investments are made. This means that there may appear positive or negative effects outside the area of the project.

Depending on the party responsible for the project investment and on the way its benefits and costs are distributed, three situations may take place: *i*) the investment is concentrated in a country and the net benefits are distributed; *ii*) net investment and benefits are proportionally distributed between two or more countries; *iii*) net investment and benefits are asymmetrically distributed between two or more countries; *iv*) projects are indivisible.¹⁵

Externalities make it even more difficult to correctly identify net benefits, since the countries involved in a given infrastructure project will tend to overestimate the damages or minimize their own benefits, and vice versa. This will lead to a dilemma as to how to establish compensations according to the net benefits received by the countries concerned.

Physical integration projects involve the usual *risks* associated with the provision of infrastructure, which add up to an array of risks specific to or inherent in integration processes. Given the magnitude of the projects and their transnational dimension, projects of this kind encounter difficulties that pose greater risks than national infrastructure projects.

As analyzed in the next subsection, the usual risks may be classified according to the cash flow components affected by a contingency or according to their origin. The risks inherent in transnational projects relate to the regulatory and legal framework as well as to coordination issues. These projects raise questions such as which legal and regulatory framework (i.e. from which country) will be applied, how disputes, if any, will be settled, and how the stability of the regulatory system applied will be ensured. Another relevant feature which is also a risk specific to these kinds of initiatives is that the development of transnational infrastructure projects requires sovereign parties to coordinate actions for their physical implementation, showing how important it is to attain regulatory convergence or harmonization.

Regional Public Goods and Integration

There are several factors that help understand different aspects of the provision of integration infrastructure as a regional public good and the importance of collective mechanisms to promote its provision. It has already been stated that infrastructure projects may have spillover effects beyond national borders. But when analyzing the provision of integration infrastructure, it is possible to verify that the level of the investments that countries make on an individual basis is far from optimum. This is due to a series of reasons, such as insufficient information among the countries concerned regarding project benefits, the lack of schemes for the distribution of costs

¹⁵ See Wulff [2009].

and benefits among the countries, and economic and political restrictions to bear the costs of infrastructure in another country.¹⁶

Box 1
A TYPOLOGY OF GOODS AND THEIR REGIONAL DIMENSION

In an article written in 1954, Paul Samuelson developed a useful typology to conceptually classify *goods*, understood as any kind of product, structure, process or condition, the consumption or use of which creates a *benefit* for the one who consumes or uses it. This classification may be summarized in a matrix (Table 1), where goods are categorized simultaneously according to two attributes that respond to one question each: first, how does the consumption of the good affect the existing stock of such good? Second, what is the cost of preventing or excluding from consumption those who do not pay for the good? Although both attributes may vary in a progressive gradation, we may think of extreme cases, as in the table below.

Table 1: Typology of goods

Goods	Excludable	Non-Excludable
Rivalrous	Private	Common-pool resources
Non-rivalrous	Impure public (Club goods)	Public

Thus, in response to the first attribute, the issue to consider is to what extent a *rivalry* or competition among consumers is created. On one extreme there are goods the consumption of which by one individual involves the immediate reduction of their stock or their quality, thus limiting the number of consumers or users; on the other extreme, there are goods the use of which is not a direct detriment to their consumption by other users. Conventionally, the former are known as “rivalrous goods” and the latter, as “non-rivalrous goods.”

With regard to the second attribute, the classification takes into account how expensive it is to *exclude* consumers who do not pay for the good or, from another perspective, how expensive it is to assert property rights over such good. This marks the difference between “excludable goods” and “non-excludable goods.” The table above includes the four extremes possible. Thus, a rivalrous good with a negligible exclusion cost is a typical *private good*: consumption of one kilogram of coffee by an individual prevents another person from consuming such stock, while the owner of the good can assert his/her property rights without incurring extraordinary costs. On the contrary, a shoal of fish in an area of the Pacific ocean is also a rivalrous good, since fishing by some fishermen will be to the detriment of the stock available for others, but the clear assertion of property rights over such resource is very likely to involve maritime surveillance costs much higher than the fish yield; this is, then, a case of *common-pool resources* in the fisheries sector. *Pure public goods* are both non-rivalrous and non-excludable. For instance, in principle cleaning a lake will create benefits to all its users for a given period, and those who did not pay for such cleaning operations cannot be excluded from using the lake.

Finally, under the *impure public goods* category, there is a group of diverse goods in terms of their non-rivalry and non-exclusion degrees. When an individual enjoys the benefits of a natural park or a road, there is no immediate reduction of the probability for others to enjoy them, at least until the park or road becomes congested or saturated. In such cases, exclusion mechanisms can be created at a low cost that take into account (or “internalize”) such potential saturation effect; for instance, a fee can be established for each additional user. These partially rivalrous and excludable goods are known as *club goods*.

Pure public goods, on account of their features, give rise to what is known as a *collective action concern*, since, under normal conditions, their supply will not grow as a result of private action, although such growth would undoubtedly result in greater welfare. Clearly, difficulties in recovering public good production costs discourage the private sector from producing such goods. Therefore, their supply should be structured through some mechanism of collective action implemented, for example, by the government. The greater the possibilities for exclusion offered by club goods, the greater the chances for private financing, albeit this will depend on many other conditioning factors (such as the investment level involved), giving rise to a broad margin for an interplay of private action and public regulation to ensure an adequate and efficient provision of the good.

When introducing the *location* dimension of those who enjoy the benefits derived from the goods, public goods may be easily classified into *national* (an efficient judicial system), *global* (stable environmental conditions of the planet), or *regional* (a road connecting two countries). The beneficiaries of regional public goods are the residents of a region, regardless of how such region has been defined; for example, a region may be an entity created by an economic integration agreement (such as the CACM, CAN or MERCOSUR), or may be defined by geographical-economic elements (such as the “Plata basin” or the “South Pacific”). Regional public goods are non-rivalrous and non-excludable; they go beyond national borders but they do not amount to global goods. Evidently, the collective

¹⁶ See Beato [2008].

action problem that affects their production is enhanced in the case of regional goods, since they require cooperation and coordination instruments from the States involved. These instruments must define how to distribute among the countries concerned the costs and benefits resulting from the actions taken in order to increase the supply of public goods and, through them, enhance the social welfare of the region.

Source: Prepared by the authors based on Arce [2002], Estevadeordal *et al.* [2002], and Sandler [2002].

Integration infrastructure involves such high fixed costs that, frequently, countries cannot bear them by themselves, for which reason such costs should be distributed among the countries concerned, and project partners should agree on financing mechanisms. Different theoretical approaches show how *free rider* problems¹⁷ arise in asymmetrical information contexts, since a country may pretend to have lower investment capability than real, so the other countries end up bearing higher costs for the infrastructure investment. In addition, as already stated, countries may choose to benefit passively from the other parties' infrastructure, without paying for it, which is also a *free rider* attitude, because one country is bearing the cost of the infrastructure investment while the other country enjoys its benefits at no cost.

Furthermore, as explained in Beato [2008], the selection of integration infrastructure projects is made at two levels: in each country concerned and between their respective governments. In the first place, attention should be paid to the fact that the countries' populations are heterogeneous and have their own preferences or views regarding integration projects, which are then aggregated by the different countries in a distinctive way based on their own political processes; therefore, the choices of the countries involved will not be homogeneous either. In the second place, in addition to their different interests, governments will also design different negotiation strategies, whereby they may or may not reveal their preferences, thus conditioning the result of such negotiations and hence the selection and financing of investment projects.

All this helps us understand that integration projects require *coordination actions* at different levels, such as the distribution of the costs and benefits of projects, the forms of financing them, the rules governing project management and exploitation, the possible participation of private capital, mitigation of environmental impacts, etc.¹⁸ This justifies, then, the existence of a coordinating structure concerned with integration infrastructure projects in order to help solve the issues above mentioned, and encourage investment in this kind of infrastructure.

¹⁷ A free rider is an individual who wishes to benefit from a public good but is not willing to pay for it. In a collective context, free riders are economic agents who benefit from other parties' actions, shouldering no share of the cost of such actions. In particular, in integration infrastructure investment projects, a free rider is the one who cannot be excluded from the benefits derived from a project, but does not pay anything for them or pays less than a fair share of the costs of their production.

¹⁸ See Carciofi [2008a].

D. Ownership and Management Modes in Infrastructure Provision. The Role of the Private Sector¹⁹

With regard to infrastructure service provision, a distinction may be drawn between the *ownership* and *management* dimensions. Based on this, we may consider configurations between the public and private sectors regarding ownership and management.

1) Public ownership and public management

The most traditional situation falls in this category. The public sector hires different companies for the different project stages (design, construction, maintenance, etc.), and these stages can even be carried out by the State.

2) Private ownership and private management

This means the privatization of public infrastructure networks.

3) Public ownership and private management

In these cases, the private sector assumes the responsibility for most aspects of an infrastructure project. Several contract forms that include the different schemes for Public-Private Partnership (PPP) may be distinguished. Each form proposes different mechanisms as to project financing, responsibility for the global operation of service provision, responsibility for project design, and remuneration of the private partner.

The form of participation of the private partner will often depend on the production sector involved. In sectors such as communications, privatization processes (mode 2) together with competition promotion systems have been very common. Instead, in other sectors, such as ports, roads, airports, water and sanitation, the private sector has been actively engaged in the construction and operation of infrastructure. The latter comprises different PPP forms, the salient features of which are described below.

Public-Private Partnerships (PPPs): Major Characteristics

A broad definition of PPP schemes was proposed in CAF [2004]. There, PPPs are defined as “cooperation agreements between public and private entities according to which, through different techniques, modalities, scopes and timeframes, the private sector is commissioned with the design, construction, enlargement, maintenance, repair, management and/or financing of public infrastructure and/or services of public interest (in a broad sense),” transferring to it part of the risks and responsibilities, while the State invariably retains the power of control and regulation of the activities of private partners.

¹⁹ This subsection is based on the presentation by Mr. José Barbero in the 2009 edition of the Workshop and on the presentation by Mr. Patricio Rozas in the 2008 edition of the Workshop, and includes contributions from CAF [2004] and CAF [2009].

The most generic feature of PPPs is that the private sector makes the investment and manages or operates infrastructure services traditionally provided by the public sector. The most important features in any PPP scheme are the following: (i) the responsibility for the risks is assumed by both the public and private sectors, as established in a long-term contract; (ii) assets remain under the control of the private company for a specified term; (iii) the investment in and the operation/management of the infrastructure are commissioned to the same private company.

The purpose for the public sector to enter into a PPP is to distribute risks in order to reduce costs in addition to raising funds so as to finance the project. Incorporating expertise in long-term management is also sought. In turn, private partners' revenues may come from the users and/or public funds.

