The Vietnam Academy of Social Sciences (VASS), Agence Française de Développement (AFD), Global Development Network (GDN), Institut de Recherche pour le Développement (IRD), University of Nantes, École française d’Extrême-Orient (ÉFEO) and Agence Universitaire de la Francophonie (AUF) have decided to give their support to the Regional Social Sciences Summer University, referred to as “Tam Đảo Days”, in the framework of partnership agreement. This partnership has the objectives of developing a multi-disciplinary training of excellence, creating a platform for debate, and attracting a wide academic and non-academic audience from across Southeast Asia.

This work contains a verbatim account of the presentations and debates from the plenary sessions and workshops that took place from 17th to 29th July 2015 at the University Duy Tân (Đà Nẵng) on the topic of “Shared Challenges for Development within ASEAN”. Four main areas of reflection are prioritised in the framework of the thematic workshops: (i) Economic, Financial and Logistical Integration in ASEAN; (ii) Epidemiological Risks and Integration of Health Policies on a Regional Scale: Modelling to Make Better Decisions; (iii) Development Corridors in ASEAN; (iv) Cities and Climate.
Shared Challenges for Development within ASEAN

Applied and Analytical Methods

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Foreword

Each year since 2007, the "Tam Đảo School in Social Sciences" (JTD) has been offering training in analytical methodologies of the social sciences – geography, economics, statistics, socio-anthropology, history, etc. – to nearly 100 participants from Southeast Asia (students, university lecturers, researchers, civil servants, development practitioners). The training takes place both at the Việt Nam Academy of Social Sciences (VASS in Hà Nội) and in residence at the Tam Đảo hill station close to the capital, or in another university in Central or South Việt Nam.

Since 2010, A Change in the Regional Scale

Following the success of the first three editions from 2007 to 2009, and in order to support JTD’s development, the VASS Graduate Academy of Social Sciences (GASS), Agence Française de Développement (AFD), Institut de Recherche pour le Développement (IRD), École française d’Extrême-Orient (ÉFEO), University of Nantes and Agence Universitaire de la Francophonie (AUF) decided to confirm their joint commitment within the framework of a four-year partnership agreement, 2010-2013, then for the 2014-2015 period.

By building on the experience acquired over the first three years, the regional project set itself new ambitions:

• A specific theme covering a regional or international issue is chosen each year, which is then broken down and debated using different methodological and crosscutting approaches;

• The first two days of the training and exchanges are concluded by a wrap-up session that allows us to approach our debate from an interdisciplinary angle;

• In order to preserve a strong group dynamic and a wide and relevant educational approach, the trainees are divided among four thematic workshops of 20 people lasting five days. At the end of these workshops, the trainers and trainees get together for a day to present the conclusions of the analytical work of each workshop;

• In order to extend their geographical influence, the JTDs receive trainees from throughout the Southeast Asia region. This regional extension reinforces the reputation and visibility of the school in the region and allows us to widen its network of scientific exchanges and collaboration.
A Regional Platform of Partnership Synergy

Following the preceding editions organised at the VASS and at the Tam Đảo hill station (2007-2012), relocating the JTD to the Universities of Đà Lat (2013 and 2014) and then Duy Tan (2015) aimed to open up the training to a panel of trainees with diverse profiles and widen collaboration with institutions in southern and central Việt Nam.

The labelling of the JTD in the framework of the France-Việt Nam exchange year 2013-2014 gave new impetus to the scientific and educational system while at the same time emphasising its reputation for excellence. The 2014 edition also marked, at the heart of the JTD partnership scheme, the arrival of HéSam University. The financing granted met the needs of a number of shared projects: crosscutting scientific cooperation, the innovative character of the proposed platform, and its inclusion in the prospect of collaboration in terms of training programmes or research.

“Global Development Network” (GDN) 2015 and 2016: consolidation and extension to other international networks

The regional/international dimension should, however, be consolidated in order to widen scientific networking. The recognition of the JTD during the GDN “Capacity building in least developed countries” call for applications allows us today, in close collaboration with the Royal University of Law and Economic Sciences, Cambodia (RULE), to widen the scope and influence of the training proposed in Việt Nam:

• Consolidation in Cambodia and Laos;
• Expansion to Myanmar and Madagascar;
• Increased visibility by putting communication modules online in 2015 (partnerships, trainers and trainees) and recording the plenary sessions in 2016 – web site www.tamddaoconf.com.

Finally, the geographic diversity, the growing number of demands for inscription – nearly 600 applications submitted in 2015 as opposed to around 100 in 2009 – is proof of the relevance of the model proposed and its ability to meet the expectations of a diverse audience: university lecturers, practitioners and support institutions for political decision-making. After nine years of existence, the JTDs have thus shown themselves to be a recognised provider of skills in terms of capacity building and networking.

The institutional and financial support from the French Embassy in Myanmar for this ninth edition indeed underlines the wish to accompany the JTDs in Việt Nam in its regional dimension, but also to duplicate the model in other cultural areas.

An Annual Scientific Production

Since their conception, the JTDs have published, within one year, the content of the training days in its entirety. The publications are trilingual (Vietnamese, French and English) and form part of AFD’s collection – Conférences et Séminaires collection for the 2010-2015 period then Etudes de l’AFD – in
co-publication with the EFEO and Tri Thúc. The publications are downloadable free of charge on the sites of AFD, the JTD and other associated partners.

The current publication is comprised of the texts of the trainers’ presentations during the plenary sessions as well as the transcripts of the four thematic workshops. The list of trainees is included in the publication in order to encourage scientific networking; it also includes the biography of each trainer. Finally, reading lists are proposed in order to complete and give a deeper insight into the disciplinary fields dealt with.

“Shared Challenges for Development within ASEAN. Applied and Analytical Methods”

The guiding theme of the 2015 JTD was to examine the construction and development of the Association of Southeast Asian Nations (ASEAN) through the prism of human, social and economic sciences; in conformity with the logical framework, this ninth edition was organised according to two complementary axes:

- Two days of training in plenary sessions (simultaneous interpretation) on 17th and 18th July. Five presentations introduced and developed, from a methodological and multidisciplinary angle, issues linked to development challenges: historical, economic, geographic, operational, and public health approaches. The plenary sessions were wrapped up with a summary of the two days;

- Four five-day workshops, from Monday 20th to Friday 24th (consecutive interpretation), which focused on the question of economic, financial and logistic integration (workshop 1), development corridors (workshop 2), epidemiological risks and health policies at the regional level (workshop 3), cities and climate challenges (workshop 4). The training course concluded with a workshop feedback session presented by the trainees, Saturday 25th July.

By way of an introduction, Hugues Tertrais, a professor of contemporary history at the University Paris 1 Panthéon-Sorbonne, sought to review the context of ASEAN’s origins and the stages of regional construction in Southeast Asia and the end of a bipolar world: “containment” before 1990; “European style” consolidation in the 1990s; participation in Asian growth in the first decade of this century. This construction constitutes a unique regional process in Asia. A new “region” the size of Europe is being constructed between the Chinese and Indian worlds: it already carries weight and will carry even more tomorrow in the rebalancing of the world that is underway.

There are multiple challenges. Firstly, economic and social ones: growth, which is stimulated by globalisation, defines a common trajectory, even though all the States concerned do not function at the same rhythm and are not at the same level; the migrations of workers are clear evidence of current trends. Next are policies and strategies: countries that used to ignore or oppose each other are learning to live together and new balances are being established, both in the region and with different neighbouring international players (China and India) and further afield (the United States, Russia, Europe). The challenges of regional construction affect all the domains: the coordinated development of territories is being conceived on a regional scale and is progressively transforming
a “balkanised” region into a common economic zone that favours all the potentials of development that are themselves contingent on controlling transport and energy. The environmental or military risks must by no means be minimised but the “regional” edifice may precisely provide a favourable framework for regulation.

In the early afternoon, our attention turned to the challenges of regional integration and its measures with the presentation by Thomas Vallée, an economist and professor at the University of Nantes. Since its creation on 8th August 1967, ASEAN has promoted the principle of regional openness to trade in order to ensure trade liberalisation between member countries and strengthen commercial and investment integration with non-member countries in particular. ASEAN, which is based on the principle of an open economic market, has become a dynamic commercial zone and an important region for foreign investors. The pursuit of this integration should accelerate with the official launch in December 2015 of the “ASEAN Economic Community” (AEC) whose main objective is the creation, in the long term, of a common market. At the same time, ASEAN has also decided to extend its free-trade zone to non-member countries. This became apparent in the “ASEAN+ framework” as the best way to strengthen regional cooperation.

ASEAN has the third biggest population in the world, after China and India. In terms of demand, it has a large potential market to which we must add a capacity to supply productive labour. The comparative advantages between countries also allow the constitution of complementary production networks in South Asia. These characteristics raise the question of extending ASEAN to other Asian countries and accelerating integration between other countries in the region.

Thomas Vallée explores three avenues of reflection: the study of the advantages and the disadvantages of the creation of a free-trade area; the interest of pursuing integration to a supplementary stage – common market, monetary union or fixed exchange system – measuring the phenomenon of globalisation at the heart of this integration.

The day was concluded with the presentation by Nathalie Fau, a geographer at the University Paris 7 - Denis Diderot. Her presentation was based on collective research carried out between 2008 and 2012 in the framework of a research project financed by the Agence nationale de la Recherche. One of the objectives of this programme is to compare the regional integration processes in mainland and island Southeast Asia by focusing the study on economic corridors. In order to study transnational dynamics, two spaces were examined: the Greater Mekong Subregion (GMS) and the Malacca Strait.

Economic corridors were not the first development tool implemented by the Asian Development Bank (ADB) to develop transnational spaces in Southeast Asia. In the 1980s, the region witnessed the multiplication of the formation of economic cooperation zones that were known as growth triangles or development quadrangles. Subsequent to the economic success of the SIJORI “Growth Triangle” – which links together, in the same cross-border economic zone, Singapore to Johor in Malaysia and Riau in Indonesia – a second generation of cross-border cooperation flourished almost everywhere in Southeast Asia on paper. The “SIJORI dissemination” can be explained by the role of the ADB that first of all theorised this development model before extending it to the scale of the Asia Pacific front. At the end of the 1990s, the growth triangles and the cross-border zones were replaced or made more complex by the introduction of development (or economic) corridors by
the ADB. This new economic model has been most extensive in the GMS. The objective of the ADB was, at the outset, to reconstruct road structures in order to favour the renewal of economic relations between the countries of the peninsula, and thus mend the spatial fractures of the colonial period and the Cold War. The ADB has been encouraged by the success of this new model and has decided to transpose it to island Southeast Asia.

Using economic corridors as a tool for regional integration is in no way specific to Asia. The corridors were indeed made popular by the United Nations, the World Bank and big international institutions during the 2000s and they were developed in Latin and Central America as well as in Africa. These institutions seized the notion of transport corridors and adapted it to many different forms: development, trade, or even growth corridors.

The ASEAN connectivity plan (2010) fully integrates the notion of economic corridors: it starts from the premise that there is an evident link between, on the one hand, the construction of infrastructures, and the opening up of territories and making them part of a network and, on the other hand, economic development and the fight against inequalities. This premise is examined by studying the impact of corridors at different levels: local, national and regional.

The second day of the plenary sessions began with the presentation by Rémi Genevey, the director of AFD in Việt Nam and concerned the fight against climate change. The agency is the pivotal player of French Official Development Assistance. AFD is a public agency that has been committed to fighting poverty and encouraging development in overseas and southern countries for seventy years. In order to carry out these commitments vis-à-vis developing countries as far as the fight against climate change is concerned, the AFD climate strategy is organised around three central pillars: financial commitment; measuring the impact of projects; intervention selectiveness. In 2014, among the projects of AFD Group having been subjected to a significant and calculable ex ante carbon footprint, it was established that the mitigation projects co-financed by the Group will contribute to avoiding greenhouse gas emissions (GHGs) of up to 4.3 million tonnes of carbon dioxide equivalent per year. AFD views its support of the fight against climate change as one of its operational objectives in its Country Strategy for Việt Nam for the 2013-2015 period.

The last presentation was given by Marc Choisy, a researcher at the IRD in Hà Nội in the domains of ecology and the evolution of infectious diseases, and who is part of a research programme into the spatial dynamics of dengue in Southeast Asia that is being carried out in partnership with the Universities of Pittsburgh and Oxford, and the Pasteur Institute in Hà Nội.

Dengue is the leading human arbovirus in the world and affects nearly 500,000 individuals each year. This virus is an emerging one that was first confined to Thailand and Southeast Asia in the 1950s and now affects almost all the inter-tropical world. Nearly three quarters of the world’s cases of dengue occur in Southeast Asia – it is the first cause of infant mortality in Thailand. It is inevitably transmitted by the bite of the female Aedes species mosquito and the epidemiology of dengue closely depends on the environmental and climatic conditions that may affect the dynamics of mosquito populations. Unlike other vectoral viruses such as malaria, dengue is typically an urban virus whose prevalence and incidence increases according to the rhythm of urbanisation. Another characteristic of the virus is the fact that there exist four different serotypes that have complex immunological interactions with each other. This last point is why, today, a vaccine against dengue
is still being developed after more than 30 years of research – the arrival on the market of the Sanofi vaccine has been announced for 2016. The only measure for preventing and controlling dengue today is still based solely on controlling the vector.

Outbreaks of infectious diseases may be more or less seasonal and their spatial dynamic may be more or less complex. Efficient prevention and control of infectious diseases is based on models that faithfully take into account this complexity of infectious systems. In order to be efficient, these models must be parameterised (or calibrated) using data. Traditionally, the epidemiology of infectious diseases is closely monitored by surveillance systems. These systems may be developed by a hospital, a country or even the whole planet. In all cases, the surveillance systems are generally organised in the form of hierarchically structured networks. At a country level, the Ministry of Health is generally responsible for organising surveillance – the different hierarchical levels of the surveillance network coincide with administrative subdivisions (village, commune, district, province). At an inter-country level, agencies such as the World Health Organisation (WHO), Centre for Disease Control and Prevention (CDC), European Centre for Disease Prevention and Control (ECDC), UNITEDengue are responsible for coordinating and homogenising surveillance. The main difficulties related to surveillance systems come from case definition, the consistency of surveillance in time and space, as well as from the scheme of data aggregation in time and space. The efficiency of the surveillance system mainly depends on the speed and accuracy of the transmission of information through the different hierarchical levels of the network, as well as the availability for analysis of the aggregated and centralised data. Even with modern computer technologies, Internet and mobile phone networks, these difficulties widely persist.

Infectious diseases have no borders. In such a context, the epidemiology of an infectious disease that is observed in one locality may depend not only on local conditions – such as demography, as well as climatic and environmental conditions in the case of vectoral viruses such as dengue – but also on the epidemiology of faraway places to which the population in question may be connected. Succeeding in quantifying these differences in influence and distinguishing the local differences from the distant influences of an epidemiological system is both extremely difficult and yet crucial for an efficient control of infectious diseases on a large scale. Controlling an infectious disease on a regional scale for several connected populations is extremely difficult – optimal but un-coordinated local policies do not necessarily lead to an optimal global policy. Coordination is all the more difficult to carry out when the populations in question are politically and economically heterogeneous. Optimal global strategies may be grasped using game theory, whether the different populations cooperate or not. In the particular case of dengue, the choice between means of control (vectoral control and vaccination after 2016) may make the decision-making process even more complicated.

Recent optimisation algorithms from the world of artificial intelligence such as learning by reinforcement can use a model and its surveillance data to optimise a control policy in almost real time.

Finally, Krisna Uk, a socio-anthropologist and director of the Centre for Khmer Studies (CKS) in Cambodia, closed the two days of presentations and exchanges with a critical conclusion.
The training continued from Monday 21st to July 25th in the framework of thematic workshops at Duy Tan University.

The objective of workshop (1) “Economic, financial and logistical integration in ASEAN” is to take an in-depth look at the concepts developed by Thomas Vallée in the plenary sessions – “The challenges of regional integration and their assessment” – by taking an interest in the different facets of economic and financial integration: harmonisation of the regulation of financial markets, corporate governance, investor protection, geographical contours of a possible optimal monetary zone, integration of banking markets, liberalisation of logistical services, etc.

In the mid-1990s, exponential economic growth, fed by the consequent volumes of foreign direct investment and by the international movements of capital, contributed to the creation of major macroeconomic imbalances in several Southeast Asian countries. These imbalances were exacerbated by the fixed exchange rate regimes that characterised the countries of the region and reached their peak in 1997-1998. Although at the beginning, the crisis was perceived as a natural correction that only affected Thailand, it quickly spread to other Southeast Asian countries. The crisis marked a turning point in the evolution of economic relations between ASEAN countries; it re-launched an old debate about the strengthening of monetary and financial cooperation in the region.

The workshop was organised around three research axes:

- The first axis takes a look at the integration of financial markets, the principal regulations that govern the behaviour of players on the markets and standards as far as the corporate governance is concerned. The central idea is that enterprises play a crucial role in economic development and that corporate governance represents a key element that is likely to strengthen investors’ confidence and improve the efficiency and quality of development;
- The second axis focuses on the integration of banking markets and monetary cooperation in Southeast Asia;
- Finally, the last axis examines logistical development policy: the theoretical foundations of macro-logistics and regional chains of supply, and the liberalisation of logistical services as a prerequisite for the ASEAN Economic Community. Then, by using “geographical simulation” models as a basis, different possible development scenarios are addressed in order to predict the impact of ASEAN until 2030.

Representing a real system in all its complexity in order to measure its possible evolutions or to assess the impact of decisions in different scenarios is one the challenges of current research in computer modelling, particularly in agent-based modelling. This approach, which is complementary to classical analytical methods, allows us to conceive models whose dynamic is the result of interactions between the computerised representations of the entities in a modelled system (players, institutions, environment, etc.). These models are then used as a support for a “virtual” experimental method – requiring the use of simulations – where the resulting dynamics may be studied with all the necessary details and where interaction with the user is encouraged. This second workshop entitled “Epidemiological risks and integration of health policies on a regional scale: modelling to make better decisions” uses as a starting point a concrete and documented case study on a
regional scale in Southeast Asia concerning the spread of the dengue epidemic along the road linking Thailand, Laos and Việt Nam. The objectives are:

- To make the trainees think about the necessity and the means of harmonising public health policies to better fight against the epidemiological risks in spite of cultural differences in the approach to the disease in these three countries;
- To show how the conception of models, which couple realistic and spatially explicit simulations of risk with the decision-making models of the public players concerned (governments, provinces, local), allow us to explore different integration scenarios and compare them;
- To provide the conceptual tools and software necessary to generalise this approach for other case studies in which local choices concerning public health depend closely on the choices made by neighbouring countries.