A series of potential advantages of PPP schemes may be pointed out. First, investment projects can be thus financed, enabling the State to allocate public funds to other purposes. Another argument in support of PPPs relates to the supposedly greater efficiency of the private sector (better expertise, specific knowledge, and scale) and to the avoidance of public management problems (associated with poor innovation and low quality of service). This is evidently a controversial issue, since the incentive for a private company is cost reduction, but not necessarily maximizing social welfare. PPPs may also work out as a good option for maintenance works, since public funds and management capacities tend to be insufficient. Whenever construction and maintenance are included in a PPP scheme, the private company assumes the risks of maintenance costs, which creates incentives for an adequate conservation of the works undertaken. A final consideration is their potentially positive impact on local capital markets.

Yet, there are also some disadvantages that sometimes may prevent PPP schemes from becoming the best option for the construction of infrastructure and provision of related services. First, there may be strong information asymmetries between the private company and the State, affecting the possibility of specifying quantities and quality levels in the contracts signed (as well as the viability of their control), which in turn might create difficulties in controlling expenses and compliance of contract obligations, therefore impacting on the ability to lower incentives for the private sector to excessively reduce costs and investments.

The combination of information asymmetries and uncertainty in long-term ("incomplete") contracts produces several undesirable effects, such as difficulties in implementing network expansions or modifying service standards, and makes it difficult to organize proper risk management and transfer mechanisms. These aspects entail a potential fiscal risk, resulting from higher and unpredictable costs in the form of subsidies, guarantees and judicial resolutions in the event of disputes, and also promote a tendency to constantly renegotiate contracts, increasing uncertainty even more.

PPP schemes may also give rise to an excessive concentration of market power and, hence, to anti-competitive business practices.

The Question of Risk in PPPs

One of the keys for the success of PPPs is the allocation of the risks associated with infrastructure projects. These risks may be classified according to the cash flow components that are affected by a contingency, or according to their origin.

Cash flow-related risks include the following:

- Risks affecting initial investment, associated primarily with the construction process (for example, it is more costly or takes longer than estimated), but which may also involve risks related to expropriations, permits, licenses, and environmental authorizations;
- Risks associated with revenues, caused by potential variations in the demand for infrastructure, in the price of the services rendered, and in the companies' billing and collection capabilities;
- Risks associated with operating costs, caused by potential falls in the productivity of maintenance and management works, which may increase running costs;
- Risks associated with financial costs, basically caused by interest rate and exchange rate fluctuations.

Origin-related risks may be sorted out as follows:

- Market risks, which comprise those related to the business activity and may therefore include some of the previously mentioned risks;
- Political risks, caused by changes in the political context and/or legal framework of the project;
- Force majeure risks, caused by contingencies such as natural disasters.

The first step in any PPP scheme should be to try to reduce all possible risks associated with a project; therefore, planning is relevant to reduce overruns and delays. In allocating the risks of an infrastructure project under a PPP scheme, a reasonable criterion would be that private companies assume the construction and operation risks, while governments assume the political risks; however, such risk allocation is not easy to implement or revise with easily proven criteria.

In the case of the demand-driven risks that projects may face (which form part of revenue-related risks), different mechanisms can be used to try to mitigate them. Some of them are:

- Minimum revenue guarantees (MRGs) associated with the operation of the project: One of their advantages is that they help governments establish revenue curves for the bid; they also reduce the finance costs for private partners by increasing certainty in revenue flows;
- Economic rebalancing provisions: Usually ranges are established for relevant variables and adjustment mechanisms are activated when these metrics fall outside those ranges;
- A system of remuneration bands: This system seeks to define the level of expenses borne by the State when infrastructure services are paid by the State rather than by the users. With a band system, the payment of unpredictable obligations is avoided whenever the

service or traffic level is low and higher rates are paid, or vice versa if more services than estimated are provided;

- A system of flexible rates: During demand peaks (that involve higher social costs) rates can be increased.
- A least-present-value-of-revenue mechanism: The government proposes a discount rate and a rate system, and the project is awarded to the bidder who offers the least present value of revenue to be received over the lifetime of the project. The contract lasts until the bidder collects its desired revenue. Should the demand be lower than expected, the contract is extended, and the opposite holds if the demand is higher than expected. This bid scheme is suggested for projects where usual investments involving substantial amounts are not required, given the incentive to reduce investments that private partners may have.

Public-Private Partnership Scheme Models

Different classification criteria can be applied to PPP models. The most common ones are the following:

- a) According to the type of authority or rights transferred to the private sector: *(i)* collaborative PPPs; *(ii)* operational PPPs; *(iii)* contributory PPPs; *(iv)* advisory PPPs;
- b) According to the entity that assumes the responsibility for funding the project: *(i)* pure public funding, either within or outside the budget process (i.e. depending on whether the funding is recorded following accounting criteria for budget purposes); *(ii)* pure private funding; and *(iii)* public-private or shared funding.
- c) According to the source of the funds from which the private partner will be remunerated: *(i)* user fees; *(ii)* payments or contributions by the State; *(iii)* a combination of both.
- d) According to the type of management: *(i)* with direct management; *(ii)* with indirect management.
- e) According to the time frame of the contract: *(i)* short-term contracts; *(ii)* medium-term contracts; and *(iii)* long-term contracts.
- f) According to the PPP contract type, i.e. the kind of risk assumed by the private sector.

The main features of PPPs, according to the last classification above, i.e. by contract type, are described below.

i) Maintenance Contracts

Through this type of contracts, usually known as *service lease*, the public sector commissions the private agent to conduct the ordinary, regular maintenance and/or rehabilitation of an infrastructure work. Normally the contract period is 5 to 10 years. The private agent contributes part of the working and operating capital. Remuneration can vary, usually based on a percentage

of the rate applied to service provision, and payments tend to be established on the basis of objective parameters of performance (*performance-based maintenance contracts*).

ii) Management Contracts

Like the category above, these contracts may also be classified as *service lease contracts*. Contract periods are usually short (5 years) and they are restricted to specific tasks or activities (tolls, cargo control management, traffic maintenance and surveillance, traffic signal control system, traffic count, etc.). Private investment is not involved. The private agent is paid a fixed fee and there are pre-established costs and standards that must be fulfilled.

iii) Turnkey Contracts

Through this type of contract, the public sector commissions a private entity to build public works for a given price, payable directly to the contractor once the infrastructure is delivered upon completion. In essence, this modality derives from the traditional *public works contract*, but, unlike the latter, it has the following features:

- The project is financed by the private contractor, who will be paid once the project works have been completed.
- The tasks commissioned under a turnkey contract tend to be of a broader nature than those usually executed under a public works contract.

iv) BOT (Build-Operate-Transfer) / DBOT (Design-Build-Operate-Transfer) Contracts

Under this type, also known as a public works concession, private partners are requested to build new public facilities (*greenfield* projects), or to enlarge and/or maintain existing infrastructure, the control of which is retained by the private partners, in exchange of the right to operate the facilities for a fixed period to enable them recover their costs and realize a return on their investment, after which ownership reverts back to the concessionee (the State).

v) Concession Contracts

This category refers to “concessions of use,” which in the infrastructure sector are implemented through contracts. In general, there is some pre-existing infrastructure (for example, a road, port, airport, etc.) that the public sector transfers to the concessionaire for a specified period. The concessionaire undertakes enlargement or rehabilitation works (under a “Transfer-Build-Operate-Transfer” or TBOT arrangement), and at the end of the contract period ownership reverts back to the State.

vi) Joint Ventures

In this type of organizational arrangements, private contractors and the public administration create an ad hoc legal entity, of a public or public-private nature. This special purpose entity is given the responsibility for the design, building, maintenance, rehabilitation, enlargement, management and/or financing of a given infrastructure. Private participation is then channeled through one of the PPP forms previously mentioned.

Conditions and Other Considerations for Creating a Public-Private Partnership

In Barbero [2009], the European Union's "roadmap" for the implementation of a PPP is presented. Based on the experience involving the establishment of PPP schemes, a set of basic conditions is also identified to ensure the successful implementation of these arrangements of private management of public property.

In particular, such "roadmap" identifies a series of stages, namely:

- a) Preliminary study, concerned with the legal context and institutional capacity of the public sector, and involving the drafting of national and local legal regulations;
- b) Project identification, which involves planning processes and the analysis of project feasibility, including total service costs as well as the costs and benefits of the PPP;
- c) Project assessment, during which risk sharing, the PPP components and budget are analyzed; as a result, the most suitable PPP type can be chosen, and its structure defined;
- d) Design and institutional arrangements, leading to the concrete design of the PPP, and to the selection and design of the procurement mechanism;
- e) Procurement, involving several tasks inherent in procurement processes, related to its promotion, competition among potential bidders, evaluation of bids, negotiation of specific contract terms, and the contract proper;
- f) Implementation, concerned with the start-up of the infrastructure works involved, which includes building the facilities and operating the service, monitoring these activities as well as other contract management actions, and evaluating the results.

The basic conditions for a successful PPP implementation, which jointly contribute to enhancing confidence in order to attract bidders and reduce risks, are: *i)* macroeconomic stability, which has a direct impact on the possibilities of attracting bidders, since it reduces risk perception, facilitates financing, and promotes demand for services, which in turn impacts on the number and variety of bids submitted; *ii)* legal certainty, a dimension concerned with clear rules of the game, stable regulatory frameworks to prevent unilateral contract modifications, and effective dispute settlement mechanisms; *iii)* institutional strength, which has to do with the existence of political consensus and the availability of expertise to ensure adequate design, execution and monitoring processes, as well as with legitimacy and acceptance by society.

II. SECTORAL DIAGNOSES OF INTEGRATION INFRASTRUCTURE IN SOUTH AMERICA

A. 1. Transport Modes: Air Transport²⁰

To understand how this sector works, in this market there are three key stakeholders who are in constant tension: the public authority, with its power to set forth policies and regulations; the airports (either State-run or private), and the airlines (most of which are private).

Pursuant to their role and procedures, authorities should safeguard security and establish rules to promote an adequate supply at “reasonable” prices, facilitating the development of robust and sustainable airlines. But authorities are sometimes entangled with a national airline and adopt protectionist positions that raise costs and fares. The airports, which are sometimes very expensive for geographical or technological reasons, compete for revenues with the airlines, while airlines compete with one another to gain a larger market share. Consequently, some market segments are oversupplied, others are undersupplied, and still others are not served at all [Kogan, 2009].

South American air transport has some institutional peculiarities, such as the fact that the air space is usually under the control of the national Air Forces, or it is a Ministry of Tourism (rather than the Ministry of Transport) the one in charge of regulating the activity.

At the international level, States regulate air traffic mainly through bilateral agreements that set forth the rights that signatories mutually grant to each other. In South America there are forty bilateral agreements in force, although ten support no regular air transport service.

In bilateral agreements, the following items, among others, are defined:

- i) The airlines designated in a country to operate the routes connecting countries;
- ii) The routes that designated airlines can operate;
- iii) The capacity that each signatory party can offer, through its designated airlines, which may be quantified in number of flights, number of seats, size of aircrafts or a combination of all of these items;
- iv) The methods for fixing and regulating fares.

To standardize the criteria applied to these agreements, the International Civil Aviation Organization (ICAO) has defined the general framework governing the rights of its Contracting States, the so-called *Freedoms of the Air*.

Such freedoms were initially enunciated in the Chicago Convention (1944), which gave birth to the ICAO, where the first five freedoms were laid down. It is to be noted that the first two freedoms are known as the *Technical Freedoms* or *Non-Commercial Freedoms*, whereas all the

²⁰ This subsection is based on the presentations by Jorge Kogan in the 2008 and 2009 editions of the Workshop, and includes contributions by Ricover and Negre [2003].

others are *Commercial Freedoms*, because they entail a compensation for performing operations in a foreign State.

A relevant element in the consensus reached in the Chicago Convention was that all States agreed on mutually granting the *Technical Freedoms* to one another. The Third and Fourth Freedoms were left to the discretion of bilateral agreements entered into by the States.

These five basic rights have been followed by other three as a result of an increase in the so-called *hubs* or regional distribution centers, and of advances in aviation technology. The Fifth, Sixth and Seventh Freedoms result from multilateral agreements or from combinations of bilateral arrangements, whereas the Eighth Freedom (known also as *cabotage*) is granted by one State to another at the former's discretion; it is a rare freedom.

Finally, behind all these freedoms lies the concept of *flag-carrying airline*, i.e. there is an airline that represents a given State and provides regular flights. *Non-regular (charter) flights* are subject to another regulatory framework.

Freedoms of the Air

- Technical Freedoms -

First Freedom: The right to fly across the territory of another State without landing.

Second Freedom: The right to land in the territory of another State for non-traffic purposes.

- Commercial Freedoms -

Third Freedom: The right to put down, in the territory of another State, traffic (passengers, mail, or cargo) coming from the home State of the carrier.

Fourth Freedom: The right to take on, in the territory of another State, traffic (passengers, mail, or cargo) destined for the home State of the carrier.

Fifth Freedom: The right to put down and to take on, in the territory of another State, traffic (passengers, mail, or cargo) coming from or destined to a third State, when the flight originates or ends in the home State of the carrier. The third State or States must authorize this right.

Sixth Freedom: The right of a given State to exercise two Third and Fourth Freedom rights to transport, via the home State of the carrier, traffic moving between two other States. This means that country A, exercising its basic rights with country B, takes on passengers, mail and cargo from B to take them to A, where they are transferred to another flight destined to country C, with which country A also enjoys such basic rights. Thus, airlines of country A may have access to the market of passenger transport between countries B and C.

Seventh Freedom: The right of transporting traffic between the territory of two States other than the home State of the carrier without the service connecting to or being an extension of any service to/from the home State of the carrier.

Eighth Freedom: The right of a designated airline to transport cabotage traffic between two points in the territory of another State, i.e. to operate domestic flights in a country other than the home country of the carrier.

In addition, there are two *multilateral agreements* in South America. The Andean Community has adopted a common air transport liberalization system (Decision 297) in 1991 to ensure an open sky scheme, which however has not come true yet. This is because, regardless of trade liberalization, there are technical and operational regulations that result in discretionary decisions to receive flights.

At the MERCOSUR-plus level (i.e. its four full members plus Bolivia, Chile, and Peru, the latter associated in 2000), there is also a multilateral agreement in force: the Fortaleza Agreement, signed in Brazil in 1996. It is an open sky agreement for subregional routes not regulated by bilateral agreements. In fact, this agreement fosters airlines to operate less profitable routes.

Air Traffic and Integration

In general, a large number of air transport problems result from operations, particularly due to traffic in terminals and access gates. The increase in the air transport activity forces member States and air transport service providers to adjust to and meet the needs of the market.

Therefore, improvements in airport infrastructure may be curtailed by the lack of coordination among the entities responsible for the supervision, management and economic regulation of airports.

It is important to point out that in the last years there has been a remarkable transfer to the private sector of airport operations and management in many countries, in the context of a globalized operation by international companies.

Even though airports cannot evidently become integrated, there is ample room for regulatory harmonization, which would help the system gain in efficiency and security. The Latin American Civil Aviation Commission (LACAC) has undertaken harmonization efforts, especially in the air navigation field (communication systems, surveillance, data processing, radars, flight plans, airspace structure, routes, operational procedures, etc.), but there is a huge gap between these technical advances and their political implementation.

It is to be noted that, even though countries have exchanged more basic freedom rights among one another and have granted more rights to transport passengers to third countries within the region, the domestic flight supply fell by 18% vis-à-vis 2003. In other words, the liberalization of rights regarding services within the region is not a sufficient condition for stronger integration in terms of air traffic. The true engine for regional integration is subject to the liberalization of

rights involving routes to more important traffic generating centers, usually located outside the region.

Box 2
PROBLEMS FACED BY SOUTH AMERICAN COMPANIES IN THE ROUTES TO EXTRA-REGIONAL TRAFFIC CENTERS

In aviation bilateral agreements, rights have been liberalized exclusively within the region and not for destinations outside the region. Historically, designated airlines of South American countries have had little chances of capturing traffic from the northern countries of the continent en route to large traffic centers in North America and Europe. This tendency has not changed.

In turn, airlines from northern countries in the continent may capture traffic from the southern countries, take it to their countries and make it change flights to destinations outside the region, exercising the Sixth Freedom. South American countries have responded to this tendency by limiting basic rights to traffic between their own country and third countries within the region (known as the Third and Fourth Freedoms) in order to restrict the chances of airlines from northern countries of capturing traffic destined to places outside the region. Thus, as the northern countries did not grant southern countries the right to land in their cities to take on traffic to the north, southern countries have implemented policies preventing northern countries to take on traffic in them destined to the north.

Protectionist policies adopted by all countries in relation to their own airlines, as evinced in restrictions to operate in the northern market, and to a lesser extent, in the limitations imposed by the southern countries by denying basic freedoms to northern countries, have become obstacles to any integration effort.

The South American Regional Market and its Economic Viability

The business structure of most companies is designed to respond to extra-regional traffic, especially to the United States and Europe; therefore, intra-regional traffic is strongly associated with that objective.

Many air transport companies in the region started their business providing efficient regional services and domestic *hubs* in the interior of their home countries. When they started to grow and became more profitable, they began to increasingly run more flights to large cities and became international. It happened quite often that, once at that point, companies collapsed because they started competing with little capital and traffic²¹ against large companies working with scale economies and controlling transport markets through their reservation systems, a key factor in this market. In the two international online systems available today to choose flight combinations, the companies of the region have little or no control at all. This has forced many companies to become members of alliances such as One World or Skyteam.

With an adequate aircraft fleet, regional markets could be very profitable. But there has been a cultural tendency to manage larger companies. Perhaps this is the reason why a State intervention process is needed to promote the creation of companies capable of developing the regional market, taking into account how complex and difficult the South American geography is.

Latin American, particularly South American, integration should work on CAN's proposal to fully liberalize the South American skies. Should this happen, regional flights would be more

²¹ Air traffic in Latin America and the Caribbean accounts for 7% of the world total traffic.

frequent, and there would be more possibilities of entering into agreements to provide extra-regional services and to compete together against large international airline companies.

In the field of air traffic, this is not a mere question of building infrastructure or putting capital at stake, but rather of reaching political agreements based on a broader and clearer picture of the commercial air transport reality in the region. If such agreements were reached, South America would have more services at lower fares.

A. 2. Transport Modes: Railway Integration²²

Concerning the potential for railway integration, it is sensible to recall the availability of intermodal merchandise trade and transport corridors at the regional or continental and inter-continental levels.

Within these intermodal corridors, railways become relevant when they can rely on multimodal logistics platforms (and feeders) in strategic sites along their route.

The railway serves land access to seaports best, given the transport volume of vessels; therefore, most countries use the port/rail interface. South America is a good example of this, since more than half of its exports—in terms of tons—arrive at ports by train.

The potential for railways to play a role in these intermodal corridors would bring about several advantages. In general terms, it may be stated that, for some services, the efficiency of the railway cannot be surpassed by any other mode of transport.

These advantages become evident in cases such as: bulk transport of agricultural and mineral bulk products; the possibility of having double-stack container wagons; and transport of hazardous products (along distances longer than 300/400 kilometers).

The environmental attributes of railways are among the most advantageous ones, for example:

i) Savings in non-renewable energy

- A train consumes some 4 liters of fuel per ton of cargo every 700 km (trucks consume three times that quantity of fuel). Cargo trains are three times more efficient in fuel consumption.

ii) Gas emissions

- Gas emissions are directly related to energy consumption: gas emissions caused by railways transporting one ton along some 700 km is 2/3 less than those caused by trucks.

iii) Road decongestion

- A train may transport the cargo of 280 or more trucks, alleviating road congestion and deterioration.

In South America, there are currently two integrated railway macro-systems:

²² This subsection is based on the presentation by Mr. Jaime Valencia in the 2009 edition of the Workshop.

1- The meter-gauge system, covering more than 36,000 kilometers of tracks, in Argentina, Bolivia, Brazil and Chile.

2- The standard gauge (1,435 mm) system, covering more than 4,000 kilometers of tracks, in Argentina, Paraguay and Uruguay.

There is potentially a third macro-system, with broad-gauge (1,676 mm) tracks, which can be created with the physical connection of the Argentine and Chilean systems, as provided for in the Central Trans-Andean and Southern Trans-Andean rail projects, the union of which would create a single macro-system with more than 20,000 kilometers of rail tracks.

Within these macro-systems, priority can be given to large cargo-concentrating corridors. Such corridors should have a traffic flow not interrupted by changes of gauge or transport mode, and their intermodality would rest in their access to river or sea ports and their feeders.

As a preliminary selection process, it should be noted that the subregion made up of the inland areas of Argentina, Brazil, Bolivia, Chile, and Paraguay has a special situation in terms of transport logistics costs in order to competitively access overseas markets and, at the same time, attain regional integration.

In the context of the Integration and Development Hubs, as defined by IIRSA, it is possible to identify several railway corridors, including:

- Central Interoceanic Hub

- Santos - Corumbá (Brazil)
- Puerto Suárez - Santa Cruz/Aiquile - Oruro - La Paz (Bolivia) - Puno - Ilo - Matarani (Peru) - Arica - Antofagasta - Iquique (Chile)

- Capricorn Hub

- Option 1: Porto Alegre/Rio Grande (Brazil) – Corrientes – Resistencia – Salta (Argentina) – Antofagasta (Chile)
- Option 2: Paranaguá/Foz do Iguacu (Brazil) – Ciudad del Este – Pilar (Paraguay) – Resistencia – Salta (Argentina) – Antofagasta (Chile)

- MERCOSUR-Andean Market Hub

- Buenos Aires – La Quiaca (Argentina)/Villazón – La Paz (Bolivia) – Puno (Peru)

The international transport of goods by railway requires, on account of the characteristics of this mode as a system, a set of rules to regulate its technical and operational aspects, as well as the conditions to access international rail tracks. In this regard, the Agreement on International Transport (ATIT, in Spanish) – Railway Mode, which dates back to 1990, is worthy of note. The experience in other regions of the world (Europe, North America) shows that a common set of rules is a necessary condition for the development of international rail transport and its integration.