The week was organised in two parts: in the first more academic part, the current challenges in terms of public health modelling and the tools and methodologies available to construct agent-based models from real data – geographical, economic, social and epidemiological – were presented. In the second, more practical, part, the trainees were divided into five working groups whose objective is to enrich the presented models by incorporating new data and new rules; the idea is to study different scenarios of coordinating the public authorities concerned by the case study. Each group was called upon to recapitulate the methodology presented during the first two days.

Workshop (3) "Development Corridors in ASEAN" aimed to analyse and measure their impact on the economic development and spatial organisation of territories. The particularly multidisciplinary dimension of this workshop allows us to cross-reference and confront different methodological approaches – geography, logistics, political economy and history. Five work stages were proposed.

- **Constructing a spatial analysis grid to study economic corridors.** Using a body of texts dealing with economic corridors in different regions of the world – Asia, South America, Africa and Central Europe – the trainees propose a spatial analysis grid to study the corridors. The results are compared with an analysis grid elaborated in the framework of the L’Agence Nationale de la Recherche (ANR)’s Dynamiques transnationales et recompositions territoriales (Transiter).

  Nathalie Fau presented and debated the question of the development of the existence (or not) of the structuring effects of transports on territories. She then compared the development plans of different players at different levels: the railway connectivity plan of the ADB and the competing projects elaborated by China of high-speed railway corridors; comparison between the ADB plans and those drawn up by different States in order to measure the efficiency of economic corridors. The work done in the workshop focused on the local impact of the corridors (border cities) and the development of a methodology to measure these impacts.

- **The logistical approach to corridors.** After having demonstrated a logistical typology of economic corridors Ruth Banomyong presented a methodology in order to measure their performance – cost, time and reliability – “Banomyong model”.

• The economic approach to corridors. Elsa Lafaye de Micheaux placed the role of transport infrastructures in the framework of the development economy where this question has been the subject of ambitious and structuring programmes for the countries involved. She returned to this debate in the history of thought since the 1950s and in Official Development Assistance before focusing her presentation on the authors, their theories and contemporary discussions.

• The historical and geopolitical approach to corridors. Firstly, Hugues Tertrais looked at the development of corridors over a long period. Conceptually, it is thus important to distinguish the history of the word “corridor”, which is quite recent, from that of the question of movement in their reality as well as what might have hampered them (wars).

Cities are often considered to be mainly responsible for climate change because the majority of greenhouse gas emissions are generated in urban areas – industrial production, transport, air-conditioning, etc. Furthermore, urban spaces are often more susceptible to the consequences of climate change because of their population densities. The objective of the fourth workshop “Cities and Climate” was to examine the links between cities and climate change from an academic and operational angle. The training course comprised eight sessions.

The first introductory session presented the current main trends of research and the variety of disciplinary approaches. The trainers then demonstrated the various networks and groups of initiatives aiming to strengthen the role of cities in international negotiations and improve the taking into account of climate in their public policies. The third and fourth sessions were based on the project concerning adaptation strategies of French territories at the neighbourhood level – “Adaptatio”. Following reflection about research questions and international labelling issues, the workshop took a look at methods for setting up operational projects for the integration of climate challenges in urban strategies. This entailed familiarising the trainees with the diverse possible methods, accessible financing – particularly from international cooperation agencies – and the types of tools and the technical assistance that may be mobilised. The two following sessions continued to examine these operational challenges through the study of territorial climate strategies. These practical cases allowed the trainees to reflect together on the different development stages, the implementation of a public climate policy and the efficiency challenges to be considered – a concrete example is based on the climate strategy of the city of Đà Nẵng. The eighth and last session proposed some practical exercises that allowed the trainees to apply the methodologies for the setting up of projects that were seen in sessions 3, 5 and 6. Using documents that present examples from ASEAN cities, the workshop was invited to formulate an institutional, environmental, climatic, and urban diagnostic and propose some recommendations to set up a project: reform of urban strategy, priority investments, type of technical cooperation to be mobilised, etc.
### Principal characteristics of the Thematic Workshops of the JTD 2015

<table>
<thead>
<tr>
<th>Workshops</th>
<th>Scales / level of analysis</th>
<th>Disciplines</th>
<th>Tools / methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Regional scale, financial markets, enterprises</td>
<td>Economics, finance, logistics</td>
<td>Statistical database, geographical simulation model, “Delphi” method, case studies</td>
</tr>
<tr>
<td>2.</td>
<td>Regional and national scale, corridor</td>
<td>Modelling, epidemiology, public health policy</td>
<td>GAMA modelling platform, game theory</td>
</tr>
<tr>
<td>3.</td>
<td>ASEAN, countries, regions, corridors, cities</td>
<td>Geography, logistics, history, political sciences</td>
<td>Spatial analysis grids, development plans, “Banomyong” model, comparative studies</td>
</tr>
<tr>
<td>4.</td>
<td>Cities, neighbourhoods, communities</td>
<td>Economic and political sciences, environment, geography, urban development</td>
<td>Database, case studies and comparative analyses</td>
</tr>
</tbody>
</table>

The four workshops were conceived to welcome participants from different disciplines, the priority being to allow all the trainees to mobilise, in the most open way as possible, approaches and tools. This willingness to confront perspectives from a multidisciplinary angle crystallised during the last day of feedback, Saturday 25th July. As is the tradition at the JTD, a certificate of participation signed by the GASS, AFD, the IRD, the EFEO and the University of Nantes was awarded to each trainee at the end of the session.

### Trainees’ profiles

Ninety-three candidates were selected – four of whom were auditors – for this ninth edition. The registration forms of the selected trainees allow us to draw the following profile:

- A majority of women: 67% of the trainees;
- A mature public: 16% between 20 and 25 years old, 34% between 26 and 30 years old, 26% between 31 and 35 years old, and 24% over 36 years old;
- A diversity of status and levels of education: master’s, master’s and lecturer, master’s and development practitioner, Ph.D. students, Ph.D./doctoral student and lecturer, researcher, researcher and lecturer, lecturer and development, development practitioner;
- A high level of multidisciplinarity: sociology, anthropology and socio-anthropology, economics, finance, statistics/mathematics, demography, public health, epidemiology, geography, history, political sciences, management, legal sciences, modelling, computer sciences;
A wide geographical diversity of candidates selected in Việt Nam, provinces of: Thái Nguyên, Hà Nội, Đà Nẵng, Huế, Kon Tum, Nha Trang, Quảng Bình, Quy Nhơn, Hồ Chí Minh City, Bình Dương, Cần Thơ;

Regional/international openness: Myanmar, Cambodia, Laos, Madagascar;

Auditors from Việt Nam: National University of Economics in Hà Nội, Kobe University (Japan), Campus numérique Francophone in Đà Nẵng, Vietnam German University, Consulate of Japan in Hồ Chí Minh City;

Institutional pluralism:

- Việt Nam: VASS training Institutes (Hà Nội, Central and southern Việt Nam), University of Hà Nội, École normale supérieure in Hà Nội, Polytechnic University of Hà Nội, National University of Education in Hà Nội, University of Water Resources, Southeast Asia Research Institute, Gender and Family Research Institute, Institute of Sociology, Institute of Anthropology, China Research Institute, Việt Nam National Satellite Centre, Thái Nguyên University of Economics and Management, University of Đà Nẵng, Đà Nẵng University of Economy, Campus numérique Francophone of Đà Nẵng, Institute of Research for Socio-Economic Development, Huế University of Sciences, Central Institute of Scientific Research, Campus of the University of Đà Nẵng in Kon Tum, Educational College of Nha Trang, Hồ Chí Minh City Open University, Higher School of Foreign Trade of Hồ Chí Minh City, Hồ Chí Minh City University of Economics, Thủ Dầu Một University, Hồ Chí Minh City University of Agriculture and Forestry, Hồ Chí Minh City University of Human and Social Sciences, Institute of Development Research, Vietnam German University, University of Cần Thơ;
- Myanmar: University of Foreign Languages, Chamber of Commerce, Ministry of Planning;
- Cambodia: Royal University of Law and Economic Sciences, University Jean Moulin Lyon 3, BNG Legal – law firm, Office of the Council of Ministers;
- Laos: National University of Laos; Ministry of Justice;

Finally, at the time of writing, we are delighted to announce the signing of a new cooperation agreement that associates our long-standing partners to the Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD) for the 2016-2018 period.

The tenth edition of the JTD will be held for the second consecutive year at the University Duy Tân in Đà Nẵng (Central Việt Nam) and will deal with the topic of “Social and Economic Challenges of the Energy Transition in Việt Nam and in Southeast Asia”.

Stéphane Lagrée
Head of the Cellule de Coopération Francophone
GASS-VASS
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The institutional synergy that was sealed by a partnership agreement in 2010 has given “Tam Đảo Days” a regional influence in Southeast Asia and beyond. We should like to thank the training Institute at the Việt Nam Academy of Social Sciences (GASS-ASSV), Agence Française de Développement (AFD) – Studies, Research and Knowledge Department, Global Development Network (GDN), the École française d’Extréme-Orient (EFEO), the Institut de recherche pour le développement (IRD) – direction des Programmes de recherche et de la formation au Sud, the University of Nantes, the Agence universitaire de la francophonie (AUF) as well as the French embassy in Myanmar.

This publication owes a great deal to the recommendations of Guillaume de Saint Phalle, and it is important for us here to thank the AFD’s Knowledge Management and Dissemination Division for the high quality of our exchanges.

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Prof. Dr. ĐÔ Hoài Nam

Chairman of the Board of the Social Sciences Training Institute
Map 1. Localisation

Source: Tomorrow Media.
Part 1. Plenary Sessions
The words “region” and “regional” have several meanings in the French language and may be used at several levels (local, international), let me specify at the outset that we shall exclude the first level: the “regional construction” presented in this article is situated at an international level and the region is understood to be a group of neighbouring countries constituting, in this particular case, the Association of Southeast Asian Nations whose English abbreviation “ASEAN” has been adopted both in the region and throughout the world. However, does occupying the space between India, China, and also Australia, suffice to exist other than on the map? We must assume not, given the joint efforts of the member countries to constitute the “ASEAN Community” that was promised for 2015 – we are already there, and at this moment, which is intended to be historic, we must take stock and make a situational analysis. To understand fully how we arrived here, a geopolitical analysis will be then necessary. The current challenges and issues will thus become apparent.

1.1.1. An Historical Moment

Is the aim of forming an “ASEAN Community” in 2015, which must be officially formalised on 31st December, at a moment when the “regional” Association will soon be 50 years old, anything more than a slogan? ASEAN, which was founded in Bangkok in 1967 by five neighbouring countries (Thailand, Malaysia, Singapore, Indonesia and the Philippines), now groups together twice as many (with Brunei and the countries of Indochina: Việt Nam, Laos, Cambodia, Myanmar); these ten countries are scattered over an area equivalent to that of Europe, and although its economic weight is a lot less than the latter, its population is almost equivalent with about 600 million habitants.

The term Union has not yet been used for the moment and, the level of integration in Southeast Asia indeed appears to be far lower than in Europe. Among the several existing regional institutions, a general Secretariat has been nonetheless functioning since 1976: situated in Jakarta, the Indonesian capital, it is currently managed by a Vietnamese Secretary-General, Lê Lương Minh. The legitimacy of Indonesia to host such an institution has not been challenged: a founding member of the Association in 1967, we know it is also the largest State. Việt Nam, for its part, symbolises its
extension in the 1990s (1995 to be exact). The other important ASEAN institution, with its annually rotating presidency, also mixes the “generations”: Myanmar (or Burma) held this responsibility for the first time in 2014 – a member country since 1997, it “missed” its turn in 2006; Malaysia, one of the founding countries, is presiding in 2015, and will host in April, for the third time, on the island of Langkawi, the Association’s Summit. Laos, one of the latest wave of adherents (1997), will take over for the second time in 2016 – after that, in 2017, it will be the turn of the Philippines.

There are many examples of regional vitality, including sporting events. Thus, when Singapore hosted the 28th Southeast Asian Games (SEA Games) in 2015, it was honouring a tradition that is older than ASEAN itself: indeed, Bangkok organised the first games in December 1959, some eight years before the founding Bangkok Declaration. 457 athletes from six countries (Thailand, Malaysia, Myanmar, South Viet Nam, Cambodia and Laos) competed in twelve sports. They were initially called the Southeast Asian Peninsular Games, and in 1975 they were broadened to include the Philippines and Indonesia to become simply the Southeast Asian Games. In Singapore in 2015, 4,370 participants from 11 countries (the ten ASEAN countries and Timor-Leste) competed in 36 different sports and more than 400 events; nearly ten times more than in 1959.

What might change the institution of an ASEAN Community on 31st December 2015? The idea seems to be to strengthen ties, coordinate the regulatory and economic action of each member country to bring together neighbouring economies – which often have big discrepancies between each other – and attempt a greater mutual opening-up. More than a decisive change, it is a step forward, in which the ASEAN “Ten” commit themselves, between themselves and in the eyes of the world, to the principles and future prospects of the regional association: “The leaders of ASEAN have committed themselves to promoting strong and sustainable economic growth, encouraging trade, investment and job creation, as well as speeding up negotiations about a single market based on trade agreements and the removal of customs barriers”, emphasises the 22nd November 2015 Declaration. ASEAN thus progresses by setting successive goals, and the attainment of each one strengthens overall cohesion. The Ten are already part of a new ten-year outlook, and the “vision of the ASEAN Community for 2025” has itself three dimensions: politics and security first, also economics of course (towards a “single market”) and finally socio-cultural. Already in 2015, a first declaration in Kuala Lumpur expressed the common willingness to “reaffirm the necessity of forming a united people while at the same time conserving the specificities of each one”.

The institution of an ASEAN Economic Community in 2015 – explicitly refers, through the use of this qualifier, to the early 1990s, but it also follows other initiatives that, each in turn, have also served to tighten the links between the member countries. In the same spirit, an ASEAN Charter was also adopted at the Singapore Summit, in November 2007, which, without going so far as to lay the foundations of a new regional State, reminded the Ten of the guiding principles of their collective functioning: cooperation, territorial integrity, regional peace, and also instituted two annual summits. The preceding stage, at the Chiang Mai (Thailand) Summit in May 2000 indeed celebrated the successful widening of ASEAN to ten member countries, but it also had to deal with the financial crisis that had shaken the region in 1997-1998. At the beginning of the preceding decade, the 1992 Singapore Treaty – to which the 2015 term “Economic Community” explicitly refers – had thus laid the foundations of the ASEAN we know today, whereas the widening of the Association was
still only a project: among other schemes, the Asian Free Trade Area (AFTA) was then formed that henceforth linked the region with the same economic regulations.

1.1.2. A Geopolitical Reality

There was indeed a before and after 1990. The important events of 1989-1991 did indeed have a global, century-scale impact: the domino-style collapse of European communist countries, then the USSR itself, while the communist regimes in China, in Việt Nam and in North Korea remained in place. Before 1990, Southeast Asia was trying to assert itself in a region that was dominated by the Cold war and the Việt Nam war tensions. After 1990 the ASEAN we know today functioned to some degree and was about to regroup ten member countries seeking to find a place in the new international power relations.

ASEAN's First Steps

ASEAN was gradually built in the 25 years that preceded this major turning point. The context of the emergence of this Southeast Asian “region” was first of all strategic and part of the Cold War. On the map, its second front – the first already dividing Europe – opened in the Asia Pacific in 1950 with the start of the Korean War. A year earlier the communist party had triumphed in China, when Mao Zedong had proclaimed the People’s Republic on 1st October 1949. Further to the south, in Southeast Asia precisely, these circumstances radicalised the Indochinese War, which had pitted against each other since 1945 the French expeditionary corps and a resistance movement inspired by communist and national resistance, henceforth supported by China. The involvement of the United States in 1950, which had just defeated Japan five years earlier, was to bring together all these fronts. Indeed, on 27th June 1950, 48 hours after North Korean troops had crossed the 38th parallel, Harry Truman, the United States President, called upon the United Nations (UN) and promised American aid to the countries on the front line: he then traced a north-south line almost equivalent to the European “iron curtain” – separating in this case the communist side to the West and all the mostly insular countries to the East that were supported by the USA – Japan, South Korea, Taiwan and the Philippines.

In the 1950s, Southeast Asia appeared to be less clearly divided: after the Geneva Conference, which had ended the first Indochinese conflict (July 1954), the Democratic Republic of Việt Nam (DRVN) was founded to the north of 17th parallel; and after the Manila Conference, which founded the Southeast Asian Treaty Organisation (SEATO, September 1954), Thailand and the Philippines and also Pakistan relied on their American alliance. On the other hand, Indonesia affirmed its neutrality and organised at Bandung the conference of newly independent Asian and African countries (April 1955). The tensions and the war that began again in South Việt Nam at the beginning of the 1960s were to progressively radicalise the situation.
Map 2. The Cold War’s Asian Front

Source: archive.org/web/
Nobody was yet quite sure about what exactly Southeast Asia signified. Its perimeter was associated with the concept of underdevelopment and corresponded to the contours of southern Asia: in the 1950s Tibor Mende wrote about a *Southeast Asia between two worlds* (Mende, 1955) by using as examples the cases of Indonesia, Myanmar and, like SEATO, Pakistan – a decolonised and indeed poverty-stricken Asia; in 1971, Gunnar Myrdal stigmatised (using a study from the 1960s) an *Asian Drama* that affected an area from India to the Philippines (Myrdal, 1973). However, the region itself soon became synonymous with war. The Việt Nam War, through its violence and length – the most intense fighting lasting seven years (1965-1972) – created turmoil throughout the region. The United States, whose “domino theory” was the guiding principle of its action, intended to block communist expansion in South Việt nam and they used all their means to do so, burying the North under a deluge of bombs and deploying more than 500,000 men to the South. The doggedness of the People’s Army of Việt Nam and help from the communist “side”, which matched the American commitment, stretched out the conflict.

It was at the height of this war, after several attempts, that ASEAN was formed on 8th August 1967: the five countries that signed the founding Bangkok Declaration (Thailand, Malaysia, Singapore, Indonesia and the Philippines) formed a circular arc to the south of war-torn Indochina, as if to guard themselves against the possible contagion of the communist “threat”. The evolution of the war proved them right: on the periphery of the Vietnamese “quagmire”, the neighbouring countries – Laos and then Cambodia – were progressively drawn into the conflict that resulted in a United States withdrawal and the installation of communist regimes in the three countries of Indochina (1975): Myanmar apart, the whole region was this time divided into two factions, communists and their adversaries, “Red” Indochina and ASEAN. What had only been an “intention”, to quote the words of François Joyaux, became an alliance (Joyaux, 1997).

Although somewhat shaken, ASEAN adapted itself and gained strength. At their first Summit in Bali (Indonesia) in February 1976, the ASEAN “Five” adopted the first fundamental texts of their association: a declaration of agreement and a treaty that is still in force today, which is signed by each new adhering State. At the same time, the old distinction between mainland or continental Southeast Asia and island or archipelagic Southeast Asia faded.

Thus, the SEA Games, whose organisation had until then been mainland (Myanmar, Thailand, Malaysia, Singapore, Laos, Cambodia, South Việt Nam), modified the repartition of its member countries after 1975: in the Regional Games organised in December 1975 in Bangkok, Laos, Cambodia and South Việt Nam were absent; in the following Games in November 1977 in Kuala Lumpur, Brunei, Indonesia and the Philippines took their places. Behind Thailand, it was these countries that stood up to Việt Nam in the 1980s after it intervened in Cambodia to chase the “Khmer Rouge” from power and maintained troops there for a decade. However, it was necessary to wait twenty years for the ten current members of ASEAN to all compete together in the 1995 Games in Chiang Mai (Thailand).

In the meanwhile, there was a big change in the 1970s, which witnessed both the end of the Indochinese wars and the appearance of economic growth on the Pacific coastline. Southeast Asia reinvented itself under the label of growth, with the World Bank finally remarking an “Asian miracle” in 1993: a north-south axis of growth then replaced the diagonal of poverty of South Asia. The institutional construction of ASEAN took place at the same time: in the 1990s, the ten member
countries of the association gave a political reality to what had been until then a geographical area. Southeast Asia appeared to finally exist as such, mixing growth and underdevelopment, and even transcending them with a regional project. The “ASEAN Community” now became possible.

**ASEAN Today**

It is not easy to find the trace of the first “ASEAN” in the landscape of today’s bustling life. The countries of Southeast Asia found a common destiny, around the “regional” idea, throughout the long period of conflicts that marked the second half of the 20th century in this part of Asia, at a moment when the Cold War and the Việt Nam war tensions cumulated their effects. In these conditions, the turn of the 1990s, marked by the collapse of the USSR, the “mother-country” of international communism, was a key moment.

The ASEAN we know today inherited much from the early 1990s: in the history of ASEAN, there is a before and after 1990, each lasting the same period of time, a quarter of a century each. The change in 1990 signified, we already know, the end of a bipolar world, which has been retrospectively referred to as a long Cold War. On a regional scale, the conflicts were also resolved and ASEAN was launched with a new outlook: around the beginning of the 1990s, the issue of Cambodia, which had so much divided the region, was resolved by the Vietnamese withdrawal from the country (1989) and by the Paris Agreement regarding the two principal national players, Norodom Sihanouk and Hun Sen (1991). The Singapore Treaty (1992) reshaped somewhat the regional association, while in Europe, the Maastricht Treaty re-launched European construction at the same moment.

The general trend after the collapse of the USSR and the end of bipolarisation, which had structured the planet, was the “regional” regrouping around existing economic poles: the European Union (EU) widened and restructured itself with the euro, the single currency, and gained new impetus; North America established a vast common market (NAFTA – Canada, United States, Mexico); Mercosur was established in Latin America, etc. Asia, which was still powered by Japan, remained the only big economic zone that was somewhat “disorganised”, in spite of the emergence of the South. ASEAN, however, appeared the ideal candidate, even though, unlike the EU, its perimeter did not coincide with the heart of regional dynamism, which was itself constituted by a “growth axis” that ran along Asia’s Pacific coastline - from the Korean Strait to those of Singapore, via Taiwan and Hong Kong. (cf. map 3)

Singapore, the city-state that largely dominates the region economically, took the initiative: the Treaty of Singapore, which was signed in 1992 by the ASEAN Six – the Five founding members plus Brunei, which gained independence in 1984 and joined ASEAN the same year – gave new life to the regional organisation. It first gave itself a new economic dimension with AFTA and the eventual creation of a free-exchange area. As a non-military organisation, one year later it acquired a security “Forum” (ARF: Asian Regional Forum) with a regional vocation. At the outset it grouped together the countries committed to the Western side and then began discrete talks with the countries of the region, poorer and often communist, in order to integrate them into the regional organisation. The 1990s also saw ASEAN widen its scope to include Thailand’s Indochinese neighbours: Việt Nam (1995), Laos and Myanmar (1997), and finally Cambodia (1999). This new style ASEAN concentrates the big issues on the horizon in the 21st century and the new regional challenges.
Map 3. Asia Pacific Coastline’s Growth Axis

1.1.3. Challenges and Issues

The resilience of ASEAN to geopolitical changes, and particularly to the end of the Cold War and the bipolar world, is without doubt linked to these very objectives. The declaration signed in Bangkok in 1967, which founded the Association, remains explicit: at the top of its goals and objectives, before even the “promotion of peace”, which is relegated to second position, is the necessity of “accelerating economic growth, social progress and cultural development in the region”. The term “Third World” and all it encompasses, which had been coined 15 years earlier (1952) by the French demographer Alfred Sauvy, then characterised the ASEAN Five, even though Singapore had begun its journey to economic success: a largely rural population, high demographic growth, poverty, etc.

Unequal Growth

Ever since, as is shown in the statistics concerning progress since the 1980s, the general trend has indeed been growth, even though most of the countries in the region still have low rates. If we intersect, for each country considered, at three successive moments (1990, 2000, 2010), the average annual growth of its gross domestic product (GDP) – for the corresponding decades – and the gross national product (GNP) per capita, taken at the end of each decade, we obtain a dynamic representation. Each country is thus represented by three points illustrating its progress: in order to rise in the “growth elevator”, China sets the example, with a high growth rate, but with the burden of a large population mass – in contrast, Singapore, whose growth was for a long time spectacular, but without this demographic handicap, culminates with the highest peaks. However, there are no low growth rates.

The contrasts remain sharp, even spectacular. Growth indeed appears to be very unevenly spread in the region, both because of demographic imbalances and geopolitical factors. The contrast between China and Singapore is particularly evident in the Malay world: Indonesia with a demographic mass of 250 million inhabitants, and the Philippines, which now has over 100 million, have difficulty making their populations benefit from their economic growth; in contrast, Malaysia, which is less densely populated, registers economic performances that place it at the top of the wealth distribution scale. A geopolitical factor contributes to this phenomenon: the emergence around the Malacca Strait, as well the maritime routes that lead to the growth reserves of Northeast Asia, of a “median” Southeast Asia where wealth and growth are concentrated – more specifically in Singapore, Brunei and Malaysia. The economic dynamic, more particularly commercial and financial, established itself there and is prospering, particularly around the port of Singapore, one of the biggest in the world, and one of the region’s three “sovereign wealth funds”, in Singapore and Brunei. The highest GDP rates per capita, which rival those of the world’s leading economies, are also found there.

The 1967 Bangkok Declaration did not state it, but the fortune of the two small and extremely rich States of Brunei and Singapore suggest it: the conditions for development are to be found in the energy and transport sectors.
Graph 1. Growth Elevator

Energy and Transport

As far as energy is concerned, Southeast Asia firstly has its own hydrocarbon resources – petrol and natural gas – but other energy resources pass through the region. Southeast Asia is indeed not the Persian Gulf, even though one of the world’s biggest companies, Shell, was established at the beginning of the 20th century (1906) in Indonesian waters. Several countries in the region are “producers”, but they are average ranking producers and do not seem to have considerable reserves at their disposal. These resources are, as is usually the case today, off shore: the areas of exploration or exploitation run along the coasts (of Việt Nam, northern Borneo or southern Philippines) or they are established in the big maritime spaces, which are both wide and quite closed-off (south of the South China Sea, Gulf of Thailand, Java Sea, etc.), where the sea is not deep. From Thailand to Indonesia, natural gas plays the leading role and is notably exported in liquid form towards Northeast Asia.

In national reasoning, hydrocarbons contribute to anchoring development, more particularly their refining, which is the possible starting point for a whole chain of production: from Singapore, which has a cutting edge petro-chemical sector, to Việt Nam, where the Dung Quất refinery, commissioned in 2009, in the central province of Quảng Ngãi, is breaking new ground, the issue is the same.

At a more regional level, more substantial masses of hydrocarbons from the Gulf and Africa cross though the region to Northeast Asia, passing notably through the Malacca and Singapore Straits. This latter port site is historically linked to this circulation: Singapore is, at the same time, a huge “filling station” for ships, as well as a distributor for a good part of the region while conserving, it is said, certain quantities for its cutting-edge petrochemical sector, it also oversees the passage of hundreds of millions of tonnes destined for Japan, South Korea and China.

The response to the “electricity” challenge appears necessarily more regional, at least in the peninsular part of Southeast Asia. Indeed, the region has, with the Mekong basin, a powerful river system that flows over some 4,500 km, crossing through six countries (China included), which has great potential, in terms of transport, water management for agriculture, and energy. In the context of decolonisation, the first initiative came from the UN in 1957, which drew a perimeter grouping together four countries through which it flows (Thailand, Laos, Cambodia, and South Việt Nam in order to coordinate economic, and thus development, initiatives. However, in the 1960s, the restarting of war in Việt Nam and the surrounding countries was not conducive to maintaining the conditions necessary for such an enterprise. It was thus necessary to wait another 40 years for this bloody conflict to end (1975) and the tensions it caused – around Cambodia and with China – to die down. The adherence of Việt Nam in the ASEAN regional organisation (1995) concretised the new situation. Pushed this time by the Asian Development Bank, whose headquarters is in Manila, the implementation of a new regional perimeter around the Mekong River basin, the Greater Mekong Sub region (GMS) – 1995 – extended to include Myanmar and China, created – also in 1995 – sustainable conditions for it.
Watchword: “Connectivity”

The GMS brought us back to development basics: energy and transport. For the first element, energy, the old programme of the 1950s and 1960s is being re-implemented and improved. More than 20 hydroelectric dams are in the process of being constructed or investigated south of China, in Laos, on the Laos-Thailand border, and also in Cambodia. Diplomatic and/or environmental matters are indeed complicating the programme: upstream dams, notably when they block tributaries, are suspected of modifying the river flow and, for those built “run-of-river”, the sharing of resources is naturally a source of tensions. Laos, because of the place it occupies at the heart of the Mekong basin, can bear witness to this and may even be described as a prime player: the powerful Nam Theun reservoir-dam, built on a tributary, was commissioned in 2010 and a consensus was eventually found in 2012, notably with Thailand, for the dam at Sayabouri, upstream of the Mekong river.

The remainder, thus notably roads and circulation, may be included in the concept of “development corridor” and the hopes it inspires. The concept is schematic: on the map, the development corridors represent axes – axes, or corridors – that trace potential development dynamics. Thus, the following corridors were traced: a “North-South economic corridor” linking Kunming to Bangkok, China’s Yunnan to the most dynamic metropolis of the Indochinese peninsula presently; two other corridors are connected to Việt Nam, one between Kunming and Hà Nội, the other between Bangkok and Hồ Chí Minh City via Phnom Penh, the Cambodian capital. In all cases, they are axes that have yet to be materialised by roads and railway lines, before making possible the development of economic activities, such as refineries and other places for the transformation of hydrocarbons, the transport axes – rail or road – are likely, at the same time, to fix production and develop trade. The rapid progress of Myanmar and the dynamism of Kunming at a regional level have resulted in the emergence of a Sino-Burmese development axis linking notably Kunming to the port of Kyaukpyu (Myanmar).

These projects, which are likely to overcome the “balkanisation” inherited from the war years that still characterise the peninsula, are in turn broken down in the concept of “connectivity” that is being promoted by ASEAN. The other Southeast Asia, island and archipelagic (Indonesia and the Philippines) will not be able to escape this. The constraint here is the insularity and under-equipped state of the archipelagos as far as transport infrastructures are concerned: the cost of logistics is infinitely higher than that of maritime transport, and transport between the islands, over quite short distances, is automatically more expensive than between Jakarta and the big Chinese ports, which are, however, further away; Indonesia is putting forward its own concept – the Sea Highway – to advance in this direction.

The Future of ASEAN

Does ASEAN, as a regional organisation, have the means to solve all these issues? The association, which is no more a State than is the EU, but is, however, more integrated and even supranational, would have the authority to resolve all these problems. This particularly concerns environmental matters, which follow dominant trends such as climate change, or accidental ones: the latter, the tsunami (2004), like the volcanic eruptions on the islands of Lucon or Java may, however, benefit
from regional prevention measures – at least this question is being raised; the bringing under control of Indonesian forest fires, whose smoke affects several countries in the region, is more problematic. The constraint appears identical as far as “security” is concerned, in spite of the annual Forum that bears the same name. The maritime borders of the region, particularly the South China Sea, which are a source of real tension, both in the region and at a wider international level, do not appear to find a solution in the regional framework.

However, ASEAN remains the only “regional association” in the Asia Pacific: it groups together, as we already know, ten States and more than 600 million inhabitants, whereas China itself, the biggest and most populated of the Asian countries, has twice as many inhabitants. The geopolitical balance of Asia depends notably on its capacity to develop and on the relations it is capable of having with other entities in the area. Ever since the beginning of the 1990s, there have been many attempts to organise a sort of regional bloc, which would go beyond the limits of ASEAN: the East Asian Economic Caucus (EAEC), proposed by Mahathir, the Malaysian Prime Minister, in 1991, in order to group together the strictly Asian and non-communist countries of the zone, failed to materialise; at the same time, ASEAN (at the outset the original Five plus Brunei) was widened between 1995 and 1999 to include four new member States, thus equating the organisation and the geographical region. Outside Southeast Asia, the 1997-1998 economic crisis, led to the envisioning of a widened perimeter: ASEAN+3 (China, Japan and South Korea), the idea, which came from Seoul, suggested that the “small countries”, in this case South Korea, are the most interested in regional construction. But in no way does ASEAN+3 constitute a regional “organisation”, but rather the recognition of ASEAN’s principal dialogue partners, those which are particularly interested in what it will become, for strategic reasons (China), or because they are the principal destinations of their foreign investment, and even their outsourcing (Korea, Japan).

At the same time, wider regroupings occurred, which are not based on the regional Association, but group together the States on a planetary scale. The Asia-Pacific Economic Cooperation (APEC), an Australian initiative (1989) that was re-launched at the Seattle Summit (1993) by the United States, brings together at annual summits all the countries of the Pacific basin – including Southeast Asian countries. Since 1996, the Asia-Europe Meeting (ASEM) does likewise biannual summits, even though the regular increase in the number of stakeholders somewhat clouds its visibility. There remains a trend toward both regionalisation and free trade in the zone that is particularly encouraged by the United States: a Trans-Pacific Partnership (TPP), negotiated since 2008 between the United States and – without China – eleven partners (Canada, Mexico, Chili, Peru, Japan, Malaysia, Việt Nam, Singapore, Brunei, Australia, New-Zealand) was first concluded in the form of a treaty signed on 5th October 2015 in Atlanta, but which has not yet been ratified.

Regional construction in Southeast Asia will soon be 50 years old. The Association of Southeast Asia Nations has not changed name since then. While its creation was connected to Cold War issues, it survived the end of the blocs and the beginning of the 1990s, and even gained greater impetus from this period. It almost doubled its volume by integrating poor and sometimes communist countries of the Indochinese Peninsula and gained economic substance through the dynamics of free trade. It has now become a player in the international life of Asia, it moves forward through the setting of objectives, and has just gone one step further by attaining the goal it had set itself for
2015. In 2025, towards which it is now geared, we will be able to say whether it has consolidated its economy, whether it has asserted its relative weight and whether it counts even more as an international player. Asia is without doubt the part of the world that is undergoing the deepest transformations and, by grouping together countries that were, for a long time, renowned for their underdevelopment, it appears – at least in its eastern part – to have escaped from the Third World. Southeast Asia, to some extent, sums this all up and seems to have achieved a certain unity, even though its complete integration is contestable. Tensions remain between national construction – recent and which only aspires to assert itself – and regional construction. The future belongs without doubt to the accommodations that will be found between the two, which will determine whether ASEAN really becomes the regional player it aspires to be.

References


1.2. The Challenges of Regional Integration and their Assessment

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The challenges linked to the economic and political "regional integration" of Southeast Asian countries are multiple and depend greatly on the level of integration desired. Regional integration is defined as a movement towards the economic, political and even social convergence of different countries. Some examples of regional integrations, the European Union, the Common Market of the South (Mercosur), the North American Free Trade Agreement (NAFTA), Asia-Pacific Economic Cooperation (APEC), etc., show us that such integration is the fruit of a long process that develops in successive stages. The Association of Southeast Asian Nations (ASEAN) is no exception to this rule. Although the idea first began in 1967 with five countries (Indonesia, Malaysia, Philippines, Singapore and Thailand), it only led to the constitution of first regional integration – in the sense of a willingness to have economic cooperation defined by the principle of the creation of a free trade zone – in 1999 with the creation of the ASEAN Free Trade Area (AFTA) and the addition of Brunei as a member of the zone. In 1999, following the adhesion of Việt Nam (1995), Laos and Myanmar (1997) and Cambodia (1999), ASEAN then grouped together almost all Southeast Asian countries. Finally, in 2002, the ASEAN Economic Community (AEC) project was launched with the view to an official launch on 31st December 2015.