B. Border Integration²³

Economic integration is clearly associated with international border crossings; in practice, a border can be seen as a reflection of how mature institutional integration processes are.

Thus, *border crossings* together with *integration hubs* are key elements in joining countries. The profitability expected from the construction of an international road, for example, can only be obtained with a border crossing designed to facilitate transport.

A border crossing may be defined as a set of physical, organizational and procedural elements needed so that people moving and goods being moved can cross the border dividing two countries, in compliance with the requirements and controls imposed by their respective national authorities.

International border crossing efficiency is much needed, far beyond bilateral trade reasons. Countries impose a series of totally legal controls to safeguard their physical and tax integrity. Procedures at border crossings concern customs controls, as well as the border guard, the migration and police departments, as determined by each nation.

The traditional rationale for border facilitation seeks that people, goods and vehicles are subject to the least possible delay at the crossing. Thus, an efficient control at border crossings benefits users and enhances competitiveness, by reducing typical border wait times. Border facilitation concerns institutional and political aspects as well as the governments' capacity for management and planning, and requires a comprehensive use of the infrastructure available at border crossings.

When discussing the way to strengthen the local and regional capacity for managing border areas, the concept of *border integration* is introduced. Border development is a process whereby borders are incorporated as active assets into national development plans and strategies. National policies for border development should promote economic and physical infrastructure projects, improve public service provision, encourage production activities, and strengthen the capacity for local and regional management in such areas.

Desirable Border Crossings

A “desirable border crossing” may be defined as the one having the following features:

- Physical and functional integration of controls, enabling vehicles and goods to be *examined only once*.
- Infrastructure suited to accommodate all customs modalities, as provided for in applicable laws.
- Appointment by the countries concerned of an administrator or manager of the integrated control area, commissioned with the task of coordinating and controlling all agencies

²³ This subsection is based on the presentations by Mr. Hernando Arciniegas and Mr. Ricardo Sicra in the 2008 and 2009 editions of the Workshop.

involved and interacting with their respective headquarters, other governmental departments of the countries concerned, and private agents, in order to propose any organizational, infrastructure, regulatory and procedural change required to enhance efficiency at the border crossing.

- The availability of an Advisory Council, made up of the entities concerned and the private users of the crossing.
- Adequate staff, in number and profile, for each department, estimated according to the standards derived from integrated control routines.
- Interconnection of the IT systems of equivalent entities of both countries.
- Private participation in the provision, maintenance and enlargement of the necessary infrastructure and equipment, to be compensated with private user fees paid for requested services or with road tolls if it were a new physical interconnection.
- The political decision by the countries concerned to authorize the development of all the operational modalities provided for in the regional rules in force: exports, imports and customs transit.
- The countries involved and the border crossing manager should develop on-going training opportunities for the different actors internally or externally related to the border crossings so that they gain better insight into and up-to-date information on border crossing rules and processes; this will result in fewer errors and greater efficiency.

The features of border crossings, the infrastructure available, and the agreements entered into by governments will determine whether the integrated centers to be developed will fall into the category of Unified Centers, Integrated Control Areas for Cargo in one country and for Passengers in the other country, or Integrated Centers based on the “country of entry of goods to the agents’ home country” approach.

Border Policies in the Region

South America has a feature unlikely to exist in other parts of the world. Both CAN and the MERCOSUR (including Chile) have passed laws on international transport and border crossing integration that do not require much amendment to ensure their efficiency. The main drawback with such laws is that they are rarely put into practice. A most typical example is Resolution 502 of CAN, a very modern law promoting the physical and functional integration of border controls, which however member countries have not yet adopted. In fact, it has been enforced for passengers but not for goods.

In practice, there have been some difficulties in implementing Border Integration Zone policies, due to the following reasons, among others: lack of continuity in the joint planning of border development; few advances in the simplification and standardization of border-related documents and formalities; insufficient coordination of migration, customs, police, traffic, transport, agricultural health, tourism, health, and other services; deficiencies in defining and promoting a binational portfolio of physical, social and productive infrastructure; limited support from national institutions concerned with border development policies in each country; lack of coordination between binational authorities located in Border Integration Zones, and insufficient coordination with the civil society.

C. Energy Integration²⁴

Energy integration may be understood as a process involving the strategic interconnection of energy networks in international corridors, which allows —under a common regulatory framework— the dynamic and efficient distribution of energy in a given integration space.

Some of the advantages that can be associated with integration are: a) tapping of scale economies; b) improving system reliability; c) making an integrated use of renewable resources; d) reducing energy costs and prices; e) causing a positive impact on the environment, with a view to facing climate change challenges.

However, despite its potential advantages, energy integration is still far from a true reality in the region. There has been little progress and efforts have been focused on building electricity and gas interconnections. Attempts at achieving energy integration at the multilateral level have not been very successful, although some progress has been attained at the bilateral level. As far as cooperation is concerned, there have been some fuel supply agreements entered into and some activities jointly performed by petrochemicals, refineries, etc. The gas market is the least developed, whereas the electricity sector has witnessed some major progress in the region.

Recent History of Energy Integration Initiatives

In the energy integration sector we may identify several initiatives and agreements. Firstly, from a historical point of view, a turning point in South American energy integration has been the construction of large binational hydroelectricity projects in Southern Cone countries, namely Salto Grande, Itaipú and Yaciretá, more than three decades ago.

At the beginning of the energy market deregulation and liberalization processes, a new context was created for regional energy trade. This is why in the early 1990s the so-called “Hemispheric Energy Initiative” (HEI) was launched by the United States in the framework of a modernization process for the energy sector.

The actions and guidelines of this Initiative were defined at the first Presidential Summit of the Americas held in Miami in 1994, precisely when the FTAA was launched. In the plan of action, the Governments considered that sustainable economic development required energy cooperation in the hemisphere, as well as increasing investments in the sector. Therefore, there was a need to eliminate obstacles to foreign companies operating in all the branches of the energy industry, from gas and oil exploration and production to distribution and retail sales.

Some of the common measures adopted in the region were that the countries liberalized their investment treatment regimes, from exploration and production activities to distribution and retail sales. Among other measures, the following can be mentioned: (i) rational granting of subsidies;

²⁴ This subsection is based on the presentations by Mr. Hugo Altomonte in the 2009 edition of the Workshop and by Ms. Ariela Ruiz Caro in the 2008 edition of the Workshop.

(ii) fuel and electricity price adjustments; (iii) reforms in companies' organizations with a view to cutting down on expenses; (iv) incentives to the entry of FDI through an attractive tax system; (v) vertical and horizontal disintegration of electricity and gas companies; (vi) privatization of State-run enterprises; (vii) creation of electrical energy markets.

With the advent of the new millennium, energy liberalization policies started to be revised and the privatization process in the electricity, water supply, oil and gas sectors lost momentum. In some cases, the process was interrupted and in others, like Bolivia, a re-nationalization process was encouraged. A new energy cooperation and integration approach emerged accordingly. The preservation of non-renewable resources and the planning of energy markets as instruments to point to public and private investments for developing energy markets have gained a more active role.

Energy integration proposals based on privatization models, liberalization and deregulation of sectoral companies lost support in South America, and the integration approach changed into one with a more active role of the State. Therefore, in statements by the Latin American Energy Organization (OLADE) and in successive activities by the South American Community of Nations (CSN) and the Union of South American Nations (UNASUR), South American authorities have agreed on steps towards energy cooperation based on the sovereign right of countries to establish their own sustainable development criteria and respect the different forms of ownership adopted by each State for the development of its energy resources.

In particular, two statements modified the panorama of South American energy integration, namely the Declaration of Caracas (September 2005) and the Declaration of Margarita (April 2007), both encouraged by Venezuela. Among the most relevant definitions therein, the following stand out:

- i)* The sovereign right to establish the criteria that will ensure the sustainable development in the use of renewable and non-renewable natural resources.
- ii)* Regional integration in the search for complementarities among the countries in the balanced use of the resources.
- iii)* Promoting the development of integration infrastructure through joint investments.
- iv)* Fostering the development of renewable energies.
- v)* Recognition of the potential of biofuels to diversify South America's energy matrix.
- vi)* The importance of assuring compatibility between the production of all energy sources, agricultural production, environmental preservation, and the promotion and defense of decent social and labor conditions, thereby ensuring South America's role as an efficient energy producer.

Main Initiatives

In this context, the most relevant energy cooperation initiatives in South America in the last years have been the following:

- a) Several regional initiatives for fuel supply can be mentioned. An important antecedent was the San José Accord (1980), whereby Mexico and Venezuela agreed to jointly supply 160,000 daily barrels of crude oil to Central American countries; between 20% and 25% of the turnover was used to finance these countries' export products. Later, the Caracas Agreement of Energetic Cooperation (2000)

established the sale of crude oil or refined products based on a 15-year payment term for capital amortization, with a grace period of up to one year for capital repayment and an annual interest rate of 2%. However, these agreements have been superseded by the Petrocaribe and Petroamérica agreements, comprising the same countries and offering more advantages than the previous arrangements.

b) Petroamérica: This is a strategic alliance between national operators to ensure energy supply in the region, which was encouraged by Venezuela. This alliance regards regional integration as an issue for States to resolve and relies on economic complementarity. Petroamérica encompasses three subregional energy integration initiatives: Petrosur, comprising Argentina, Brazil, Venezuela, and Uruguay; Petroandina, involving the countries within the Andean Community of Nations (Bolivia, Ecuador, Colombia, Peru); and Petrocaribe, the agreement for the creation of which was signed by 14 countries in the Caribbean region. The latter is the only one that is currently operational.

The cooperation areas defined involve, among other things: *(i)* direct negotiations among the States to eliminate intermediaries and lower transaction costs; *(ii)* identification of cooperation areas and bilateral agreements among companies and/or governmental entities in matters of supply of crude oil and products; *(iii)* development of infrastructure and financing, design, construction and joint operation of refineries; *(iv)* facilities for storage and terminals; *(v)* joint marketing of crude oils, products, gas, asphalts and lubricants; transport and logistics; *(vi)* joint exploration and exploitation of oil and gas; gas processing and marketing; *(vii)* joint development of petrochemical industries.²⁵

c) The Mesoamerican Energy Integration Program (2005): The rules of the market are the key criteria for its implementation. Some of its goals are: *(i)* construct a high conversion refinery of crude oil (with a capacity for refining 230,000 barrels per day); *(ii)* construct a gas pipeline (connecting Mexico and Colombia); *(iii)* construct an electricity generation plant within the framework of the Central American Electrical Interconnection System (SIEPAC); *(iv)* harmonize environmental regulations in the energy sector.

d) Another scheme worth mentioning is that of Brazil and the hemispheric approach to ethanol production. In this process, some landmarks can be identified: in June 2006, the Brazilian Minister of Agriculture and the US Governor of La Florida state discussed a proposal known as “A Hemispheric-wide Approach to Ethanol,” whereby production goals were laid down: almost 10% of the current national demand for gasoline and twice the amount established in the Energy Law passed in 2005 in the country. In December 2006, the Inter-American Ethanol Commission was created with the purpose of promoting ethanol production. Then, in March 2007, the Bush-Lula Ethanol Deal was signed in order to boost the development of ethanol production and export. Furthermore, it should be added that there is a common tendency among the other countries of the region to encourage the development of biofuels in different manners, and some of them have even set ethanol and biodiesel production goals. However, it should be pointed out that no agreements or regulations at the subregional level are in force.