In order to get a better grasp of the challenges as well as the progress – or not – of this regional integration, we propose to first discuss the different levels of regional integration by specifying their advantages and disadvantages. In the second part, we shall consider the possibility – or not – of a monetary union for ASEAN. Finally, we shall end this presentation by looking at some of the indicators that allow us to measure the impact of these integrations.
1.2.1. Regional Integration: Advantages and Disadvantages

Subsequent to the work of the economist Balassa (1961), there are traditionally five different levels of regional integration, at the political, monetary and economic level, with the characteristic that each upper level includes the lower level while adding new elements – the “Russian doll” model.

This table charts the different levels of integration with the principal characteristics associated with them as well as the main difficulty.

### Table 1. Characteristics and Difficulties of the Different Levels of Regional Integration

<table>
<thead>
<tr>
<th>Level</th>
<th>Name</th>
<th>Principal characteristic(s)</th>
<th>Principal difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Free trade area (FTA)</td>
<td>No customs tariffs between member States</td>
<td>Circumvention of customs tariffs</td>
</tr>
<tr>
<td>2</td>
<td>Customs union (CU)</td>
<td>FTA+ common policy concerning customs tariffs with non-member countries</td>
<td>Deflection of traffic versus creation</td>
</tr>
<tr>
<td>3</td>
<td>Common Market (CM)</td>
<td>CU+ freedom of movement of factors of production (labour, capital))</td>
<td>Economic convergence versus destabilisation</td>
</tr>
<tr>
<td>4</td>
<td>Economic and Monetary Union (EMU)</td>
<td>CM+ economic and monetary union</td>
<td>Symmetric shocks versus asymmetric shocks</td>
</tr>
<tr>
<td>5</td>
<td>Political union (PU)</td>
<td>EMU+ coordination of policies, including social ones</td>
<td>Abandon of national sovereignty</td>
</tr>
</tbody>
</table>

*Source: Author’s construction.*

### FTA and Rule of Origin

In 1992, the Free Trade Area (FTA) AFTA was created. It concerns the ten member countries of ASEAN. Just like any other FTA, it is characterised by the elimination of customs duties as well as by quantitative restrictions on imports between the ten member countries of the zone. However, each country keeps its own trade policy with non-member countries. The economic consequences of such integration are the following:

- It allows the improvement of intra-zone competition;
- The theory of international trade tells us that each country should specialise in function of its comparative advantages (*i.e.* in the production of what it is best at, compared to other productions);
- This competition with specialisation must allow the growth of economic development in the countries in the area.
The Challenges of Regional Integration and their Assessment

There remains, however, a big difficulty in the implementation of this FTA: the existence of a tariff circumvention strategy by non-member countries. If France were to export its products to Việt Nam and be subject to a de facto 30% ad valorem custom tariff, it might prefer to send its products to Thailand, where it would only pay 10%, and from there re-export them to Việt Nam via 0% customs duties. Of course, this would increase certain transaction costs – such as transport costs – but would be compensated by a duty of 10% instead of 30%.

**Diagram 1. Example of Tariff Circumvention**

![Diagram](image)

*Source: Author's construction.*

This strategy that aims at using the cheapest gateway in the area can only be thwarted if criteria exist that allow us to determine to what extent a good is really produced in a member country, in order to have the right to be imported to another member country with a 0% customs tariff. These criteria are referred to as "rules of origin". Determining the origin of an imported product is important insomuch as customs tariffs and other possible restrictions depend on this provenance. There is a relative diversity in government practice concerning rules of origin. One of the most widely used criteria is that of substantial transformation, which indicates that a minimal percentage of the added value must have been carried out in the country in question. However, this rule raises a significant economic problem: How can we calculate the percentage while at the same time taking into account the specificities of certain emerging countries?

- One well-known example concerns the impossibility for Lesotho to have its clothing production recognised as a national production because of too strict an application of these rules within the EU. As Lesotho has neither the capability to produce the machines necessary for this production, nor the capacity to make the raw cloth – and given the low remuneration for the "work" carried out through its adding of economic value within this international division – it could not claim
the creation of sufficient added value to have the national origin of its production recognised. Therefore, it could not benefit from the preferential customs tariffs specified in the framework of the Lomé Agreements. The AEC rules of origin take this problem into account by including “Outward Processing” rules that allow the inclusion of goods that are not totally produced in the country, but whose production is part of a regional division of the production process.

Singapore is one of the countries the most affected by the implementation of this rule. Manufacturing activities are traditionally localised in low-cost producing countries like Việt Nam, whereas engineering, research and development services, as well as the final phases of production are often carried out in the city-state. Without the recognition of an Outward Processing rule, a large part of Singaporean exports would not benefit from the liberalisations negotiated in the framework of the free trade agreements (Lacour, 2014).

**Customs Union**

A Customs Union is a free trade area in which a common trade policy has been defined with regard to non-member countries. This concerns notably the definition of common external tariffs and the possibility of the redistribution of customs revenues between the member countries.

Two consequences may arise following the implementation of such a customs union. The first possible – positive – consequence corresponds to the creation of trade. That is to say the appearance of a flow of trade, which did not exist at the outset, from a non-member country, and this in the sense of the natural specialisation with regard to the price competitiveness of the country. The second possible consequence – deemed negative – corresponds to trade deflection, that is to say the replacement of a trade flow from a non-member country by a trade flow from a member country. If the member country was not initially the most competitive, then this deflection runs “contrary” to economic efficiency, in the sense of Ricardo’s theory concerning comparative advantages.

If creating them outweighs deflection, then the implementation of the customs union benefits from world trade. As far as the European Union is concerned, empirical tests show that this has been the case.

**The Common Market**

The common market – a single market – is the extension of a customs union that aims to implement not only the free circulation of goods and services, but also production factors (labour, capital). In the framework of the AEC, only certain categories of qualified workers will be allowed to circulate. The example of the controversy surrounding the “Polish plumber” in France\(^1\) shows the difficulty of achieving the real free circulation of workers, notably for short and medium-term assignments. In reality, mobility remains low. Indeed, in 2012, only 2% of the population within the EU resided in a country that was not the country of which they are citizen. Furthermore, this circulation is faced with the problem linked to the recognition of qualifications, and therefore of diplomas, between member countries.

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countries. The free circulation of financial and logistic services involves, for its part, a harmonisation of structures and financial rules, as well as increased connectivity between member countries.

The theoretical challenges of a single market are big. At a microeconomic level, it means building a vast market that offers more opportunities and a fall in prices for the consumer – as a result of greater competition. At the macroeconomic level, there is the promise of stronger growth, job creation and the improvement of external and budgetary balances. The negative consequences are evident: loss of protected markets, loss of jobs linked to either a lack of competitiveness or the wish to restructure and operate economies of scale. Finally, interdependence is, by definition, increased.

A single market could not exist, whatever its form, without the creation of a real policy of competitiveness – notably controlling public aid and concentrations. The positive scenario allows us to hope for a reduction in the imbalances between member countries and therefore a shift towards the convergence of standards of living driven by strong regional growth. The negative scenario is, on the contrary, based on the exacerbation of these imbalances, with a possible flight of capital and qualified workers towards the more advanced countries. European structural funds have been created in order to avoid such a scenario.

Finally, the single market may be completed by the implementation of a common economic (fiscal) and monetary policy. The principal advantages of monetary union are the fall in transaction costs linked to the changes and the promise of a generalised easing of interest rates. The major disadvantage is the loss of monetary sovereignty and the impossibility of using exchange rates as an instrument of economic policy. The last stage of integration corresponds to political union in which not only economic policies will be common, but also social, foreign and defence policies.

1.2.2. ASEAN-EC towards a Monetary Union: Lessons to be Learned from the EU

AFTA: Situational Analysis

The AFTA, like any creation of an FTA, had the ambition of greatly reducing, even totally, for a list of given goods, the trade barriers between countries. After several decades of implementation, the average tariff rate of ASEAN countries had been significantly reduced. The creation in 1992 of a list of products to benefit from a common effective preferential tariff (CEPT) resulted in a big step forward towards the removal of tariff barriers. This movement was strengthened by the adoption in 2003 of a protocol aiming to eliminate import duty. Currently, more than 99% of the products on the list of products included in the CEPT (inclusion list [IL]) of the ASEAN-6 have had their custom tariffs reduced to a Common Effective Preferential Tariff of between 0 and 5%, for a given list of products, was scheduled for all goods coming from ASEAN+6, with an exemption regime put in place for the last four countries to join ASEAN in terms of the delay in implementation.

ASEAN+6: Brunei Darussalam, Indonesia, Malaysia, the Philippines, Singapore, Thailand.
duty reduced to between 0 and 5%. The CLMV countries are not far behind in the implementation of their commitments with 66% of their products between 0 and 5%.\[4\]

**Graph 2. Average Customs Tariffs on Intra-Asean Imports**

Over the last decade, average customs tariffs for intra-ASEAN imports fell from 2.99% to 0.54%, with an average tariff of 0.04% for the ASEAN-6 and a fall from 6.64% to 1.33% for CLMV. This graph illustrates the rapidity of the integration process measured by customs tariffs. It should be noted that since 1997, Singapore has already reduced to 0% its customs duties on all products imported from ASEAN. Brunei has recently done likewise. Within ASEAN+6, average custom duties are 0.05%, or very close, for example, to the rate within NAFTA (0.03 %).\[5\]

Besides tariff barriers, the management of non-tariff measures or barriers (NTMs) still remains a sensitive topic, notably in periods of economic crisis during which countries are all too often tempted to implement discriminatory measures – administrative rules in order to protect national products. The new agreement – ATIGA\[6\] – signed at the 14th ASEAN summit in 2009 envisages the elimination of non-tariff barriers and the harmonisation of norms. It has also created a list of non-tariff barriers


\[5\] ASEAN Integration Monitoring Report, 2013, A joint report by the ASEAN Secretariat and the World Bank.

in order to reduce the latter. However, between 2009 and 2013 the countries of South Asia and Southeast Asia respectively introduced 307 and 148 new measures. Within ASEAN, Indonesia heads the list with 65 new measures followed by Việt Nam with 28 new measures, then Thailand with 20, Singapore with 15 and Malaysia with 13 – the remaining countries share the remainder with between one and four new measures.

Graph 3. Non-Tariff Measures Implemented Between 2009 and 2013

Progress has been minimal, although in theory non-tariff barriers should have been eliminated between 2010-2012 for the Philippines and in 2015 for CLMV. The groups of products the most commonly concerned by NTMs are chemical products and the industries associated with them (21%), the machine and electrical sector (18%), food stuffs (12%) and vegetable products (11%).


Graph 4. NTBs within ASEAN by Industry

Source: Ahsan et al. (2013).

The ASEAN Economic Community

The AEC was officially created in 2003 at the Bali summit, with December 2015 as the date set for its implementation. The AEC is based upon four pillars: a single market; a competitive economic region; equitable economic development; a region fully integrated into the world economy.

Pillar: The Single Market

This pillar is constituted of five principal elements: i) free circulation of goods, ii) free circulation of services, iii) free circulation of investments, iv) free circulation of capital and v) free circulation of qualified workers.

For the free circulation of goods, we have seen that the elimination of tariff barriers was almost achieved for the list of CEPT products, but that the management of NTMs remained a problem in spite of the drawing up of an inventory of these NTMs that should have facilitated discussion about them – even their elimination. Let us also note that an easier management of rules of origin has been made possible by the creation of a system of self-certification that allows certain exporters to proceed with this conformity certification themselves with regard to the demands of the rule of origin. Finally, a harmonisation and normalisation programme of customs procedures within ASEAN is currently underway in order to facilitate trade and reduce administrative costs.
As regards the objective of the circulation of services – AFAS\(^8\) framework agreement on services – its implementation is lagging behind the free circulation of goods. Currently, 80 sub-sectors are proceeding in the direction of liberalisation,\(^9\) which is relatively modest and finally close to what was negotiated in the framework of the WTO’s General Agreement on Trade in Services (GATS).

In order to create a climate favourable to business, a more flexible system of investments in the region was implemented through the creation of the ASEAN Comprehensive Investment Agreement\(^10\) (ACIA) in March 2012. Its objective is to promote, protect, facilitate and liberalise investments. Just like for services, this investment component remains modest because of the strong opposition to the liberalisation of investment in certain countries.

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[10] Agreement signed in 2009 but only ratified in 2012 by all the countries.
As regards the development of the capital market, financial integration is not yet on the agenda (Lacour, 2014), in spite of the willingness to create stock exchanges in all the ASEAN countries in order to offer investors greater possibilities within the region. Structural barriers persist essentially because of the heterogeneity of national regulations. Furthermore, the relatively small size of the stock and bond markets reinforces the difficulty for small countries to attract domestic and foreign investors.

Let us note, however, that in 2013, the entries of foreign direct investment (FDI) in the region reached USD 122.4bn, or +7.1% in relation to the preceding year. Even though intra-ASEAN investments have increased over the last few years, their level remains nevertheless well below that of extra-ASEAN entries. According to Lacour (2014), they do not automatically open in practice the right to work in other countries in the region; “(...) different barriers restricting access to domestic markets and limiting the mobility of the labour factor still remain, such as legal provisions that reserve certain domains for domestic nationals or fix maximum quotas for foreigners in certain sectors, economic needs tests, conditions regarding financial means or language mastery for issuance of visas (…)" Lacour (2014).

**Pillar 2: A Competitive Economic Region**

This pillar concerns the key questions related to competition policy, consumer protection, intellectual property rights, development of infrastructures and e-commerce.

A single market cannot exist in ASEAN countries without the construction of a veritable competition law. Although ASEAN has intensified its efforts to promote healthy competition and fair trade practices in the region, there remains, however, quite a lot of heterogeneity in national legal provisions – which leads Lacour (2015) to remark that it is difficult to imagine the establishment of a single competitive law at a regional level, as, currently, formal cooperation only takes the form of the organisation of regional seminars – see ASEAN Experts Group on Competition.

As regards consumer protection, the ASEAN Committee on Consumer Protection[11] (ACCP) was created specifically to develop a website devoted to consumers’ complaints and the dissemination of information about consumers’ rights.[12] As far as intellectual property rights (IPRs) are concerned, ASEAN has approved the ASEAN Action Plan 2011-2015 and has underlined that this is a crucial issue for the construction of a competitive and innovative economic region.

Infrastructures are considered to be a key issue in the cooperation of Member States. Implementation is planned of common policies concerning air transport – Single Aviation Market –, maritime and land – ASEAN Highway Network – and intra-regional cooperation in the energy and information technologies sectors. For example, the Trans-ASEAN Gas Pipeline (TAGP) aims to link together the gas pipelines of Member States. This will allow the transport of gas (including liquefied natural gas) across ASEAN borders.

The liberalisation of air services has been implemented in most countries. An agreement has been signed\(^{[13]}\) for the promotion of e-commerce through the development of information infrastructures and the willingness to reduce the digital divide within ASEAN.

These different “infrastructure” projects are supported by the ASEAN Infrastructure Fund,\(^{[14]}\) a specific fund endowed with more than USD 500m and managed by the Asian Development Bank (ADB).


\(^{[14]}\) [http://www.adb.org/site/aif/main](http://www.adb.org/site/aif/main)
Pillar 3: Equitable Economic Development

The development of small and medium-sized enterprises (SMEs) is one of the priority contents of this pillar. Indeed, these enterprises represented between 95 and 99% of the total number of enterprises in the different ASEAN countries in 2014 – with the exception of Myanmar (88.8%).[15] In order to improve the competitiveness and the expansion of SMEs in ASEAN, a first strategic action plan for the development of SMEs (2010-2015) has been launched; a second,[16] for the 2016-2025 period, has just been implemented: the main goal is to make these SMEs more innovative and competitive.

ASEAN brings together ten countries with different standards of living and levels of development, which demands the creation of a policy aiming to reduce these gaps in development. This is the goal of the Initiative for ASEAN Integration[17] (IAI) that was created in 2001. After the first plan, the IAI Work Plan II was launched for the 2009-2015 period. However, the goals have not been fully reached. According to the 2015 ASEAN annual report,[18] on 1st April 2015, 68 of the 182 planned actions had been achieved (37.4%). A third plan, for the 2016-2025 period, is set to begin.

Pillar 4: Integration into the Global Economy

ASEAN’s integration into the global economy depends on its maintaining a central position in its relations with the rest of the world, particularly during the negotiation of the free trade agreements of the ASEAN+1 type (Lacour 2014). Agreements have been signed with the People’s Republic of China, Japan, the Republic of Korea, Australia, New Zealand and India.

Balance Sheet and Heterogeneity

In order to measure the progress in the attainment of the goals defined within the four pillars of the AEC, a monitoring mechanism called AEC Scorecard has been developed. This assessment mechanism is simple: it gives a “yes” when a measure has been completely implemented; a “no” if it has not. For a measure to have been completely implemented, all the countries in ASEAN need to have adopted it, or all the activities scheduled in the framework of the measure need to have taken place (Lacour 2014).

Graph 5. ASEAN Economic Community Scorecard Key Deliverables


Graph 6. Evolution of Per capita GDP

PPP: Purchasing Power Parity.

Source: Authors' construction from World Bank data.
According to this indicator, ASEAN completed 76.5% of the 277 priority measures of AEC over the 2008-2013 period. There has been some criticism about this monitoring mechanism: its lack of transparency; the adoption of a measure does not automatically lead to its implementation. The 2015 annual report indicates that out of the 506 measures deemed to be priority ones, 458 were achieved. (see graph 5)

Even though real progress is visible in the implementation of the AEC, ASEAN member countries suffer from a great degree of heterogeneity as can be seen, for example, in the progress of per capita GDP. (see also the scores of the KOF index below). (see graph 6)

**From the AEC towards Monetary Union**

**Historical Context and Future Challenges**

Asia experienced a major change crisis in 1997-1998 involving notably Thailand, the Philippines, Malaysia, Indonesia, South Korea, Taiwan, Hong Kong and Singapore. The economic context was one of strong economic growth, a high rise in the price of assets (shares and property), growth in the investment of foreign capital in the private sector, short-term debt in dollars and a worsening trade balance.

The economic crisis in Thailand that was triggered by a fall in foreign trade and a turnaround in the value of movable and immovable assets caused a financial and currency crisis. Downward speculation on the Thai Baht took place because of the willingness of the Central Bank to defend the currency. This crisis of confidence spread to all neighbouring countries. In order to avoid a new currency crisis, the question concerning a strengthening of monetary cooperation in the ASEAN+3 region is being raised.

The single European currency was preceded by a system that anchored individual currencies to a monetary basket: the ECU – European Currency Unit. In exactly the same way, the Research Institute of Economy, Trade and Industry (RIETI) is proposing the creation of the AMU – Asian Monetary Unit – or ACU – Asian Currency Unit. In order to ascertain if the euro can serve as an example to follow, an analysis of the lessons learned from the recent European crisis is essential.

**Lesson from the European Crisis**

Just like within ASEAN, the heterogeneity of countries continues to exist within the eurozone. (see graph 7)

So how can we ensure the cohesion of the zone in order to prevent speculation – that is now impossible on exchange rates – from having a violent repercussion on interest rates, which was the case at the end of 2011-beginning of 2012 in the eurozone?

This acknowledgement of heterogeneity is not new. It was already known that cohesion would be made easier by convergence. This should notably result in higher productivity gains in low-income

countries in relation to high-income countries. However, this is not the case, particularly over the 2009-2015 period. In such a situation, there remains federalism: the transfer of revenues between countries in order to reduce disparities. But federalism is weak in this zone because of the weakness of the net contributions of member countries to the European budget.

Strengthened by this analysis of the situation, there only remains the short and medium-term solution of internal devaluation. According to the Natixis document (2015) “It is acknowledged that, in a monetary union, cost competitiveness adjustments are only done through internal devaluations (a decrease in salary costs and prices). But this creates a serious problem: as internal devaluations result in a drop in prices, they also increase the real value of debts. The rise in public and private debt levels thus results in the deterioration of the economic situation: a necessary rise in the primary budget surplus (…), a drop in housing investment (…) and in enterprise investment (…)”.

The main lesson to be learned is that it is necessary to build a project allowing economic catch-up, while allowing at the same time the creation of real budgetary federalism. The latter is all the more relevant as globalisation – the rise of intra and inter-regional competitiveness – necessarily favours specialisation and a form of heterogeneity. The road is obviously long before it will be possible to switch to a single currency within ASEAN. The first step might be the creation of an exchange rate mechanism similar to the European monetary system created in 1979.

Graph 7. Evolution of Per capita GDP in the Euro Zone

1.2.3. ASEAN Integration Measures

**Traditional Indicators**

Traditionally, world trade and the rank of each country in this trade are measured by simple indicators such as trade flows: exports, imports, trade balance. In the same way, we may measure in capital trade the role of each country through indicators of the flow of foreign direct investment (towards or from). Analysis using these indicators gives us precise information about the rank of each country, both at a regional and world level. From a historical perspective, we can examine whether regional integration has – or has not – been correlated by a rise in the importance of the zone at a worldwide level and especially by an increase in intra-zone trade.

In less than 30 years, the share of trade of ASEAN and ASEAN+3 on a worldwide level has doubled. At a more regional level, the weight of ASEAN remains stable: around 25% of the exports in the Pacific and East Asia zone; ASEAN+3 represents, for its part, more than 85% because of the weight of China, Japan and South Korea.

<table>
<thead>
<tr>
<th>Year</th>
<th>ASEAN Exports World (%)</th>
<th>ASEAN+3 Exports World (%)</th>
<th>ASEAN Imports World (%)</th>
<th>ASEAN+3 Imports World (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>East Asia and Pacific (%)</td>
<td></td>
<td>East Asia and Pacific (%)</td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>3.7</td>
<td>25.5</td>
<td>12.8</td>
<td>88.4</td>
</tr>
<tr>
<td>1990</td>
<td>4.3</td>
<td>25.3</td>
<td>13.3</td>
<td>78.7</td>
</tr>
<tr>
<td>2000</td>
<td>5.7</td>
<td>27.4</td>
<td>16.7</td>
<td>80.9</td>
</tr>
<tr>
<td>2005</td>
<td>6.1</td>
<td>24.8</td>
<td>20.4</td>
<td>83.1</td>
</tr>
<tr>
<td>2010</td>
<td>6.5</td>
<td>22.2</td>
<td>25.0</td>
<td>85.3</td>
</tr>
<tr>
<td>2013</td>
<td>6.7</td>
<td>21.3</td>
<td>26.9</td>
<td>85.8</td>
</tr>
</tbody>
</table>

*Source: Nguyen, Pham and Vallée (2015).*

A similar observation may be made regarding the flows of direct investment. The weight of ASEAN in the inflows at the worldwide level rose from 4.4% to 7.4% while those of ASEAN+3 have increased almost fourfold, from 9.2% to 36.1%. ASEAN+3 FDI outflows have considerably increased – from 7.4% to 22.4% of the total world outflows. At a regional level, the weight of ASEAN has diminished: from 47.9% to 20.5% of total inflows. This is mainly due to rise in power of China and Australia.
The expansion within worldwide trade of ASEAN and ASEAN+3 has been accompanied by an increase in the intra-regional concentration of trade activities. As the following table indicates, ASEAN+3 trade activities are characterised by trade flows between member countries: intra-ASEAN exports rose from 22.8% of the total of ASEAN exports in 2000 to 28.2% in 2010; at the same time, intra-ASEAN imports rose from 21.1% to 26.6%. Furthermore, trade flows between ASEAN and China, Japan and South Korea have experienced a significant rise over the last decade – which is probably due to the creation of ASEAN+3 in 1997.

### Table 3. Importance of ASEAN and ASEAN+3 in FDI Flows

<table>
<thead>
<tr>
<th></th>
<th>FDI inflows</th>
<th></th>
<th>FDI outflows</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ASEAN</td>
<td>ASEAN+3</td>
<td>ASEAN</td>
<td>ASEAN+3</td>
</tr>
<tr>
<td>Year</td>
<td>World (%)</td>
<td>East Asia and Pacific (%)</td>
<td>World (%)</td>
<td>East Asia and Pacific (%)</td>
</tr>
<tr>
<td>1980</td>
<td>4.4</td>
<td>47.9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1990</td>
<td>6.3</td>
<td>43.3</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2000</td>
<td>1.8</td>
<td>14.6</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2005</td>
<td>3.2</td>
<td>22.2</td>
<td>1.4</td>
<td>7.4</td>
</tr>
<tr>
<td>2010</td>
<td>5.8</td>
<td>19.7</td>
<td>3.5</td>
<td>14.5</td>
</tr>
<tr>
<td>2013</td>
<td>7.4</td>
<td>20.5</td>
<td>3.6</td>
<td>22.4</td>
</tr>
</tbody>
</table>


When we take a closer look at FDI inflows, we clearly see the importance of Japan, Europe and the USA – with a relative fall, however, in the weight of Japan and the EU to the benefit of the USA, South Korea and China. This table shows that enterprises in the most industrialised countries are the main investors in ASEAN. Nevertheless, enterprises in the region have also begun to invest in other ASEAN Member States. Thus, the intra-ASEAN FDI flow culminated at 20.1% in 2008 and then fell to 16.1% in 2010 because of the world financial crisis. Globally, the intra-ASEAN share of FDI flows remains inferior to that of extra-ASEAN flows.
Composite Indicators

Another way of examining the position and role of a country – or a region – in the world economy is to try and understand all the elements that allow us to visualise this role.

The principle of composite indicators\(^{[20]}\) (CIs) is simple. It is not possible, for example, to define the phenomenon of globalisation by only using the variable of trade flows measured by exports. Globalisation is also financial, human, cultural, etc. It is thus necessary to create a new indicator that allows us to position the country using a sum of individual indicators whose goal is clearly defined. The Human Development Index (HDI) was created for this by the UNDP – it is impossible to reduce human development to one variable that measures economic growth by per capita GDP.

We shall present quickly here two CIs that allow us to visualise the heterogeneity of ASEAN countries.

The Economic Freedom Indicator

Since 1995, the Heritage Foundation has published every year an index of economic freedom (IEF)\(^{[21]}\) for 186 countries. This index focuses on four aspects of the economic environment over which governments may exercise a certain control: freedom to produce, work, consume and invest. Ten criteria are calculated allowing us to measure: freedom of enterprise; free trade, the weight of taxes and levies, State spending, monetary stability, freedom of investment, financial deregulation, protection of private property, the fight against corruption and the liberalisation of labour.

The 2015 ranking shows that there is a big gap between Singapore (ranked 2\(^{nd}\) in the world) and Việt Nam or Laos (ranked 148\(^{th}\) and 150\(^{th}\)). To illustrate this, the table below reproduces the score of ASEAN countries for five of the ten criteria. We thus see that Cambodia is ranked last for corruption and freedom of enterprise, just as Việt Nam is for freedom of investment and protection of private property.

\(^{[20]}\) For a complete methodological presentation of CIs see OECD-JRC (2008) or Dialga and Giang (2014).
The Challenges of Regional Integration and their Assessment

Table 6. Ranking of ASEAN Countries According to FDI in 2015

<table>
<thead>
<tr>
<th>Country</th>
<th>World ranking</th>
<th>Regional ranking</th>
<th>Private property</th>
<th>Fight against corruption</th>
<th>Freedom of investment</th>
<th>Liberalisation of labour</th>
<th>Freedom of enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cambodia</td>
<td>110</td>
<td>23</td>
<td>25</td>
<td>20</td>
<td>60</td>
<td>62</td>
<td>29</td>
</tr>
<tr>
<td>Indonesia</td>
<td>105</td>
<td>22</td>
<td>30</td>
<td>32</td>
<td>40</td>
<td>49</td>
<td>49</td>
</tr>
<tr>
<td>Laos</td>
<td>150</td>
<td>33</td>
<td>15</td>
<td>26</td>
<td>30</td>
<td>57</td>
<td>60</td>
</tr>
<tr>
<td>Malaysia</td>
<td>31</td>
<td>8</td>
<td>55</td>
<td>50</td>
<td>76</td>
<td>94</td>
<td></td>
</tr>
<tr>
<td>Philippines</td>
<td>76</td>
<td>13</td>
<td>30</td>
<td>36</td>
<td>60</td>
<td>58</td>
<td>55</td>
</tr>
<tr>
<td>Singapore</td>
<td>2</td>
<td>2</td>
<td>90</td>
<td>86</td>
<td>85</td>
<td>97</td>
<td>97</td>
</tr>
<tr>
<td>Thailand</td>
<td>75</td>
<td>12</td>
<td>40</td>
<td>35</td>
<td>45</td>
<td>64</td>
<td>73</td>
</tr>
<tr>
<td>Việt Nam</td>
<td>148</td>
<td>32</td>
<td>15</td>
<td>31</td>
<td>15</td>
<td>63</td>
<td>62</td>
</tr>
<tr>
<td>Brunei</td>
<td>39</td>
<td>10</td>
<td>35</td>
<td>60</td>
<td>70</td>
<td>97</td>
<td>68</td>
</tr>
</tbody>
</table>


KOF Globalisation Index

The KOF[22] globalisation index defines globalisation as the process of creating connecting networks between players at multicontinental distances, information and ideas, capital and merchandise (Dreher et al., 2008). The index thus indicates to what extent a country is integrated into globalisation, by taking into account the political, social and economic dimensions of globalisation. This is calculated through the aggregation of variables measuring trade flows (economic dimension), the number of tourists (social dimension), or the number of embassies (political dimension).

A look at the 2015 ranking of ASEAN countries again shows the heterogeneity of the zone.

Table 7. Ranking of ASEAN Countries According to the KOF Index and its Three Dimensions

<table>
<thead>
<tr>
<th>Country</th>
<th>KOF Index Rank</th>
<th>Economic dimension Rank</th>
<th>Social dimension Rank</th>
<th>Political dimension Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunei</td>
<td>57</td>
<td>45</td>
<td>56</td>
<td>131</td>
</tr>
<tr>
<td>Cambodia</td>
<td>119</td>
<td>69</td>
<td>164</td>
<td>116</td>
</tr>
<tr>
<td>Indonesia</td>
<td>86</td>
<td>84</td>
<td>141</td>
<td>34</td>
</tr>
<tr>
<td>Laos</td>
<td>188</td>
<td>180</td>
<td>187</td>
<td>172</td>
</tr>
<tr>
<td>Malaysia</td>
<td>23</td>
<td>24</td>
<td>34</td>
<td>52</td>
</tr>
<tr>
<td>Myanmar</td>
<td>177</td>
<td>121</td>
<td>200</td>
<td>170</td>
</tr>
<tr>
<td>Philippines</td>
<td>88</td>
<td>108</td>
<td>129</td>
<td>42</td>
</tr>
<tr>
<td>Singapore</td>
<td>5</td>
<td>1</td>
<td>2</td>
<td>85</td>
</tr>
<tr>
<td>Thailand</td>
<td>41</td>
<td>46</td>
<td>63</td>
<td>56</td>
</tr>
<tr>
<td>Việt Nam</td>
<td>120</td>
<td>71</td>
<td>150</td>
<td>129</td>
</tr>
</tbody>
</table>

Source: Authors' construction from KOF data available online.

These indicators also show that countries that are relatively close in the global ranking may differ greatly according to the dimensions. A joint in-depth analysis of these rankings – KOI, IEF – and the different progress or delays in the implementation of the four AEC pillars will enable us to gain a better grasp of integration processes.

**“Network” Indicators**[23]

The network theory – also referred to as graph theory – provides us with tools that enable us to measure the position and role of each country within a network whose links (nodes) between countries correspond to the existence or not of a more or less big financial or commercial relation. The advantage of using it is that it improves our understanding of the international economy because it enables us to analyse precisely the whole structure of the interactions between countries through the use of specific indicators.

Among the network indicators, the most well-known is the degree of centrality. This indicator measures the position of a country in a network by looking at the number of links – weighted or not – that this country has with other countries.[25] The more “central” a country, the more it is connected to others. Inversely, a country that has weak links with others is said to be “peripheral”. In the case of ASEAN, the use of a non-weighted indicator to analyse international trade has no meaning as every country trades with the other ASEAN countries. The use of this indicator thus depends on the weighting of links and the size of the transported flows – such as the value of exports or FDI. In order to get a better grasp of the network in place within ASEAN, this network has been deliberately extended to include that of ASEAN+3.

The following table gives the 2003 ranking of ASEAN+3 countries according to the value of their degree of weighted centrality in the oriented network defined by the flow of in-Degree exports, which correspond to the country’s imports, and in the network of out-Degree flows, which correspond to exports from the country. The weighting is carried out using an export value \(X\) between countries (from or towards), and using this same value divided by the size of the country measured by its GNP \(X/GNP\). In terms of absolute value, China, Japan, and South Korea are the most integrated countries in regional trade. Japan and South Korea have always played a central role both before and after the creation of ASEAN+3.

The reading of the weighted network in terms of relative value provides a new perspective of the situation of Japan and China whose situation appears a lot more ambivalent. Although these two countries are respectively in first and second place in terms of centrality for in-flows, they are only in 12th and 13th place for out-flows. This result illustrates their central role as importers of products from ASEAN to then export outside ASEAN+3. The founding countries of ASEAN, such as Singapore and Malaysia, have succeeded in maintaining an important position in the commercial network of

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[23] This section is largely based upon an article by Nguyen and Vallée (2015).
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ASEAN+3. However the position of Malaysia is the opposite to that of China: it plays a central role as exporter towards ASEAN+3 and a weaker role as far as imports are concerned. Finally, let us note the case of Brunei, which in terms of absolute value has relatively little importance in the network (10th and 12th rank) and which relatively, in relation to its size, benefits from an influential position for exports within the zone (2nd rank).

Table 8. Ranking According to the Weighted Degree of Centrality of ASEAN Countries in Trade Networks in 2013

<table>
<thead>
<tr>
<th>Rank</th>
<th>In-Degree</th>
<th>Out-Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>X</td>
<td>X/GDP</td>
</tr>
<tr>
<td>1</td>
<td>China</td>
<td>Japan</td>
</tr>
<tr>
<td>2</td>
<td>Japan</td>
<td>China</td>
</tr>
<tr>
<td>3</td>
<td>Korea</td>
<td>Thailand</td>
</tr>
<tr>
<td>4</td>
<td>Singapore</td>
<td>Korea</td>
</tr>
<tr>
<td>5</td>
<td>Malaysia</td>
<td>Malaysia</td>
</tr>
<tr>
<td>6</td>
<td>Indonesia</td>
<td>Indonesia</td>
</tr>
<tr>
<td>7</td>
<td>Thailand</td>
<td>Singapore</td>
</tr>
<tr>
<td>8</td>
<td>Việt Nam</td>
<td>Việt Nam</td>
</tr>
<tr>
<td>9</td>
<td>Philippines</td>
<td>Philippines</td>
</tr>
<tr>
<td>10</td>
<td>Myanmar</td>
<td>Cambodia</td>
</tr>
<tr>
<td>11</td>
<td>Cambodia</td>
<td>Myanmar</td>
</tr>
<tr>
<td>12</td>
<td>Laos</td>
<td>Laos</td>
</tr>
<tr>
<td>13</td>
<td>Brunei</td>
<td>Brunei</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations from data available online—United Nations Commodity Trade Statistics Database (UN Comtrade), Organisation for Economic Co-operation and Development (OECD), ASEAN, United Nations Conference on Trade and Development (UNCTAD).