²⁵ Source: PDVSA Website.

e) Finally, a set of energy cooperation arrangements entered into in the framework of integration agreements are listed below:

a) CAN: Decision 536, adopted in 2002, establishes a general framework for subregional interconnection of electric power systems and intra-Community exchange of electricity among its member countries.

b) MERCOSUR: Legal regulations on energy integration at the MERCOSUR level have not yet attained the expected results vis-à-vis its potential. The most important regulations are two decisions approved by the Common Market Council (1998 and 1999). The first one relates to the exchange and integration of electricity, and the second one, to the exchange and integration of gas supply.

c) ALADI: As from the 1990s, some agreements have been entered into in the fields of electricity, gas and oil, as well as in energy cooperation and integration. Argentina and Chile are the countries that have taken more advantage of such instruments in order to regulate their trade in the electricity and gas sectors.

Electricity Interconnection in South America

With regard to electricity interconnection, the basic requirements for its inception involve aspects such as governmental agreements, system planning, investment policies, regulatory schemes, and standards for the building of electrical transmission lines and their complementary systems,²⁶ as well as rules for public and private investment.

Likewise, advances in electricity interconnection would foster the creation of a regional electricity market, which would encourage regulatory convergence or harmonization. This would cover the following dimensions: a) remuneration of power generation; b) transmission and expansion system rates; c) free access to transmission systems; d) free access to information systems; e) rights of agents; f) marketing, and g) minimum performance of the electric power system, in terms of its reliability.

Gas Integration in South America

Another relevant issue is the potential for gas integration. This is discussed in Kosulj [2004], where the author points to the few interconnection nodes and competitors that the sector has and to the current difficulties to attain potential gas integration. On the one hand, there are physical barriers in the location of gas reserves. About 75% of proven reserves is estimated to be in the Andean countries, which have a relatively low consumption rate and not very diversified markets vis-à-vis those in the Southern Cone countries. Added to this, distances between deposits and consumption centers demand high investments in transport.

²⁶ See Muñoz [2004].

On the other hand, there are regulatory barriers, which lead to the following consequences, among others: i) the region has an ample diversity of market structures and price policies; ii) differences between domestic and export prices; iii) differences in the market restructuring models; and iv) lack of specific institutions with the political power required to move forward in integration processes.

III. CONTRIBUTIONS BY IIRSA TO TERRITORIAL PLANNING

The forum opened by IIRSA has encouraged innovations in the development of project planning, prioritization and management techniques and tools—in terms of the territorial dimension and the regional vision of infrastructure—as well as the integration of sectors that are complementary to transportation, energy and communications, taking into account the most relevant social, economic, environmental and competitive aspects.

This section presents the most significant aspects of the accomplishments by IIRSA in relation to the following:

- i) Territorial planning;
- ii) Strategic environmental and social evaluation (EASE);
- iii) Production and logistic integration;
- iv) Evaluation of investment projects and methodology for transnational projects.

A. Territorial Planning and Coordination by IIRSA²⁷

Development of Territorial Planning Methodologies at IIRSA

The application of the indicative territorial planning methodology has enabled the twelve South American countries to accomplish the goal of forging consensus around the creation of a common, structured integration infrastructure project portfolio in the areas of transport, energy and communications. This portfolio has contributed to strengthening the organization of the South American territory under the vision of Integration and Development Hubs (EIDs), reinforcing the links between the projects and their surrounding space as well as improving the logistics functionality of investments.

The first stage of IIRSA's Indicative Planning, developed between 2003 and 2006, helped the countries in the region shift their infrastructure planning from the national to the regional perspective. For the first time in the South American history, a regional project portfolio was built by consensus, made up of 351 projects classified into 41 Project Groups and 8 EIDs for a total estimated investment of USD 37 billion.

The methodology for the analysis and classification of the projects identified in the South American EIDs is based on the key concept of choosing the territory as a fundamental reference to combine the economic, social and environmental dimensions of the sustainable development process pursued through the integration of the South American countries' infrastructure.

The methodology used for the analysis of the project portfolio has the following goals:

²⁷ This subsection is based on the presentations by Mr. José Paulo Silveira in the 2008 edition of the Workshop and by Mr. Mauro Marcondes-Rodrigues in the 2009 edition of the Workshop.

- i) Organize projects synergically so that they may have a greater impact than they would if taken individually.
- ii) Mobilize knowledge already available in a participative process in order to define economic, social, and environmental impacts of project groups.
- iii) Organize the project portfolio and define priorities from a consensus perspective.

Territorial planning assumes political borders to be an abstraction in order to enable cooperation and a shared vision of the integration of infrastructure. This shared vision is the starting point in a consensus building process concerning the relative importance of projects and their priority.

Stages in the analysis of projects

- i) Grouping projects in each Integration and Development Hub

Projects are grouped under a criterion of synergy, based on the possibility of capitalizing on the positive externalities of a set of investments, which may be larger than the effects of its individual component projects. Synergy is said to be vertical when projects are grouped on the basis of input-output relations, within a functional chain (road, waterway, port interconnection). It is horizontal when the group uses common resources for different purposes (river, locks, hydroelectric power stations).

The grouping process is carried out by multinational teams, is territory-based and takes into account the location of projects, their relationships with prevailing or prospective economic activities, and related environmental and social aspects. The effects of a project group constitute its *strategic function*, which should be consistent with the strategic vision regarding the sustainable development of the geo-economic space that is the area of influence of the group.

Projects are grouped around a project identified as the *anchor project*, which should have a catalytic-synergetic power to account for the creation of such group revolving around it. It is not necessarily the largest-sized project, as it is often identified as the bottleneck or missing link in the infrastructure network hindering the optimum use of the group's combined effects. The anchor project may be an already implemented project.

- ii) Analysis Factors

The analysis factors to identify each project group's attributes are established in terms of: (a) its impacts on regional integration and sustainable development; and (b) its implementation feasibility conditions.

With regard to the first item, it is important to take into account the economic dimension (increased trade in goods and services, attraction of private investment in productive units, increase in competitiveness), the social dimension (creation of employment and income, improvement of the population's standard of living), and the environmental dimension (conservation of natural resources and environmental quality).

Concerning the viability of project implementation, it is important to consider elements related to feasibility (adequate institutional and regulatory framework, consistency of current and future demand, environmental risk mitigation possibilities, and execution and operation conditions); financing (capability to attract private and/or public-private investments, and the public sector's investment capacity), and political convergence, understood as the degree and asymmetry of country convergence regarding the implementation of the transnational project group.

At IIRSA, a multi-criteria analysis model was adopted, through which the factor structure can be weighed with the support of a software tool (*Expert Choice*) designed to facilitate decisions of this kind, which after all are of a political nature. The model facilitates consensus building, since it deals with decision aspects or criteria such as the impact of a given project group on social inclusion and human development, the population in the area of influence and mobility, economic activities, etc. Furthermore, the software weighs the value of projects if projects compete with each other or are complementary in meeting existing demands in the territory, among other benefits.

This decision-support software encourages the conduction of a monitored group discussion to collect opinions on the relative importance of projects, so that in every ballot the degree of divergence in the opinions collected is shown, indicating the issues that need further discussion as well as those that have reached a statistically significant convergence of opinions.

iii) Assessment of project groups

The assessment of project groups should engage people from different areas related with its *strategic function*, such as technical experts in planning, foreign trade, industrial and agribusiness competitiveness, tourism and related services, social development and the environment. For *specific sectoral process aspects*, specialists in the fields of transport, energy and communications infrastructure also need to be included, and in *finance-related matters*, technical experts from planning, public investment and budget-related agencies must be involved.

Project grouping in each EID is assessed in team work by participants, with the support of the multi-criteria analysis instrument already mentioned.

B. IIRSA and the Environmental Issue: The Strategic Environmental and Social Evaluation (EASE)²⁸

Infrastructure development causes several environmental impacts, which may be classified as direct or indirect and cumulative. Among the first ones, we may include loss of soil, loss of vegetation, different forms of erosion, and soil and water pollution. Among its indirect and cumulative effects, reference can be made to colonization, uncontrolled urban and industrial growth (giving rise to the so-called “fishbone effect”), deforestation, and industrial exploitation of natural resources.

²⁸ This section is based on the presentations by Mr. Guillermo Espinoza in the 2008 edition of the Workshop and by Mr. Cristian Franz-Thorud and Mr. Alfredo Paolillo in the 2009 edition of the Workshop.

To deal with the different identifiable effects there is a set of management tools, i.e. specific operational mechanisms to point to the achievement of environmental results. Such instruments can be of a preventive, control, restoration, economic, financial and information nature, among others.

In the case of direct impacts, mention can be made of environmental impact studies and several *command and control* actions, involving surveillance, prevention, mitigation and restoration. For indirect impacts, there are actions related to *shared responsibilities*, including strategic environmental evaluations, and territorial planning and organization measures.

For a variety of reasons (policy-related, no capabilities available, etc.), assessment tools are usually applied at each project level, resulting in the atomization of environmental analyses; consequently, no proper attention is given to the territorial issues or cumulative impacts of projects, despite their relevance.

Thus, the different scope behind the various evaluation schemes can be identified. Environmental impact assessments (EIAs) are used to determine the direct impact of building and managing individual projects, as a result of which mitigation and restoration actions are decided. Furthermore, strategic environmental assessments (SEAs) seek to identify the consequences of project development at the territorial level, pointing to environmental and social risks and threats associated with project execution as well as to opportunities for development, prevention or solution of conflicts.

It may be said that a weakness of South America in the environmental field is that it lacks a consistent approach as to how to carry out strategic environmental assessments. There is a *family or set* of strategic environmental assessments (regional, sectoral, of cumulative impacts or sustainability) about which there is no consensus on how to approach these aspects. Reaching this consensus is a relevant challenge.

In line with this, IIRSA has encouraged the development of the strategic environmental and social evaluation (EASE, in Spanish). This new tool, designed to support decision-making processes, with a more strategic focus on the analysis of territorial interventions, seeks to supersede, without excluding it, the environmental impact assessment, which has no strategic perspective since it focuses on the project level. Thus, EASE has been conceived to be applied to IIRSA project groups, which include vast territorial extensions and have a binational or trinational scope.