As for the network formed by the FDI flow, the table below gives the ranking for in-flows and out-flows, in absolute or weighted terms by GDP, as it also does for exports. In terms of received FDI (absolute or relative), China is ranked first, followed by Singapore and Indonesia. Japan and Singapore play a central role in supplying FDI flows towards ASEAN+3. Furthermore, this table shows us that the biggest FDI flows are mainly transferred between the biggest or most advanced countries. In other words, small countries, or those that are the least advanced, are at best considered to be only satellites of the regional FDI network. In relation to trade flows, taking into account the size of a country does not greatly change the rankings. However, China that is ranked fifth for FDI outflows (i.e. as supplier/investor) falls into 9th place, if we take its size into account. This has an even greater impact on the position of Japan: it goes from first place as the region’s main supplier of capital to fifth when we take into account its level of wealth. It is Singapore that becomes the central country, and thus the number one exporter of capital in ASEAN+3, with regard to its capacities measured by its GDP.
Conclusion

At a time when the AEC is being established, it seems to us it is important to understand the challenges of this integration from a theoretical point of view, and the stages of its construction. We have also taken a quick look at the outlook for the AEC. Obviously, the eurozone, with its difficulties, can serve as a textbook case to common markets wishing to continue their path towards monetary union. Integration must not only be measured by the mechanical counting of the goals reached (i.e. lowering of customs tariffs, etc.), but must also be appreciated and assessed in its economic reality via the intra-zone flows or the dynamics of specialisation. We think that even though the traditional tools of measurement for integration are useful – they allow us to measure financial and trade flows – it is necessary to develop other conceptual tools in order to analyse more efficiently the complexity of phenomena. These tools allow us to both understand the evolution using a more global approach – the case of composite indicators – and gain a better grasp of the evolution of market structures thanks to network indicators. Ultimately it entails verifying to what extent the creation of the AEC has resulted in the creation of new intra-regional perspectives and if these perspectives are compatible with greater cohesion in the region.
References


1.3. Methodological and Theoretical Approach to Economic Corridors in Southeast Asia

Nathalie Fau – University Paris 7

This presentation is based on collective work carried out over a four-year period (2008-2012) in the framework of a research project financed by the French National Research Agency (ANR). Three laboratories, from the French National Centre for Scientific Research (CNRS), SEDET (CNRS/Paris 7), the Southeast Asian Centre (CASE, CNRS/EHESS) and the Center for Mexican and Central American Studies (CEMCA, the French Ministry of Foreign Affairs, located in Mexico) submitted a joint bid for the call for projects relating to countries of the South, opened in France by the ANR in 2007. The project, entitled “Transnational dynamics and territorial restructuring, comparative approach to Central America and Southeast Asia” (Transiter: Dynamiques transnationales et recompositions territoriales, approche comparative Amérique centrale et Asie du Sud-Est) was selected at the beginning of 2008.[26]

One of the goals of the project was to compare the regional integration process in island Southeast Asia by focusing research on economic corridors. In order to study these transnational dynamics, two areas were chosen: the Greater Mekong Subregion (GMS) and the Strait of Malacca. (see map 4)

The GMS, which was created at the end of the 1980s, unites the five countries of the Indochinese Peninsula and two provinces in the south of China (Guangxi joined Yunnan province at the end of 2004). The Asian Development Bank (ADB) proposed to found regional integration on the basis of a re-launch of the trade exchanges that had been interrupted first by colonisation, and then by decades of war. Grouping together the peninsula’s five ASEAN countries and opening the border to China have led to the bringing together, for the first time in a transnational programme, of all of the 312 million inhabitants of the GMS. As for the Malacca Strait, this area is not really defined institutionally but was chosen because it constitutes a coherent spatial unit, both through its dynamics and the creation to the north and the south of the Strait, of cross-border cooperation areas. The

[26] I take this presentation as an opportunity to pay my respect to Muriel Charras who piloted the Southeast Asia part of this programme and who passed away on 28th January 2015.
Map 4. The Corridor Network of the GMS and the Malacca Straits Region

Corridor linkages

GMS and IMT-GT corridor linkages:
- Existing route
- Under construction or planned

Hierarchy of nodes

SINGAPORE
- First rank global city

Bangkok
- First rank capital city

Vientiane
- Second rank economic or political capital city

Phuket
- Second rank regional city

Danang
- Second rank regional city heads of GMS corridors

Palembang
- Other regional city or province capital

Dumai
- Other city


GMS: Great Mekong Subregion (RGM in French).
Malacca Strait is located between the east coast of Sumatra in Indonesia on one side, and the south of Thailand, the west coast of the Malay Peninsula and the city-state of Singapore on the other. In this study, the space we called the “Malacca Strait” also includes the Strait of Singapore that is part of the same dynamic. The originality of the Malacca Strait is that it is both an area of exchange and a major transit zone for international trade, in which neighbouring countries have always been closely integrated, and a region in its own right, which has been modelled, in spite of the borders, by the historical trade and cultural relations between the two sides of the Straits. The interest of this comparison also lies in the possibility of studying the similarities and specificities of the transnational maritime and continental spaces. Is this classical division of Southeast Asia between mainland and maritime Southeast Asia still significant in the framework of an analysis of transnational spaces?

This presentation and the subsequent workshop will chart these debates. The results of this research have been published in the book *Transnational Dynamics in Southeast Asia, the Greater Mekong Subregion and Malacca Straits Economic Corridors*, edited by myself with Sirivanh Khonthapane and Christian Taillard and published by the Institute of Southeast Asian Studies (Fau et al., 2014). This presentation is also based on personal research into connectivity and growth triangles in Southeast Asia.

### 1.3.1. Growth Triangles in Development Corridors

The processes of cross-border and transnational integration are currently experiencing a strong dynamic, given the hope that such cooperation inspires both in politicians and the private sector. They have been multiplying and have been experiencing a certain boom, over the last ten years or so, mostly in different cultural regions. In Southeast Asia, these new regional constructions have resulted in at least two forms, whose mechanisms are often very similar but whose spatial logistics are different: growth triangles that are areas of cross-border economic development, and development corridors.

**Growth Triangles and Cross-Border Economic Development Zones**

In the 1980s and up until the middle of the 1990s, many different terms were used to designate the zones of cross-border economic cooperation in Asia: growth triangles or polygons, natural economic entities, soft regionalism, metropolitan extension zones, cross-border industrial zones for exports (Fau, 1999). Articles published on this subject thus focus most often on case studies, particularly those of SIJORI (a cross-border zone of economic cooperation uniting Singapore-Johor in Malaysia and Batam in Indonesia) or of the Hong Kong-Guangdong zone. They then attempt to establish a model. The term growth triangle has been known the longest. It was used for the first time on 21st December 1989 by Goh Chok Tong, who was then Vice Prime Minister of Singapore, following a bilateral agreement signed with the state of Johor – Joint Committee on Business Cooperation – on the one hand, and with the Indonesian government for the development of Batam island on the other. The theoretical purpose of this cross-border cooperation was to promote the regional economic development of the three territories (Singapore-Johor and Riau), which all have different advantages, in order to form a wider economic basin with greater potential. The
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interplay of complementarities between the three players should result in the creation of a global synergy that is likely to help the region develop, make it more attractive for investors and increase the economic efficiency of the SJORI region. The term was then used to designate the Hong Kong-Guangdong zone as it has close development similarities with SJORI. It was then generalised to designate cross-border and sub-regional spaces in East and Southeast Asia. Following the economic success of the SJORI and the Hong Kong-Guangdong “growth triangles”, a second generation of cross-border cooperation appeared on paper almost everywhere in East and Southeast Asia. It is in this context that the GMS was created. This spread of “growth triangles” and sub-regional zones may be explained by the role of the ADB that first theorised this development model before extending it to the scale of the Asia-Pacific front.

Map 5. Growth Triangles in East Asia

http://www.wtec.org/loyola/em/02_07.htm
The Corridors

At the end of the 1990s, the growth triangles and zones were either replaced or made more complex by the introduction of a new tool in the proposals of the ADB: development corridors, which were also referred to as economic corridors.

Map 6. Two Generations of Economic Corridors in the GMS

It was in the continental part of the GMS that this new development model made most progress (Taillard, 2009). The original goal of the ADB was to reconstruct road infrastructures in order to encourage the resumption of economic relations between the countries of the peninsula and thus erase the spatial fractures of the colonial period and the Cold War to the benefit of new regional integration. During the 1992-2002 period, the ADB supported the creation of five economic corridors, both north-south and east-west; the most structured and ambitious are the North-South corridor that runs from Kunming in Yunnan to Bangkok in Thailand after having descended along the Chao
Methodological and Theoretical Approach to Economic Corridors in Southeast Asia

Phraya River basin and crossed through four countries (China, Myanmar, Laos and Thailand) and the East-West corridor that links the two coastlines of the peninsula and Myanmar to Thailand, Laos and Việt Nam. Let us also note that the South corridor that links the capitals Bangkok, Phnom Penh and Hồ Chí Minh City ought to play an increasingly bigger role as an extension is scheduled to Tavoy in Myanmar. In a second period (2002-2014), the network of corridors diversified and became more complex with notably the inclusion in 2004 of a second Chinese province, Guangxi, and the taking into account of railway infrastructures.

After taking note of the success of these corridors in the continental part, the ADB also wanted to implant them in the maritime part, notably in the Malacca Strait. In its 2007-2011 development plan for the Indonesia-Malaysia-Thailand growth triangle (IMT-GT), the ADB defined five corridors: two land ones that run along the coast of Sumatra and the west coast of Malaysia and three maritime ones that link the two sides of the Malacca Strait. The objective is to strengthen flows, notably containerised ones, between the ports located on either side of the Malacca Straits: Songkhla-Penang-Medan, Melaka-Dumai, and Ranong-Phuket-Aceh. These ports must function as twin ports in the same way as the urban pairs on either side of land borders.

Definition of Economic Corridors

A lot of literature exists about corridors (Debrie and Comtois, 2010) that has been written by geographers and economists, but also by economists of regional and international organisations (International Monetary Fund – IMF, ADB, United Nations (UN)). In order to clarify this concept, we shall address, one after the other, transport corridors, then urban corridors and finally economic or development corridors.

Transport corridors, in geography and more particularly in transport geography, are trade routes that concentrate flows of passengers and freight. The transport corridor is a historical model of trade links between major cities that favour better connectivity between the areas in a territory. These corridors present an actual framework that allows us to locate national poles and the principal nodal cities, to open up the hinterlands or provide access to resources (Rodrigue, Comtois and Slack, 2006). In the 19th century in Europe, networking between urban and industrial poles led to the emergence of linear axes that became more complex as technical innovations completed what means of transport offered. A transport corridor is thus distinguished by its multi-modality: a waterway may be coupled with a railway line and by a road axis linked to ports and airports. Hence, transport corridors are wealth accumulation areas (trading activities and economic functions) and the preferred places for spatial accumulation: as distribution costs are lower than elsewhere, they enable economies of scale and thus favour a process of demographic and economic concentration. Even if one mode of transport is often dominant, transport corridors are above all integrated logistical axes whose function is to ensure the fluidity and continuity of an ever-increasing trade flow. The private sector and notably international transport operators are in direct support of the integration of these axes. It is on this point that the approach of geographers and logisticians merges.

Urban corridors are linear spaces structured by the modes of transport, which, by offering better accessibility and better connectivity, support the development of a linear urban region. The first structured urban corridors appeared in North America; Jean Gottmann (1961) accurately
describes the functioning of the North American megalopolis that breaks with the classical model of urbanisation, city centre-outskirts, and adopts a polycentric configuration. The urban region of the coast of the United States stretches continually over more than 1,000 km and encompasses six metropolises with a million inhabitants (Boston, Providence, New York, Baltimore, Washington and Richmond). The integration of the space of a megalopolis is based upon a dense network of transport, motorway and railway networks that constitute the principal intersection of the whole continent (Main Street) and support relations and intense flows: commuter travel, economic trade and even freight transport. Since the work of Gottmann, urban corridors have been identified on local, regional and even worldwide scales: Tokyo-Osaka-Kobe in Japan, the London-Milan European backbone or, in Asia Pacific, the Tokyo-Jakarta corridor that is sometimes referred to as a “megaurban corridor”. Rimmer (2004) also suggests a “megaurban” corridor covering the whole of Southeast Asia from Bangkok to the south of the Malaysian peninsula, through the inclusion of Kuala Lumpur and Singapore, and continuing along the east coast of Sumatra, and then towards Java and Bali. On a larger scale, urban corridors are also referred to in Asia as “Extended Metropolitan Regions” or *Desa Kota* made popular by McGee and used to qualify urban regions including several metropolises and their hinterlands that develop both rural and non-rural activities linked by transport axes.

Economic corridors were popularised by the UN and big international institutions. These institutions grasped the notion of transport corridors and classified them into multiple categories: development corridor, trade corridor or growth corridor. In 2002, the UN (ESCAP, 2009) launched a project entitled *Capacity-building in developing interregional land and land-cum-sea transport linkages* whose aim was to identify in each region of the world the interregional transport liaisons that would contribute to better integration and encourage economic development. According to UN planners, transnational corridors constitute a new geographical space where strategies of urban development and competition are deployed (Bender, 2001). It is not simply a question of linking cities to each other by more efficient communication axes, creating new ones or improving old, but developing new types of multipolar and transnational spaces, which link between them existing urban regions and emerging ones. In theory, this does not concern megacities, but it should create new externalities to be seized by many medium and large-sized cities, notably in inland and border regions or on new frontiers. These corridors serve to encourage the implantation of new productive activities thanks to improved accessibility, the development of energy infrastructures and the transformation capacities of local production. The corridors must encourage the development of the fringes and not the principal structuring nodes.

The diverse forms of these corridors as development strategies share several characteristics. The corridors are first envisaged as planning tools whose aim is to channel investment projects and strengthen the processes of economic growth. Their implantations must lead to the reduction in the cost of imported products, improve access to international markets, facilitate the industrial network and improve the interdependence of different sectors of the economy.

The corridors are also conceived as tools of regional integration and not only national integration. They transcend physical, political, administrative, social, and economic frontiers.

The corridors are envisaged as new tools of governance. The public action of States is made more complex through not only the necessity of multiplying bilateral or multilateral agreements, but also
Methodological and Theoretical Approach to Economic Corridors in Southeast Asia

that of taking into account, on the one hand, the private sector that finances and uses these corridors and, on the other hand, local authorities whose power has increased through decentralisation. The management of transnational corridors imposes a new framework of governance involving the implementation of collaboration between multitudes of players. The ideal design presented is one of decentralised international relations where the State would play a secondary role and would be replaced by bottom-up initiatives and no longer top-down ones.

This corridor-based development model was implemented by the UN and the regional banks on all continents. The first session of the workshop will indeed be devoted to a comparison of corridors in Asia, Africa and Latin America in order to assess the similarities and the different goals and the means implemented on the different continents. By way of an example, in Latin America, the east-west bi-oceanic corridors (Initiative for the Integration of Regional Infrastructures in South America – IIRSA) aim to link the two seabords and also link places of production, notably agricultural, forestry and energy with places of consumption (Bender, 2001), which are mainly situated along the coast; it is often less expensive to import consumer goods by sea than to send them from within territories. In Europe, the corridors give support to economic integration projects. The nine, and then ten, Pan-European corridors launched by the European Commission and the European Conference of Ministers of Transport thus have the objective of linking the countries of central and eastern Europe to western Europe: “The corridor is firstly a complementary notion to the trans-European network that figures in the treaty of Maastricht as an element of European Union cohesion. It is considered as a multi-modal guiding axis that links countries that are in the process of joining the European Union.” (Debrie and Comtois, 2010).

1.3.2. The Place of Corridors in the ASEAN Connectivity Plan

*Presentation of the Connectivity Plan*

The term “connectivity” emerged among members of ASEAN during meetings about the construction of the ASEAN Economic Community (AEC). Subsequent to numerous debates about this subject during the 15th ASEAN Summit in October 2009, the Master Plan on ASEAN Connectivity (MPAC) was adopted in 2010 at the 17th ASEAN summit. (see diagram 2)

The Plan is based on three pillars: the improvement of the institutional framework in order to reduce tariff barriers and encourage the creation of a single market in the maritime and air sector; the implementation of legislative frameworks favouring the greater mobility of people within ASEAN; the development of transnational transport infrastructures whose objective is to promote connectivity within ASEAN (ASEAN, 2011). The ASEAN connectivity plan is based on the premise that there is an evident link between the construction of infrastructures, the opening up of territories and their inclusion in networks, and economic development. The development projects for transport infrastructures formulated in the MPAC include the key guidelines set out in the preceding plans: the Transport Action Plan 1999-2004, the ASEAN Transport Action Plan (ATAP) 2005-2010, and the ASEAN Strategic Transport Plan (ASTP) 2011-2015 (Basu Das, 2013).
In the domain of land infrastructures, the two leading projects are the ASEAN Highway Network (AHN) and the Singapore-Kunming Rail Link (SKRL). In all the ASEAN countries, the improvement of road infrastructures is a national priority that is increasingly thought about in coordination with the networks of bordering countries. The AHN project that was ratified in 1999 is a component of the Trans-Asian Highway (TAR). The objective is to bring up to class 1 standards, by 2020, a network of 23 transnational roads covering 38,400 km and construct the missing road segments notably in Myanmar, Laos, Việt Nam and Cambodia. (see map 8)

On the other hand, in spite of an extensive rail network that was mainly built during the colonial period, ASEAN has been slow to implement a policy of regional development for its rail sector. In the 1960s, the UN had, however, proposed to support, within the TAR framework, the construction of a railway linking Southern China to Malaysia via Indochina. However, because of lack of maintenance, the network deteriorated rapidly and it still remains today underused both for freight and passengers. The SKRL project (ASEAN, 2011), which was proposed at the 5th ASEAN Summit in December 1995, is a branch of the Pan-Asia Railway Network. Its objective is to integrate, modernise and rehabilitate the already existing railway networks and build the missing segments in order to link Kunming, the capital of Yunnan in China, to Singapore via the railway lines that run down the two coasts of the Indochinese Peninsula. In the maritime transport sector, the MPAC plan has designated 47 priority ports to improve the maritime network within ASEAN. There is a dual aim: facilitate maritime liaisons between countries of mainland Southeast Asia and improve connectivity between the continental and maritime parts of Southeast Asia. One of the main projects is to extend to the scale of ASEAN
the “Roll on/Roll off” system of transport that has already been tested in the Philippines and that has resulted in the reduction of development inequalities within this archipelago.

**Map 8. The Kunming-Singapore Railway Project**


**Innovation of MPAC: Intermodalism and Spatial Approach - and No Longer Sectoral - to the Development of Infrastructures**

With regard to the preceding ASEAN transport plans, the MPAC is innovative in encouraging the development of intermodalism (Fau, 2015). The improvement of connectivity within ASEAN cannot depend on just one mode of transport. The definition of the concept of “connectivity” for a geographer specialising in networks is the ability of a network to offer alternative itineraries between places, either by meshing the space, or by developing on the same axis, several modes of
transport, or by both. The MP&C thus affirms the necessity of improving liaisons between modes of transport (ASEAN, 2011).

As well as offering a sectoral approach, the MP&C also develops a spatial strategy of infrastructure implantation: the concentration of flows through the construction of economic corridors, and the regionalisation of planning through the identification of the specific demands and needs in infrastructure of sub-regions. From the outset, the demarcation of the economic corridors was not conceived so much on the scale of the whole of ASEAN as on that of the three sub-regions (ASEAN, 2011): the Greater Mekong Subregion, the IMT-GT growth triangle and the Greater East or BIMP-EAGA (Brunei Darussalam, Indonesia, Malaysia and the Philippines-East ASEAN Growth Area) region.

1.3.3. A Transdisciplinary Approach to Corridors

The Transiter project was determinedly comparative. The objective was to study the interactions between transnational dynamics and territorial restructuring by using theoretical tools and a common analysis grid. In order to facilitate the exchanges between the researchers from different scientific disciplines (geographers, economists, historians, urban planners and anthropologists), the specific vocabulary used for regional integration and cross-border and transnational areas had been specified during our research seminars. It is precisely around this transdisciplinary approach that our JTD workshop will be organised.

Geographic Approach

Geography questions the existence (or not) of the structuring effects of transport on territories and the interactions between communication networks and spatial dynamics. In January 2014, the review \textit{L'Espace Géographique} (2014) returned to this debate in its dossier “The Debate”. Geographers notably insisted on the absence of any mechanical and systematic impact of transport infrastructures on the development of territories. They do not contest the necessity of developing infrastructures to encourage exchange, “\textit{It is difficult to imagine a territory without transport networks, in so far as the latter constitute at the same time the support, the condition and the concrete manifestation of the exchanges of all types that they generate. Transport networks are more than a support for the functioning of territories, they are also a factor of their development in so far as they generate little by little, in the areas where they are organised, territorial and social solidarity.”} (Offner and Pumain, 1996). What they contest is the univocal causation link between transport and development (Offner, 1993). In France much work has been carried out into the impact of high-speed railway lines: although they can integrate outlying areas and open up territories, they may also simply cross through these territories – tunnel effect – or suck up the resources of these regions – pump effect.
Methodological and Theoretical Approach to Economic Corridors in Southeast Asia

Map 9. Cities and Corridors in Southeast Asia

Corridor linkages

- GMS, IMT-GT and Sumatra corridor linkages:
  - Existing route
  - Under construction or planned
  - First trans-Sumatra route

Pair functioning

- Twin city
- Pair city
- Regional inland city commanding a transnational twin or pair city

Hierarchy of nodes

- **SINGAPORE**
  - First rank global city
- **Bangkok**
  - First rank capital city
- **Vientiane**
  - Second rank economic or political capital city
- **Phuket**
  - Second rank regional city
- **Danang**
  - Second rank regional city heads of GMS corridors
- **Pekanbaru**
  - Other regional city or province capital
- **Dumai**
  - Other city

In the framework of our workshop, I will study this question by analysing the impact of the construction of transnational corridors on the development of cities. The national policies of Southeast Asian countries have, until now, especially aimed at reattaching peripheral areas to the national capital through the construction of new infrastructures. However, the development of cross-border regions changes the outlook of these peripheral areas by inciting them to play a bridging role in the framework of a more polycentric regional organisation. Does the strategy of networking Southeast Asia with transport axes result in the strengthening of already existing poles or, on the contrary, does it encourage the emergence of new poles (Franck, 2014)? (see map 9)

In the framework of the creation of economic corridors, the ADB insists on the major role of two types of nodes that structure the internal functioning of corridors: the extremities of the corridors on the one hand, and border areas and border towns on the other (Fau, 2015). One of the originalities of the ADB programme and the MPAC is, however, to promote the integration of the corridors through the development of border areas in spite of their positions that are often peripheral on a national scale. The main aspects of this strategy are: the multilateral Cross Border Transport Agreement (CBTA) and the planning and financing of free trade zones or special economic zones in the border areas, as well as direct financial support for the improvement of the infrastructures of border cities located along the corridors.

In the workshop, the example of the GMS East-West corridor will be studied in order to assess its impact on the development of cities, notably the bridgeheads, ports, border cities and twin cities (Lainé, 2013 and 2014; Ishida, 2013).

**Logistical Approach**

For logistics, the central issue is that of the fluidity of the corridors and their aim is to remove the load breaking that may obstruct this fluidity: it may be technical – different railway gauge, missing road segment or unlevelled roads – or even institutional – border blocking or a difference in regulations between the countries crossed. Logistics may be presented as the continual search to optimise flows and it takes equally into account transport, handling, storage, preparation of orders, stock management, etc.

In the classification that Ruth Banomyong proposes (2008 and 2014), economic corridors – a name adopted by the ADB – only intervene at the end of a process that allows the progression from transport corridor, via intermediate stages (multimodal corridor and logistic corridor) to finally result in an economic corridor. Transport corridors – the first type of classification – link the most productive places and encourage trade between them through a reduction in transport costs. In so doing, they tend to increase territorial inequalities by further marginalising abandoned areas. Multimodal corridors, which are a variation of the first type, have infrastructures that ensure connectivity between certain nodes with at least two modes of transport that are managed by an operator who provides an efficient service that is as rapid and cost efficient as possible. The third type, logistic corridors, require the conjunction of private and public players in order to optimise
the circulation of flows along the corridor and arbitrate between the interests of the different users. The fourth type, economic corridors, aim to attract investment in order to disseminate new activities all along the corridors by strengthening the prioritised nodes that structure them, and by optimising both the material infrastructures, the hardware, and their regulation, the software, notably at cross-border passages. This progressive typology has the advantage of being flexible as certain stages may be skipped and others added. Its aim is to assess the performance of the whole corridor. By again using the methodology used in the supply chains, each corridor is assessed by a comparison of the level of its weakest link. For logisticians, the dominant criteria are journey time and transport cost.

Table 10. Typology of Corridors according to the Asian Development Bank

<table>
<thead>
<tr>
<th>Stage</th>
<th>Corridor</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>Transport Corridor</td>
<td>Corridor that physically links an area or region.</td>
</tr>
<tr>
<td>Type 2</td>
<td>Multimodal Transport Corridor</td>
<td>Corridor that physically links an area or region through the integration of various modes of transport.</td>
</tr>
<tr>
<td>Type 3</td>
<td>Logistics Corridor</td>
<td>Corridor that not only physically links an area or a region but also harmonizes the corridor institutional framework to facilitate the efficient movement and storage of freight, people, and related information.</td>
</tr>
<tr>
<td>Type 4</td>
<td>Economic Corridor</td>
<td>Corridor that is able to attract investment and generate economic activities along the less developed area or region. Physical linkages and logistics facilitation must first be in place.</td>
</tr>
</tbody>
</table>


Economic Approach

In the workshop, Elsa Lafaye de Micheaux was in charge of the economic approach to the corridors, and notably the analysis of the methodology and tools implemented by the Economic Research Institute for ASEAN (ERIA). During the 2010 East Asia Summit, ERIA proposed a project for the
development of transport and logistical infrastructures for ASEAN (ERIA, 2010). This plan is based on the observation of development inequalities between ASEAN countries, and also within each of these countries; it constructs a typology in three groups of the economic areas within ASEAN by classifying them according to their level of economic development:

- “Tiers 1” are areas where industrial production is concentrated, and which are often threatened in their innovative capacity by too much agglomeration and risks of congestion (Singapore, Selangor, Bangkok, Hà Nội, Jakarta);
- “Tiers 2” are committed to the industrial process but their advantages, like their location or population density, could no longer be developed (Phnom Penh, Vientiane, Medan, Yangon, Đà Nẵng, Davao, Makassar);
- “Tiers 3” are areas at the fringes of industrial development that are still confined to the primary sector (Dawei, Poipet, the mountainous regions of Cambodia, Laos and Myanmar).

Starting from the basic consideration that industrial production can be broken down into several independent stages and that each one has its own technico-economic characteristics, ERIA underlines the fact that it is absolutely possible to break down the production process in function of the "comparative advantages" of each region. However, this functioning, which has indeed been implemented for years in the automobile, electronic, textile and clothing, and agro-industrial sectors of East and Southeast Asia, could be extended by linking more systematically, through quality transport infrastructures, the “Tiers 1” to “Tiers 2” and “Tiers 3” that have the potential for industrial development. Furthermore, in order to avoid too great a concentration of investments on a single axis, ERIA prescribes a networking of Southeast Asian territories with several corridors that cross through each other and an extension of these corridors towards bordering countries.

**Historical Approach**

The historical approach will be presented by Hugues Tertais. It is first of all important to insist upon two points that will be dealt with in the workshop.

The first is the difference in the historical trajectories between the continental and maritime parts of Southeast Asia before the implementation of corridors. The continental part was fragmented and trade was interrupted by colonisation then by decades of war. The aim of the ADB in launching the GMS was to re-establish the links between the countries of mainland Southeast Asia. The memory of these divisions and these conflicts is still, however, present. Thus, Vathana Pholsena (2014) raises questions about the significance of road 9 for the populations of the Sepon district in the province of Savannakhet in the south of Laos: for them, road 9, which was damaged by years of conflict, is above all a reminder of past atrocities and barbaric acts. The local populations see its reconstruction as a means of rebuilding the future and reconnecting with civilisation. The road has become a new symbol of a possible renaissance. On the other hand, even though mainland Southeast Asia has lost its former regional coherence, which Charles Robequin used the term “Malay world” to describe – as a result of the spatial division introduced by the British, Dutch, Spanish and then American colonial powers – trade between the two sides of the Malaccan Strait has always continued. The corridors are only superimposed on flows that already existed.
Map 10. The Reactivation of Old Corridors: Current Corridors and Caravan Routes

Former Caravan Linkages

New economic corridor linkages in the Greater Mekong Subregion (since 2002)

Corridor linkages First decade (1992-2002)
- Existing route
- Under construction

Corridor linkages Second decade (2002-2012)
- Existing route
- Planned for 2012

Hierarchy of nodes
- Head of network
- Major node
- Secondary node
- Other city

The second point is what we call in geography, “rugged space”, in the sense that the structures of spatial organisation leave traces behind them that may be reactivated. As Christian Taillard (2014) demonstrates, the corridors reuse, but by modifying the logics, the axes of the ancient caravan routes. It is also interesting to understand the logics of the new silk roads, both land and sea ones, that China launched in 2013. Thus, in 2013, during an official visit to Indonesia and then during the 16th ASEAN+ China Summit in Brunei, China launched the “Maritime Silk Road” (MSR), a term that referred to the maritime expeditions of the 15th century led by Admiral Zheng He in Southeast Asia and in the Indian Ocean as far as the Persian Gulf. The advantage of this term is that it has peaceful connotations, as these voyages of exploration did not lead to overseas expansion enterprises but to the development of commercial trade (Fau, 2015). The announced goal of the MSR is thus to strengthen maritime cooperation between China and ASEAN countries.

Map 11. The Extension of Networks towards China and India: Road Networks

Geopolitical Approach

The geopolitical approach is all the more relevant only when the essential aim of the MPAC is to improve connectivity within ASEAN member countries and when connectivity with bordering countries, notably China, India and the countries of East Asia, is not, at the same time, neglected. The objective is to affirm the “centrality” of ASEAN, that is to say the unity of the region, in the face of its neighbours’ economic power. ASEAN wishes to make use of its position as an intersection of infrastructures in Asia to neutralise the influence of its big neighbours by counterbalancing them. (see maps 11 and 12)

Map 12. The Extension of Networks towards China and India: Railway Networks

Thus, in order to reduce the growing influence of China in the connectivity plans of Southeast Asia, the MPAC supports the initiative of the Mekong India Economic Trade Corridor (MIETC). This plan proposes the implementation of two roads (Kimura and Umezaki, 2011): one maritime, linking Bangkok to Chennai in India via Dawei in Myanmar; the other terrestrial, linking Moreh in north India to Mae Sot in Thailand, via Bagan in Myanmar. Thus, the ever-increasing implication of outside powers in these areas of transnational cooperation leads us to raise the question about the future of ASEAN in the current framework of the reconfiguration of Asia. The construction of transnational corridors thus contributes to the redefinition of the foreign policies of ASEAN countries by inciting them to take into account national strategies of neighbouring countries outside ASEAN. Infrastructures have always been an instrument of power and the term “connectivity” allows us to simply ignore these challenges in silence. In the GMS, there thus exists growing competition between China and Japan to impose their hegemony over the transnational corridors: if China dominates the North-South corridors, Japan is investing massively in the East-West corridors. In the same way, the rivalry between Thailand and Việt Nam for the control of the peninsula may thus be seen in the infrastructural investments in the neighbouring countries in the framework of the competitive sub-regional cooperation area.

1.3.4. A Multi-Scalar Approach

A multi-scalar approach, besides being a compulsory step for geographers, also makes it possible to confront discourse more efficiently with the reality of the field. The multiplication of initiatives and programmatic discourse indeed raises the question of the feasibility and reality of these transnational integration projects. One of the working guidelines of the Transiter programme has thus been to analyse the discourse of international organisations and national and local authorities in order to confront them with the realities observed in the field, so as to identify the complementarities and also the contradictions of these different discourses; the strategies of international institutions and donors are not necessarily visible in local or national planning programmes.

We shall quickly present here the main questions that are being raised at the different scales (Fau, 2014b).

Regional Scale: the Corridors, Tools of Cohesion or Division within ASEAN?

Whether it be a question of the GMS or growth triangles, the different zones of cross-border and transnational cooperation that have been implemented are always presented as a way of strengthening ASEAN and as a first stage in the formation of a vast area of free trade whose limits, furthermore, are progressively shifting beyond those of ASEAN. The dysfunctions observed in these transnational areas point out, however, the difficulties in implementing the charter that was ratified in December 2008 in which the ASEAN partners committed themselves to set up, in 2015, a single market. Even though the division into sub-regional zones had the objective of better determining priorities and needs in infrastructures, it may also have contributed to a division between the continental part and the maritime part (Fau, 2015). Several elements allow us to support this hypothesis:
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- The unequal involvement of the ADB in the development between the maritime and continental parts. The ADB, which plays a central role in the development of the construction of the GMS, has, however, a very small role in the construction of the IMT-GT. Since 1992, its commitment and implication have played a central role in the credibility of this initiative, both with the countries of the region and donors. However, the Bank is a late-comer in the framework of the IMT-GT project, as it has only intervened since 2007, while this cooperation zone was created in 1993 subsequent to a trilateral agreement between Indonesia, Malaysia and Thailand. Furthermore, it played no role in the creation of the SIJORI growth triangle, which developed, on the contrary, without any formal agreement, and which was only created through the common will of the Indonesian and Singaporean governments. As a result of this, the trajectories and rhythms of integration of these two transnational spaces are increasingly diverging. That of the Malacca Strait, which was historically in advance of the regional integration of the GMS, is no longer making any tangible progress. The risk for the countries of island Southeast Asia might well be the shift in the centre of gravity of ASEAN: Indonesia, Malaysia and Singapore were the founding members of ASEAN, but the most dynamic and concrete current processes of regional integration are taking place in the continental part and are marginalising the insular part;

- The multiplication of projects and lack of coordination (Fau, 2014b). It may also be asked whether or not the multiplication of sub-regional projects risks weakening ASEAN unity in the long term. Thus, while the ADB is a first mover in the projects for the GMS and the growth triangles in the Malacca Strait, it is surprising to remark that the articulation of these two transnational projects has never really been thought about; a Kunming-Singapore axis is at most envisaged under the initiative of China. However, these two projects might compete with each other; thus the project for oil and gas pipelines linking the port of Kyaukphyu in Myanmar and Kunming in China is directly aimed at short-circuiting the passage through the Malacca Strait that was until now almost obligatory;

- The growing weight of China in the construction and financing of the GMS. According to Geoff Wade (2010) the development of land transport networks does more to improve connectivity between mainland Southeast Asia and China than intra-Asian connectivity. There is even the risk that in the long term this would lead to a division of Southeast Asia's maritime and continental parts as long as the influence exercised by the southern Chinese provinces over the countries of the GMS continues to increase. Can we thus differentiate between a mainland Southeast Asia that would be in China's orbit and a maritime Southeast Asia that would be more independent? The China-ASEAN Maritime Cooperation Fund should allow the financing of port infrastructure projects and also of research programmes into the maritime environment and fishing and collaboration projects concerning the safeguarding of the South China Sea and the Malacca Strait.

National Scale: the Unequal Involvement of States in the Development of Corridors

The corridor development programmes assume that the ASEAN connectivity plan has been accepted with the same enthusiasm by all the countries of the region. However, the MPAC does not find the same reaction everywhere and although some governments see here a new opportunity
to be grasped, others see a real threat. Beyond the superficial consensus about the necessity of improving connectivity within ASEAN, we can measure the involvement of different governments by analysing the degree of adaptation of the planning policies of MPAC countries (Fau, 2014b). According to the precise case studies carried out by the researchers of the “Transnational Dynamics in Southeast Asia, the Greater Mekong Sub-region and Malacca Straits Economic Corridors” project, three types of countries within ASEAN may be distinguished:

**Type 1: discrepancy between the ADB’s plans and national plans.**

Malaysia and Indonesia have introduced economic corridor projects without taking into account those proposed by the ADB. Although the very definition of the corridors proposed is quite similar to the one exposed by the ADB, namely infrastructure axes that link growth poles (industrial clusters or special economic zones) between them and attract investment, their limits and aims are, however, very different (Charras, 2014). Although the ADB favours transnational dynamics, the Indonesian and Malaysian governments prefer national integration.

**Type 2: merging of ADB’s plans and national ones.**

This positive merger is mainly found in the continental part and is particularly efficient in the development policies of these border zones. Let us note that this merger does not only go one way, that is to say not only by the simple implementation of the Bank’s directives by the partner States, but by a real concerted dialogue.