Scope and Objectives of the IIRSA-EASE Methodology

The strategic environmental and social evaluation (EASE) methodology seeks to contribute to analyzing the impact of investment projects by using a more strategic approach, in compliance with the requirements from the International Association for Impact Assessment - IAIA (2001), i.e. it is integrated, sustainability-led, focused, accountable, participative and iterative.

The IIRSA-EASE methodology deals with complex decisions inherent in environmental and social management, territorial dynamics, and social and institutional organization, by means of processes,

procedures and instruments applicable to the different scopes of action. It calls for the leadership of teams made up of IIRSA's national coordinations, officials from governmental agencies, and experts in the different areas of study. This imposes a restriction in the sense that this methodology cannot rely on consultations to the civil society, as is typical of environmental impact assessments.

Basically, the EASE methodology has the following goals: *(i)* enhance understanding of the territories to leverage their sustainable development and maximize the benefits of the project groups; *(ii)* measure impacts, critical aspects and vulnerable areas; *(iii)* identify socio-environmental development opportunities in the areas of influence of the project groups; *(iv)* establish action lines and related investments capable of generating more sustainable development options and provide recommendations for the configuration and implementation of the project groups; *(v)* create an enabling space for participatory activities and constructive dialogue among governments and key stakeholders in the area of influence of the project groups at IIRSA.

The methodology has five components: project groups, participants, areas of study, conceptual work premises, and tools. The implementation phases of the methodology include approximation and planning; gathering, systematization and analysis; consultation and validation on the field; preparation of the preliminary assessment document; feedback and adjustment, and preparation of final results.

A series of constraints need to be admitted. For example, the impact of specific projects within IIRSA's project portfolio are not assessed (this is neither an EIA for individual projects nor a tool to replace it). The implications of the series of policies, plans and programs of the countries willing to work towards infrastructure integration are not assessed either. Furthermore, the EASE methodology does not develop linear or standardized methodological processes and, as no specific impacts are analyzed, no particular actions to deal with direct or indirect impacts caused by individual projects are defined.

Despite all this, as EASE combines different tools, methodologies, approaches and visions (granting it a multi-phase and iterative nature), it defines a set of strategies and lines of action aimed at the sustainable, comprehensive development of territories and economic sectors, seeking to overcome the limitations of an environmental impact assessment applied at the project level, as well as to influence project design, execution and follow-up, as appropriate.

The EASE process generates the following outputs:

- Consolidated information about the territory;
- Identification of development scenarios focusing on strategic factors, trends, implications, risks, potentialities, and opportunities, particularly indirect, synergetic and cumulative;
- Identification of key stakeholders and incorporation of their opinions in terms of the analysis of environmental and social features and of probable strategies for action and recommendations;
- Identification of courses of action (plans and/or programs) to promote the sustainability of the territory associated with the project group, including an estimation of the economic investment requirements;

- Recommendations of possible modifications to the planning, design and execution of the projects included in the project group, such as options for design, social and environmental management, etc.;
- Evaluation of the institutional capacity required to implement the environmental and social management guidelines as well as the recommendations resulting from IIRSA-EASE;
- Follow-up indicators about the evolution and behavior of actions and territories to be developed.

C. Logistics and Production Integration Methodology²⁹

As already stated, the development of infrastructure, in particular integration infrastructure, will impact on transportation costs if it manages to reduce the *economic distance or gap* (trade costs and time) between locations, thus enlarging markets and, therefore, having an impact on territorial agglomeration and dispersion forces.

Thus, the decision as to where to invest in infrastructure has relevant effects, by influencing the establishment of new businesses and other capital investments. For these reasons, it is significant to gain a better insight into the territory to enhance its development and optimize the benefits derived from the infrastructure to be developed, as well as to measure and identify opportunities for production development and elimination of bottlenecks hampering logistics flows in the areas of influence of such infrastructure.

Within the framework of IIRSA and with the purpose of establishing guidelines for management and related investments in order to improve the impact of the project groups associated with the different EIDs, a methodology has been designed for the analysis of the potential for production integration and value-added logistics services (IPr and SLVAs – IIRSA). This is the product of several accomplishments and modifications derived from its application to several project groups between 2007 and 2009, which enabled a better adjustment of this methodological proposal to the information available and to the national teams' real capacity for its application.

Before presenting the main objectives and steps of this methodology, some relevant concepts are worth mentioning.

Regional Production Integration (IPr, in Spanish) can be defined as the process of gaining greater production specialization by the countries that become integrated. Production integration takes place through the creation and strengthening of backward and/or forward linkages in production chains that have links located in two or more countries of the region.

Value-added Logistics Services (SLVAs, in Spanish) are a set of operations that add commercial value without altering the nature of the product and that exceed transport and storage; for example, cargo consolidation and deconsolidation, labeling, classification, quality control,

²⁹ This subsection is based on the presentation by Mr. Rinaldo Barcia Fonseca in the 2009 edition of the Workshop and in Barceló Koser and Barcia Fonseca [2009].

assembly, disassembly, splitting, packaging and conditioning, order picking, document preparation, etc.

Logistics Infrastructure With a Regional Vocation: This expression refers to infrastructure related to a project group that may be used for the transportation and storage of and the provision of value-added logistics services to goods that are produced, consumed or transported at the regional level. Included in this definition are, for instance, distribution centers for the storage of products to be consumed in different countries, or warehouses that support consolidation and deconsolidation operations at border crossings.

Scope and Objectives of IIRSA's IPr and SLVAs Methodology

The methodology offers the procedures necessary to conduct the assessment of the potential for production integration and development of value-added logistics services in the area of influence of a project group within an EID.

More specifically, the methodology presented here seeks to:

- a) identify the potential of IIRSA's project groups for contributing to IPr in their area of influence;
- b) identify the potential for the development and diversification of logistics services that add value to the production of the area of influence;
- c) formulate and test hypotheses concerning the potential for IPr and for the development of logistics services that may arise from IIRSA's project groups;
- d) identify obstacles, difficulties and problems that hinder the production integration and/or logistics development processes;
- e) identify investment opportunities that might be tapped by the public or the private sector;
- f) identify possible infrastructure projects, complementary to one or more projects included in an IIRSA's project group, which may enhance the efficiency of the impact of infrastructure on the IPr and SLVA development processes;
- g) incorporate structured consultation with the private sector into the analysis, thus enabling the creation of a mechanism to facilitate dialogue in the area of influence of IIRSA's project groups.

This methodology consists of four steps:

Step I: Definition and characterization of the area of influence. This involves several phases related to the definition of the area of influence, its general characterization and an analysis of the production network and its breakdown into production and logistics chains.

The expected outputs of Step I include:

- Map of the area of influence;
- General characterization of the area of influence of the project group;
- Production and/or logistics breakdown.

Step II: Preparation, implementation and analysis of the field work. In this case, the phases involved include: formulation of hypotheses on the existing production integration and the process of and potential for IPr in the selected chains (as a consequence of the implementation of projects) and on the potential for SLVA development; implementation of the field work, which involves collection of primary information.

The expected outputs of Step II include:

- Hypotheses on the potential for IPr and SLVA development;
- Interview guides or questionnaires;
- Actors involved in the production and logistics chains identified;
- Problems, obstacles and difficulties identified;
- Public or private investment opportunities identified;
- Complementary projects;
- Structure and dimensions of the (production and/or logistics) chains;
- Confirmation of hypotheses concerning changes in the production and logistics dynamics.

Step III: Projects and actions proposed and assessment of their impact on the development of the area of influence. This involves the compilation and classification of the projects and actions proposed; their combination with complementary projects and business opportunities; and finally an assessment of the impacts of the set of projects and actions on IPr and SLVA development.

Among the outputs that can be expected from Step III, the following can be mentioned:

- Organized and classified projects and actions proposed;
- A set of projects, actions and business opportunities that make up a network that is interdependent with IPr and SLVA development;
- Assessment of the contribution of the projects and actions proposed to the development of the area of influence.

Finally, the conclusion of the application of this methodology will lead to:

Step IV: Recommendations for an indicative action plan.

D. Assessment of Investment Projects and Methodology for Transnational Projects³⁰

Some Basic Concepts Concerning Project Assessment³¹

The assessment of a project is a tool that enables us, through the cost-benefit analysis, to determine whether a project should or should not be implemented, i.e. if it is profitable or not. Different technical, economic and market studies provide information to estimate the expected flow of income and costs in the lifetime of a project in each possible alternative. Among the

³⁰ This subsection is based on the presentations by Mr. Juan Pacheco and Mr. Horacio Roura in the 2008 edition of the Workshop. A comprehensive study on transnational project assessment will be soon published by CAF and ECLAC.

³¹ The topics herein are complementary to the discussions in subsection C, Integration Infrastructure Provision and Market Failures, of section I.

aspects to take into consideration, it is important to decide what size suits the project best (conditioning the investment level) as well as what the best timing for its start-up is.

Three stages or phases can be distinguished in the lifetime of any project:

- i) *Pre-investment*, the stage in which a project is studied and designed and in which a prospective or ex ante socioeconomic evaluation is made. Here, the benefits and costs of the project are estimated under a set of assumptions, although some may not be quantified yet.
- ii) *Investment*, the stage in which the works are executed. The operation and monitoring phases come on stage.
- iii) *Operation*, the phase in which the work undertaken starts generating benefits and an ex post evaluation can be made, i.e. results, impacts and even beneficiaries can be measured.

With regard to the *ex ante* evaluation, two types of assessments can be made. A *cost-benefit analysis* is conducted when it is possible to identify, quantify and appraise benefits and costs. When this is not possible, a *cost-effectiveness* evaluation is made, in which analysts seek to identify and appraise the costs of two or more possible alternatives to attain the same goal.

There are basically three cost categories: *investment costs* (associated with carrying out the works); *operation costs* (concerned with staff, services, and equipment maintenance); and *maintenance costs* (small re-investments to maintain the infrastructure). The last two are incurred in the same project stage. In turn, there are three types of benefits: monetary revenue, cost savings and others, such as re-appraisal of goods, risk reduction and improved image.

Based on the benefits and costs determined, net flows can be estimated, by taking into account investments, operations, maintenance and benefits during a certain period, generally of one year. When using this flow determination, three profitability criteria typical of projects can be established, namely:

- a) The net present value (NPV), which indicates the increase in wealth in a given timeframe. The NPV is estimated from the flows of benefits and costs using the net flow and considering a discount rate, with which the values taken into account are either *discounted* or *updated*.
- b) The internal rate of return (IRR), which determines the internal profitability of the project. It may present some complexity; the IRR is supposed to be determined when the NPV is zero, but in some projects, depending on the dynamics of the flows from positive to negative, more than one IRR can emerge, in which case some adjustments must be introduced to use this profitability measure.
- c) The immediate rate of return is an indicator that shows the best timing to initiate a project. To determine this rate, a net flow of an updated year is compared against the investment. If the proportion between this net flow in a given year is greater than the discount rate, it means that this is the year in which the project should be ideally started.

When all these costs cannot be identified or appraised, cost effectiveness indicators are used:

a) The present value of costs (PVC), basically a cost flow that is *updated* or *discounted*. Its use is based on the fact that a primary health care project cannot be compared against a high complexity hospital, because the benefits derived from one or the other project will be completely different.

b) The equivalent annual cost (EAC), which is the total sum of all costs updated equitably distributed throughout different periods. The equivalent annual cost indicates how such amount of money to be invested in a project is to be distributed among each time period. The EAC provides information as to the volume of resources that should be available to maintain the project annually.

The way to capture benefits from the private and social points of view is different. A *social assessment* is required because there are *market failures*, goods with no price (there is no market for them; nobody asks for their price, but they are appraised) and because there are also *externalities*, i.e. project results that affect others but are not determined by the market. A project may entail both social benefits and social costs that need to be appraised. In fact, there are some important indirect effects on the environment and the related markets that can also be incorporated as externalities and be appraised. Normally, they are used for large-scale projects.

In addition, another reason why prices do not always reflect the true costs or benefits for society is the presence of *market distortions* generated by taxes, subsidies, import quotas, monopolies and monopsonies.

In trying to solve such market distortions, the social prices used basically involve a social discount rate, the social price of labor, the social price of the currency, and the social value for time. The social discount rate reflects the performance that society and the State demand from public funds. It is difficult to calculate and is determined for a given period of time, either five or ten years. The variables mentioned are usually determined by the agencies concerned with public investment.

When there is no market for a given good, being then difficult to determine its price, it is very difficult to estimate the benefits that might be derived from a project. In such a case, studies are made and *quasi-markets* are built, in order to get as near as possible to the value that the population would grant to a given good through *hedonic pricing and contingent valuation*. Furthermore, valuations are made using minimum cost and cost-effectiveness criteria; areas such as health and education can be analyzed with these criteria.

Assessment of Transnational Projects: Analysis and Methodology

The growing integration among countries at the financial, economic and physical levels has resulted in a growing demand for transnational infrastructure projects. Given their magnitude or because they are jointly undertaken by countries, transnational infrastructure projects have an impact on more than one country, even on non-neighboring countries. Such effects are different for the countries involved—they may bring about benefits for some and problems for others. In other words, these projects create some type of externality in other countries; many of them cause network effects (what takes place in one node affects another or even the entire network, as is the

case with electricity interconnections) and have long-term timeframes that sometimes involve decades, consequently affecting more than one generation in several countries.

A methodological approach that can be used to measure these effects and benefits is the traditional cost-benefit analysis in order to determine, within the perspective of a country, whether it is convenient to carry out a transnational infrastructure project or not from the social and economic viewpoints.

But this approach does not say much about the *distribution of costs and benefits among the countries involved*. When projects involving more than one country are analyzed, it is necessary to use tools to identify and distinguish the benefits and costs of the projects that are captured by the countries. With some modifications, this methodology is also useful to estimate the distribution of costs and benefits among the countries involved.

The conceptual framework to apply the traditional cost-benefit analysis to transnational infrastructure projects requires (i) the identification and appraisal of the sources and benefits of such projects for each country involved, and (ii) the identification and appraisal of their sources and benefits for the different stakeholders involved within a country.

These assessment tools can be applied, for example, to transportation projects. In the case of a passenger transport project, there are two types of effects:

- *Direct effects* on the users of the project, including savings in fares and accident costs, the increase in total operation costs, and the entry and exit of currency —depending on tolls and the origin of funds and passengers.
- *Indirect effects* on alternative transport means or other sectors related to the transport project, which have to do with the freeing of resources due to less journeys, savings in maintenance costs of these alternative transport means, and the entry and exit of currency, depending on the nationality of users.

In the case of cargo transportation, there are also impacts on the markets of goods. Reducing logistics costs involves reducing the price of the goods traded between the two countries; therefore, the quantity of tradable goods and, hence, of exports or imports (depending on the location) will increase. In the case of commodities exported to extra-regional markets, the profits derived from transport cost reduction will benefit the exporting country. On the contrary, in the case of goods traded at the regional level (for example, cars between Argentina and Brazil), the benefits are shared by both countries, depending on the elasticities of the supply and demand curves.

The conclusion is that it is possible to creatively apply cost-benefit analyses to transnational infrastructure projects in order to estimate how costs and benefits are distributed among the countries, thus giving technical support to the political discussion on the way to allocate such costs and benefits. Practical difficulties of this kind of analysis relate to the set of assumptions to be established (origin of traffic, alternative road designs or alternative costs, etc.), the data used (their availability, consistency and reliability), the feasibility of making the different variables taken into account operational, and the possibility of performing several estimations.

It is also possible to use more complex methodologies, such as the Computable General Equilibrium (CGE) models. In particular, these models may provide for a wide range of indirect effects in the markets of goods and services, as well as variations in the revenues for the production factors (hence, in households' welfare). They can also be designed to consider special cases of network effects associated with the development of infrastructure. However, such models also present limitations, since as they are comparative static simulation techniques and, consequently, cannot capture the dynamic effects associated with capital accumulation.³²

³² See ADB [2009].

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ANNEX

PROGRAMS FOR THE 2008 AND 2009 EDITIONS OF THE TRAINING WORKSHOP

**INTEGRATION AND DEVELOPMENT OF SOUTH AMERICAN REGIONAL
INFRASTRUCTURE**



I I R S A

INITIATIVE FOR THE INTEGRATION OF REGIONAL
INFRASTRUCTURE IN SOUTH AMERICA

INTEGRATION AND DEVELOPMENT OF REGIONAL INFRASTRUCTURE IN SOUTH AMERICA

Course organized by ECLAC and the CCT Institutions of IIRSA
October 6-10, 2008 – ECLAC – Santiago de Chile

PROGRAM

A) Context and purpose of the course

During the X and XI meetings of IIRSA National Coordinators (July and November 2007), a proposal was submitted to organize a course for technical experts from ministries and government entities concerned with the development of integration infrastructure. This proposal was approved and incorporated to the Action Plan 2008. In general terms, the course is aimed at strengthening the technical capacities of the teams that cooperate with IIRSA National Coordinations.

Its purpose is to level knowledge and help officials involved gain insight into a perspective of the political economy concerned with the problems created for the development of integration infrastructure. The activity seeks, then, to provide officials with conceptual frameworks, empirical information, evaluation techniques and debates to enhance their analytical background.

Integration and infrastructure are the two areas whose intersection is the analytical core of the course, which has a multi-disciplinarian (with the participation of specialists from different fields) and multisectoral approach. The activity intends to approach the problems and dimensions of infrastructure integration and development in South America, issues in which IIRSA is to become a mechanism to deal with them.

B) Basic organization and teaching modality

This intensive course covers five blocs, one every day, dealing with different aspects in the relationship between infrastructure integration and development in South America.

There will be different lecturing activities combined with others geared to fostering participation, panels or workshops in team work, so as to encourage active discussions

from participants on the basis of previous readings or based on questions/answers or case studies posed by the organizers.

C) Academic coordination

The academic coordination of the course will be in charge of ECLAC and IIRSA CCT Secretariat.

D) Contents

Monday, October 6

Day 1: Integration and infrastructure: an overview

This bloc aims at introducing participants in the more general problems of the relationship between infrastructure investment, economic development and integration. The aim is to identify the main areas of analysis and criteria available rather than dealing with the problems in detail. Based on this overview, participants will be in better conditions to further enhance their knowledge on the field.

Morning

A) Opening of the course

9:00-10:45 Opening an general presentation of the course

- Laura López, Secretary of the Commission, ECLAC
- Sergio Bitar Ch., Minister of Public Works of Chile
- Ricardo Carciofi, CCT Secretariat

B) Integration and Infrastructure

11:00-11:15 Introduction to the program of the Course
Ricardo Carciofi (CCT Secretariat)

11:15-12:00 Infrastructure, productivity and competitiveness
Presentation. Ricardo Sánchez (ECLAC)

12:00-13:00 Infrastructure, institutionality and territorial development
Presentation. Patricio Rozas (ECLAC)

Afternoon

- 14:30-16:00** Economic integration and infrastructure development: situation and perspectives in South America
Panel. Mauricio Mesquita Moreira (IDB), Osvaldo Rosales (ECLAC), Roberto Bouzas (Universidad de San Andrés-FLACSO)

Classical arguments in favor of integration: market size, specialization and economic efficiency; political aspects of integration; current situation and perspectives for integration in South America.

Tuesday, October 7

Day 2: Infrastructure in South America: sectoral diagnoses

The purpose of the second bloc is to provide attendees with diagnostic elements on the status of integration infrastructure investments in South America.

Morning

- 9:00-10:45** Sea cabotage and river transportation
Presentation. Ricardo Sánchez (ECLAC) and Gabriel Pérez (ECLAC)
- 11:00-13:00** Air transportation in South America
Presentation. Jorge Kogan (CAF)

Afternoon

- 14:30-16:00** Border crossings in South America
Panel. Ricardo Sicra (Ecotransporte SA), Alfredo Fuentes (Fundación Cerrejón para el Fortalecimiento Institucional de La Guajira), Hernando Arciniegas (CAF)
- 16:15-17:45** Energy integration: problems and challenges
Panel. Ariela Ruiz-Caro (ECLAC Consultant), Marcelo Castillo (ENDESA Internacional), Hugo Altomonte (ECLAC)

Wednesday, October 8
**Day 3: Deficit, provision and financing of integration infrastructure:
fiscal aspects and participation of the private sector**

This bloc provides, first of all, an overview of the trade difficulties derived from infrastructure deficits in South America and, secondly, analyzes the elements related to fiscal, institutional and regulatory aspects involved in the provision and financing of infrastructure. Public/private partnerships (PPP), fiscal effects on financing mechanisms, typologies and problem modalities.

Morning

- 9:00-10:45** A general view of trade barriers derived from infrastructure deficiencies in South America
Presentation. Mauricio Mesquita Moreira (IDB)
- 11:00-11:30** Introductory aspects on public goods, natural monopolies and infrastructure provision
Presentation. Ricardo Carciofi (CCT Secretariat)
- 11:30-13:00** Modalities and problems in infrastructure provision
Presentation. Patricio Rozas (ECLAC)

Public-private partnerships (PPP); fiscal impact of finance mechanisms; typology and modality of problems identified in case analyses in Argentina, Colombia, Chile and Peru.

Afternoon

- 14:30-16:00** The Southern Interoceanic Hub (Peru) as an example of public-private partnership
Presentation. Francisco Wulff (CAF)
- 16:15-16:45** Summary session
Moderator. Ricardo Carciofi (CCT Secretariat)

Thursday, October 9

Day 4: Methodology for the evaluation of integration infrastructure projects

The objective of this bloc is to compare three methodologies for the evaluation of infrastructure projects in which the integration variable is relevant, paying special attention to the unique characteristics of integration projects and the difficulties encountered in their evaluation. The module will be based on work undertaken by ECLAC.

Morning

- 9:00-10:45** Basic concepts on project evaluation
Presentation. Juan Antonio Pacheco (ECLAC)
- 11:00-13:00** Evaluation of transnational projects: analysis and methodology
Presentation 1. Horacio Roura (ECLAC Consultant)
Presentation 2. Patricio Rozas (ECLAC) and Jorge Rivera (ECLAC Consultant)

Afternoon

- 14:30-16:00** Evaluation of transnational projects: case studies and exercises
Presentation. Ricardo Sánchez (ECLAC), Horacio Roura and Jorge Rivera (ECLAC Consultants)

Friday, October 10

Day 5: IIRSA

The last bloc presents the main aspects of the technical background drawn by IIRSA from its coordination activities in integration infrastructure development in South America. Mechanisms for project selection used to make up the Project Portfolio. Sectoral integration processes: general panorama of the works undertaken by IIRSA.

Morning

- 9:00-10:45** The territorial planning work based on “Hubs” and “Groups”
Presentation. José Paulo Silveira (Macroplan)

Mechanisms for selecting projects used to create the project portfolio. Sectoral integration processes: general panorama of the works undertaken by IIRSA.

11:00-13:00 Integration, infrastructure and environment

a) The environmental dimension of the development: priorities for the region
Presentation. José Luis Samaniego (ECLAC)

b) Infrastructure, Environment and Society
Presentation. Pedro Bara Neto (World Wildlife Fund -WWF-, EEUU)

c) Strategic Environmental and Social Assesment
Presentation. Guillermo Espinoza (Centro de Estudios para el Desarrollo -CED-, Chile)

Afternoon

14:30-16:00 Main problems in physical infrastructure integration and development

Panel. Pitou van Dijck (Centre for Latin American Research and Documentation -CEDLA-, University of Amsterdam), Marcel Vaillant (Universidad de la República, Uruguay), José Botafogo Gonçalves (Centro Brasileño de Relaciones Internacionales -CEBRI-, Brasil) and Fernando González-Vigil (Universidad del Pacífico, Perú).

Is physical integration a starting point or the last step in a stronger integration process? What is the experience in other regions (European Union)? Is IIRSA an efficient response to the development of integration infrastructure? What are its strengths and what are its weaknesses?

16:15-16:45 Summary and opinions from participants

16:45-17:30 Closing in charge of ECLAC and CCT representatives



I . I . R . S . A

INICIATIVA PARA LA INTEGRACION DE LA INFRAESTRUCTURA REGIONAL SURAMERICANA

C O M I T E D E C O O R D I N A C I O N T E C N I C A



INTEGRATION AND DEVELOPMENT OF REGIONAL INFRASTRUCTURE IN SOUTH AMERICA

Course organized by the CCT institutions of IIRSA

September 7 - 11, 2009
INTAL - Buenos Aires, Argentina

A) Context and purpose of the course

The Course “Integration and Development of Regional Infrastructure in South America,” targeted for governmental agents concerned with integration infrastructure development within the framework of IIRSA was held for the first time in October 2008.

As it was heartily welcomed by both attendees and IIRSA National Coordinators, the Action Plan for 2009, as stated in the X Meeting of IIRSA’s Executive Steering Committee, provided for a new edition of the same course for this year.

As in its first edition, the course is aimed at strengthening the technical capacities of the teams that cooperate with IIRSA National Coordinations. More specifically, its purpose is to disseminate knowledge, foster dialogue, and help officials involved gain insight into a perspective of the political economy concerned with the problems created for the development of integration infrastructure. The activity seeks, then, to provide officials with conceptual frameworks, empirical information, evaluation techniques and debates to enhance their analytical background.

Integration and infrastructure are the two areas whose intersection is the analytical core of the course, which has a multi-disciplinarian (with the participation of specialists from different fields) and multisectoral approach. The activity intends to approach the problems and dimensions of infrastructure integration and development in South America, issues in which IIRSA is to become a mechanism to deal with them.

B) Basic organization and teaching modality

This course deals with different aspects in the relationship between infrastructure integration and development in South America. Participants will review different conceptual aspects of integration, international trade, experiences gained in other regions, sectoral diagnoses on integration infrastructure and other issues related with IIRSA's conceptual and instrumental contributions. This review will be conducted based on specific cases.

This intensive course is aimed at fostering interaction. There will be different lectures combined with others types of activities geared to fostering participation, panels or workshops in team work, so as to encourage active discussions from participants on the basis of previous readings or based on questions/answers or case studies posed by the organizers.

C) Academic coordination

ECLAC and IIRSA CCT Secretariat will be in charge of the academic coordination of the course.

D) Contents

Please find below the Program of the course.

Tentative Agenda

Day 1: Monday, September 7th

This block aims at introducing participants to the core concepts of integration, to the aspects required to gain better insight into the current situation, and to the different strategies being currently adopted in South America. The European experience will also be discussed as it is viewed as a point of reference of a deeper and unique integration process concerning the economic as well as the political and institutional spheres. Finally, attention will be drawn to the significance of developing regional infrastructure in order to foster international trade and to the analysis of regional gaps and the design of instruments for bridging them.

Morning

09:00 - 09:30 Registry

09:30 - 10:00 Opening and general presentation of the Course
Lecturer: Ricardo Carciofi, Intal Director / IIRSA's CCT Secretariat

10:00 - 11:00 Status of Regional Integration
Lecturers: Roberto Bouzas (San Andrés University - CONICET)

- Integration. Basic concepts. Different dimensions to integration: political, economic, social and physical; what priority should be given to physical integration?
- South America as an integration bloc: current features of the process. What extent has the region attained as far as integration is concerned (UNASUR)? What problems and opportunities lie ahead in this process?
- How to reconcile South American integration with other integration initiatives (CAN, MERCOSUR, and Mesoamerica)?

11:00 – 11:15 Coffee Break

11:15 - 12:30 Infrastructure for Integration: Important European Union Experiences
Lecturer: Ramón Torrent (Barcelona University)

- Major landmarks in recent history, and the role played by physical integration in the European integration process.
- Main conflicts: asymmetries, regional disparities and their impact on the territory; environmental sustainability.
- Institutions, policies and instruments (European Regional Development Fund, European Social Fund, Cohesion Funds, European Investment Bank).

12:30 - 14:00 Break / Lunch

Afternoon

14:00 - 15:15 Physical integration, regional disparities and territorial planning
Lecturer: Antonio Filgueira Galvão (Centro de Gestión y Estudios Estratégicos - Brasil)

Infrastructure development and implementation in its various forms modify transportation costs both directly and indirectly; consequently, they impact on the dynamics of the area of influence of the territory involved. Depending on the case, regional disparities, depending on the case, may worsen if economic and social gaps broaden in the territory concerned. Given its transnational nature, integration infrastructure has specific impacts as well. In this context, several questions arise: What policies would be the most effective to reduce regional disparities? To what extent can infrastructure promote a better distribution of economic benefits to the population in the territory concerned? What role and modalities should national and local public policies assume in the development of integration infrastructure?

15:15 – 15:30 Coffee Break

15:30 - 16:45 Environment and sustainable infrastructure
Lecturer: Cristian Franz Thorud (IDB), Manuel Pulgar-Vidal (SPDA-Peru)

- What are the major challenges for South America in terms of sustainable development, environment and infrastructure?
- What social and environmental sustainability criteria should be incorporated in the integration infrastructure planning process?

Day 2: Tuesday, September 8th

This block aims at introducing participants to the basic concepts of sustainable development and infrastructure, as well as evaluation aspects of integration projects.

Morning

10:00 - 11:00 Environmental and social assessment in practice (1)
Lecturer: Alfredo Paolillo (CAF)

- A conceptual and methodological basis for strategic environmental and social assessment (EASE)

11:00 – 11:15 Coffee Break

11:15 - 12:30 Environmental and social assessment in practice (2)
Lecturer: Alfredo Paolillo (CAF)

- EASE: Its application to the Andean Hub

12:30 - 14:00 Break / Lunch

Afternoon

14:00 - 15:30 Trade barriers and infrastructure deficiencies in South America
Lecturer: Mauricio Mesquita Moreira (IDB)

- How can transportation costs be compared taking the impact of South American trade policies into account?
- What is the impact of infrastructure on transportation costs in South America? What are their main effects on regional trade?

15:30 – 15:45 Coffee Break

15:45 - 17:00 Evaluation of investments in integration projects
Lecturer: Ricardo Sánchez (CEPAL)

Day 3: Wednesday, September 9th

This block is aimed at introducing participants in the financial aspects of integration infrastructure projects and in the operation of road concession schemes in selected countries of the region, as well as at providing them with sectoral diagnostic elements on integration infrastructure in South America.

Morning

09:30 - 10:45 Financing of integration infrastructure projects
Lecturer: Francisco Wulff (CAF)

- Basic concepts regarding the evaluation of investment projects and their application to cases of integration projects.

10:45 – 11:00 Coffee Break

11:00 - 12:30 Private management of State-owned infrastructure. Analysis of recent experiences in Latin America
Lecturer: José Barbero

Afternoon

14:00 - 15:30 Sectoral diagnoses 1: diagnoses is plural...is this the intent?
Energy integration in South America: its main challenges
Lecturer: Hugo Altomonte (ECLAC)

15:30 – 15:45 Coffee Break

15:45 - 17:00 Sectoral diagnoses 2:
Border passes in South America
Lecturers: Hernando Arciniegas (CAF), Ricardo Sicra (ECOTRANS)

Day 4: Thursday, September 10th

This bloc will continue with the sectoral diagnostic reviews and present the conceptual and instrumental core background elements gathered by IIRSA in its task of coordinating integration infrastructure development projects in South America.

Morning

09:30 - 10:45 Sectoral diagnoses 3:
Air transportation in South America
Lecturer: Jorge Kogan (CAF)

10:45 – 11:00 Coffee Break

11:00 - 12:30 Sectoral diagnoses 4:
Railway integration in South America and its potential for multimodal transportation
Lecturer: Jaime Valencia (ALAF)

12:30 - 14:30 Break / Lunch

Afternoon

14:30 - 15:45 Territorial planning based on Hubs and Clusters
Lecturer: Mauro Marcondes-Rodrigues (BID)

15:45 – 16:00 Coffee Break

16:00 - 17:00 Production chains and logistics services
Lecturer: Rinaldo Fonseca (UNICAMP)

Day 5: Friday, September 11th

This block seeks to analyze possible answers to some of the crossroads posed by the South American integration issue.

Is physical integration a starting point or the last step in a stronger integration process? What is the experience in other regions (European Union, Mesoamerica)? Is IIRSA an efficient response to the development of integration infrastructure? What are its strengths and its weaknesses?

09:30 - 11:30 Main problems in physical infrastructure integration and development in South America

Panel members: José Botafogo Gonçalves (CEBRI), Ennio Rodríguez (Costa Rica), Marcel Vaillant (Universidad de la República - Uruguay)

11:30 – 11:45 Coffee Break

11:45 - 12:45 Summary and debate with participants

Presentation and discussion: CCT