**Type 3: regional integration is more important than national integration.**

This only concerns Myanmar (Vignat, 2014). In order to gain international legitimacy and to circumvent the economic sanctions imposed by the West in 1997, the junta in power until November 2011 multiplied bilateral and multilateral cooperation agreements. The projects implemented since the beginning of the political opening up in 1988 have placed Myanmar at the centre of the reconfiguration of the transport systems between South Asia, Southeast Asia and China and of regional energy challenges. They have, however, only been envisaged secondarily as a tool to unify and construct a national territory, but which is still dominated by armed conflicts in its peripheral regions.

**National Powers/Local Powers: Perceptions of Transnational Integration that are Often Very Different**

In theory, most East and Southeast Asian countries have committed themselves since 1990 to a decentralisation process aiming to install this “good governance”. In practice, whether it is in former communist countries, in highly centralised States (Indonesia, Thailand), or even in States that have a federal structure (Malaysia), the central government remains unavoidable and the on-going processes of transnational integration are very far from weakening them and, on the contrary, underline their still quite substantial weight in all political decision-making. However, at the end of our collective work, three types of relationship between national and local powers appear in the management of cross-border areas (Fau, 2014b):
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- The first, and most frequent, is the opposition between a national government that holds back the process of transnational and cross-border integration, in spite of the many agreements signed, and a local government that would like, on the contrary, to strengthen these dynamics. The reticence of the central government may be explained either by fear of the development of centrifugal forces on the periphery of national territory – as in the case of Indonesia or in the south of Thailand – or by unresolved disputes such as those between China and Việt Nam or Malaysia and Singapore. This opposition is often the reflection of very different perceptions of the border between local and national players. Where the local government thus sees, in the burgeoning economic relationship with its neighbour, an opportunity to be seized in order to boost the economic development of its province, the central government perceives a threat and a risk for the country’s domestic security,

- The second, which appears to be the least problematic, is the convergence of points of view between local and national governments. This convergence may even favour the implementation of joint investments. Even in this case however, the initiative of cross-border development remains in the hands of the central power;

- The last type is the opposition between a central power that pushes for regional integration and a local power that is against it. This problem is addressed in only one case, that of Myanmar. There has been opposition - sometimes violent - from the population and armed ethnic groups to the main projects implemented by the Burmese government in the framework of its regional integration policy. Threatening foreign investment is a way for the armed groups to put pressure on the government and also to contest a national policy that is being implemented without any consultation with local populations who are, however, directly affected by the implementation of these projects.

This typology does, however, only give a partial answer to the question concerning the impact of these transnational dynamics on local communities. Indeed, whether it be researchers from the Transiter group or the numerous studies carried out concerning this issue, they underline the multiplicity of factors to be taken into account to analyse the impact of a road construction on the local society. Vanina Bouté (2014) thus shows, in her study focusing on the social differentiations induced by the construction of road 3 in the north of Laos, that all populations are not in a position to benefit from the road because of increasing land pressure and the large size of the initial investment. Only traders and civil servants, that is to say the local urban elite that is already well established, have been able to invest in the purchase of rubber plantations and thus benefit from the impact of the North-South economic corridor crossing through the province of Luang Namtha, while the new farmer migrants from the highlands have become impoverished.

Conclusion

The main objective of this presentation and the following workshop is to show that there is no mechanical effect from the growth of transport flows on economic development, and this is the case on all scales. A corridor may facilitate trade, but if there is neither production to export, nor a market, it then remains a simple transport axis, nothing more than a penetrating route. Of course,
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without transport there is no trade, but trade also depends, and sometimes above all, on many other factors: the production capacities of different areas, production costs, tariff and regulatory barriers, the specificities of demand, etc. The construction of infrastructures only offers new possibilities, but the reality of their economic impact depends on many factors: the strategies of international organisations such as the ADB, the policies implemented by national governments, and even the ability of local populations to adapt. It is also necessary to emphasise that the construction of new infrastructures may even have a negative role in territorial development. Indeed, isolation protects areas from competition and, consequently, if accessibility improves, competition increases.

A second point concerns the possibility of duplicating development models, whether it be those of corridors or those of special economic zones at borders. This will be addressed in the workshops. Without adaptation to the local conditions, this duplication is often condemned to failure. Thus, the ADB projects to implement economic corridors linking the two sides of the Malacca Strait appears to be the clumsy and ill-adapted transposition of tried and tested tools within the GMS. The studies carried out by the ADB, and also by researchers such as Eswaran (2008) and Banomyong (2014), have shown that in the Malacca Strait, the performance of maritime corridors are always less than those of land corridors. However, this relative weakness of maritime corridors, which is very far from signifying an absence of flows between the two sides, reveals in fact the lack of relevance in using “economic corridors” to assess the quality of connectivity within the Malacca Strait. For example, in any strait, maritime flows are multi-directional and do not follow a single route and the non-conventional flows (fishing, barter, trade, traffic, etc.) are clearly greater than the simple flow of containers counted by the ADB.

One last point concerns the necessity of taking into account power stakes in the construction of transnational infrastructures. The term of “connectivity” used by the ADB allows us to turn a blind eye to these stakes by only focusing on technical considerations. The term “connectivity” used in the MPAC also does not seem to take into account the rising competition between the territories: the maritime liaison improvement plan between the ports of maritime Southeast Asia is certainly a means of encouraging better regional integration but nonetheless it almost ignores the major role of maritime companies, which decide alone whether or not to dock in a port, and the growing competition between ASEAN ports to capture international flows.
References


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1.4. AFD and the Fight against Climate Change

Rémi Genevey, director of AFD in Việt Nam

Climate change is now an essential part of any public policy for development aid, as it also is for any investment and inclusive growth policy in developing countries. The links between climate change and economic and social development, particularly in emerging countries, are now all too evident. The acceleration of global warming will have a long-term negative impact on development. Over the last ten years, the action of AFD, which is part of the French cooperation policy, has considered climate change to be a priority action area in developing countries.

1.4.1. AFD and the Fight against Climate Change

In the eyes of AFD, a “climate” project consists of a development project that has positive repercussions on the climate, that is to say when the reduction in the greenhouse gas emissions (GHG) engendered from the project is more than the emissions that it generates over its lifespan (“mitigation” component) and/or when it allows us to limit the vulnerability of properties, people and ecosystems to the impacts of climate change (“adaptation” component).

AFD’s Policy Regarding Climate Change

AFD Group has set itself some ambitious goals in its contribution to the fight against climate change. From 2012 to 2016, AFD has pledged that at least half of its financial commitments over this period will present “climate co-benefits”, that is to say that they will contribute to the reduction of GHGs or allow the beneficiaries of the projects to take measures against the undesirable effects of climate change. PROPARCO, a branch of the AFD that is devoted to funding the private sector in developing countries, has set itself the target of 30% “climate” projects.

This overall objective is modulated at the geographical level to strengthen this requirement in the large middle-income countries that are already set to become the biggest emitters of GHGs, because of the effect of their demographic and economic growth.

Thus, for Asia and Latin America, which are faced with big challenges as far as climate change is concerned, the AFD has set a target of 70% “climate” projects, compared with 50% in the Mediterranean zone and 30% in sub-Saharan Africa.
A Systematic Assessment of the Impact of Projects

For AFD, the fight against climate change goes beyond the discourse of administrative rhetoric and we wanted the projects that we fund to be subject to a systematic assessment of their environmental impact. This assessment is carried out using an instrument conceived by the ADEME[^27] called the Carbon Footprint.

This measuring tool, which allows us to determine the “carbon dioxide equivalent” quantity emitted by a project, classifies the projects into several categories: the above-mentioned “climate projects”, which aim to reduce emissions, the “emitting” projects that produce more than ten kilotonnes of CO₂, and the “very high emitting” projects which discharge more than a million tonnes of CO₂ a year.

This method, chosen by AFD, has been widely tested and adopted by many enterprises and administrations. This carbon footprint-measuring tool allows us to measure the impact of 27 types of different projects. AFD has adopted an active approach in the evolution of the techniques and know-how related to the measuring of carbon footprints and is a stakeholder in the working group of financial development groups aiming to harmonise carbon balance practices.

The Selection Policy for AFD Projects

AFD’s ability to finance emitting projects depends on the country’s level of development and the climate policies that are, where applicable, put in place.

For “Category 1” countries, including the least developed countries (LDC) – priority poor countries and countries in crisis – the prospect of AFD financing is important, as it is likely to give its support to GHG mitigation projects or projects with an inconsequential environmental impact but also GHG emitting, even very high emitting, projects. In the case of the latter, if the aid is concessional, this concessionality will only be transferred to the final beneficiary if the country has put in place a climate policy judged to be acceptable.

For “Category 2” countries, which notably include middle-income countries, AFD is able to fund mitigation or inconsequential impact projects and emitting projects. It does not fund, a priori, high emission projects, unless the country has put in place a climate policy that is judged to be acceptable. In Việt Nam, which is a lower middle-income country, AFD will only fund very high emitting projects if the country continues to implement its climate road map.

Finally, for “Category 3” countries with a “Green and Inclusive Growth” mandate (rapidly growing or emerging middle-income countries, notably in Asia, Latin America and the Caribbean), AFD will finance mitigation or inconsequential impact projects as well as emitting projects if the aid is not subsidised by French public money. If the aid is concessional, it will also fund this type of project on the condition that the country has an acceptable climate policy. High emitting projects are not funded.

### Table 11. Selection Policy of AFD “Climate” Projects

<table>
<thead>
<tr>
<th>Tier 1 (SSA, least developed countries, priority countries)</th>
<th>Tier 2 (Middle income countries)</th>
<th>Tier 3 (CVS countries)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigation projects &amp; negligible effect projects (between -10kt CO₂/year and +10 ktCO₂/year)</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Polluting projects (between 10kt CO₂/year and 1 Mt CO₂/year)</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Strongly polluting projects (more than 1Mt CO₂/year)</td>
<td>YES If the aid is concessional, this concessionality is not handed over to the final beneficiary unless it has an acceptable policy on climate change.</td>
<td>NO unless the country has implemented an acceptable policy on climate change.</td>
</tr>
</tbody>
</table>

**Note:** t eq CO₂: equivalent ton CO₂; Kt CO₂: kilo ton CO₂; Mt CO₂: millions of tons of CO₂; CVS mandate: “Green and Inclusive Growth”; “SSA”: Sub-Saharan Africa.

*Source: Author’s construction.*

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**Climate Activity of AFD Group in 2014**

**Geographical Distribution and Financial Commitments**

In 2014, the "climate" loans granted by AFD represent 85% of aid allocated in Latin America, 71% in Asia, 53% in the Mediterranean basin, and 30% in Sub-Saharan Africa. These figures even go beyond the goals set for the period.

In financial terms, “climate” commitments reached EUR 2.9bn in 2014[28] of which EUR 145m were committed in the form of budgetary and sectoral aid, EUR 413m in the form of adaptation commitments, and EUR 2.4m in the form of mitigation commitments.

[28] Since 2005, it has contributed more than EUR 18bn for this purpose.
**Typology of “Climate” Funding Granted in 2014**

This typology is based upon two complementary approaches: those aiming to reduce greenhouse gas emissions, the mitigation approach, and those aiming to reduce the vulnerability of socio-economic and environmental systems and increase the global resilience of the economy and society, which constitute the “adaptation component”. Adaptation alone is not desirable, in so far as it would constitute merely a “stopgap measure”, which falls short of the challenges linked to climate change. It must be combined with strong-willed mitigation policies.

**Climate Change Adaptation**

Adaptation is based upon a simple principle: past emissions of greenhouse gases will have inescapable future consequences linked to the high persistence – several decades and even more – of greenhouse gases in the atmosphere. It is thus not only necessary to start protecting ourselves right now from future damage but also to capitalise on the potential advantages of these new climatic conditions by adjusting our socio-economic systems. The goal of adaptation policies may also be interpreted as the avoidance or reduction of the potential future costs of climate change (Mansanet-Bataller, 2010).

AFD’s commitments in favour of climate change adaptation, which were traditionally dominated by the conservation and management of water resources, have changed over the years to the benefit of issues concerning extreme climatic risk management: the fight against the risk of floods in the urban environment, via the construction or renovation of rainwater drainage systems in Sub-Saharan Africa or in Asia.

The funding of projects promoting agricultural practices that are adapted to the impacts of climate change, as well as actions to preserve the natural capital of the most vulnerable countries, have nevertheless represented 44% of the number of AFD Group-funded projects having adaptation co-benefits.

In 2014, 53% of AFD’s climate change adaptation funding went to projects related to the management of extreme climatic risks, 28% to water resource management related projects, and 19% to agricultural or biodiversity conservation projects.

The total amount of this type of funding represents EUR 413m. Geographically, Sub-Saharan Africa is the priority beneficiary, constituting 45% of this funding. Although Asia remains the second biggest beneficiary, the amount of funding is decreasing in this region.

**Climate Change Mitigation**

Mitigation is based upon another simple principle: as the current climate change is the result of the accumulation of greenhouse gases in the atmosphere, it is necessary to reduce emissions and encourage their storage in natural carbon sinks such as forests. This type of action may be undertaken anywhere on the planet: its impact on the average concentration of greenhouse gases in the atmosphere will be worldwide.
Funding mitigation projects now will allow us to avoid future climate change adaptation expenses that will be far higher.

In 2014, support for renewable energy and the energy sector represented a quarter of AFD Group’s “mitigation” activity, notably thanks to the funding of sixteen credit lines to local banks in Kenya, Indonesia and Latin America, which allowed it to promote better procedures and practices, which benefitted enterprises that it could not directly address.

The significant rise in the direct funding of renewable energy projects has been reflected in the support AFD has given to several projects aiming to increase the production capacity of solar or wind energy.

Projects aiming to promote energy efficiency funded by AFD notably consist in the modernisation of transport and electricity distribution networks in Africa and Asia.

Public transport projects continue to represent nearly a third of mitigation commitments – subways in Hà Nội, Lima, Bangalore and Santo-Domingo.

Solid waste disposal investment represents EUR 51m.

The “biological carbon sequestration” sector principally covers support for sustainable forest development in the Congo basin and in Southeast Asia.

The total sum of AFD mitigation funding represents EUR 2.4bn. 35% of the Group’s commitments in favour of mitigation have been granted to Latin America, notably in the form of credit lines to local and regional development banks. The mitigation activity has tripled in the Mediterranean, as it also has in Sub-Saharan Africa. It is also progressing in Asia where several energy credit lines have been allocated to local banks.

**Climate Funding Instruments**

AFD Group provides developing countries with its full range of financial instruments, depending on the needs and level of development of the beneficiary country.

Two-thirds of the Group’s “climate” activity has been financed by concessional, sovereign and non-sovereign loans, which represent a total sum of nearly EUR 2bn. Funding by non-concessional and non-sovereign instruments remains stable at 16% – EUR 464m.

In 2014, there was a marked rise in grants devoted to the funding of “climate” projects, particularly thanks to the growing mobilisation of external resources delegated to the AFD (notably by the European Union).

Finally, budgetary funding in 2014 was mainly devoted to supporting “climate” policy in the city of Johannesburg and the granting of the fifth tranche of funding of the “Support Programme to Respond to Climate Change” in Việt Nam.

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[29] Sovereign credit is credit granted to a State or backed by this State. Non-sovereign credit, other than in the private sector, is credit granted to a public enterprise or a decentralised community, without the backing of the borrower’s State.
AFD and Preparation for the COP21

Paris is getting ready to host the 21st United Nations Climate Change Conference (COP 21) in December 2015, the biggest since the failure in Copenhagen. This meeting brings both hope and uncertainty. Faced with big challenges, and by virtue of its role as host, France is deploying the necessary efforts for the success of COP21. In accordance with the services of the French Ministry of Foreign Affairs, AFD has been entrusted with, in the countries where it operates, a key role in the subject, in partnership with the diplomatic services. Thus, it is in charge of doing its utmost to prepare the conference by carrying out awareness-raising missions beforehand, in each country, in order to obtain the best possible contributions from emerging countries, the common goal being to contain global warming below the limit of 2°C.

The preparation for COP 21 and the effective implementation of contributions present challenges for emerging countries faced with the issue of climate change and the necessities induced by economic growth and the requirement of inclusive social development. This difficult conciliation requires AFD to make a supplementary investment in emerging countries, which are themselves in need of expertise and funding for projects compatible with their commitments and the requirements of “green growth”. AFD must thus include these future needs in its medium-term strategy, in accordance with the strategic orientations determined by France.

The year 2014 demonstrated worldwide advances in climate change funding. The Green Climate Fund, which sanctioned the realisation of a long process that began at the COPs in Copenhagen and Cancun, is called upon to play a catalysing role in large-scale actions for mitigation and adaptation. It will become the cornerstone of funding architecture in the fight against climate change, of which the needs are estimated to be USD 100bn a year.

France quickly showed its support for the Green Fund and has played an active role in its capitalisation, which has reached EUR 9.3bn. AFD, for its part, has obtained its accreditation from the Green Fund as a financial intermediary for the implementation of these UN Funds, which demonstrates the confidence placed in its renowned know-how.

This progress is the proof of a long-term change in the global architecture of development aid, which has been called upon to focus on the environment and climate change. AFD and France consider it essential to adopt a comprehensive and integrated approach to development and the fight against climate change that can be seen in “greener” national development aid policies. This approach that promotes the defining and implementation of new development strategies, which are low-carbon and resilient to climate change, also entails better coordination between donors.

The setting, under the aegis of the UN, of Sustainable Development Goals (SDGs) to succeed Millennium Development Goals, by combining climate and development “agendas”, confirms the pre-eminence of climatic challenges, not only in the global policy to support countries of the South, but also in the economic policies of developed countries, as these SDGs will guide public action throughout the world.

The preceding developments demonstrate AFD’s proactiveness in the worldwide shift towards this new architecture of aid.
1.4.2. AFD and the Fight against Climate Change in Việt Nam

AFD has been present in Việt Nam since 1994 and has financed more than 80 projects for a total sum of EUR 1.6bn. This long-term presence has allowed AFD to adapt its offer of funding and expertise over the years, in accordance with the evolution of the Vietnamese economy and society. Although Việt Nam is today experiencing steady growth, it is confronted by the challenge of “green growth” and appears to be particularly vulnerable to the effects of climate change. Consequently, AFD’s climate action in Việt Nam is being called upon to grow significantly over the next years.

Việt Nam in the Face of Climate Change

Việt Nam has over 3,000 kilometres of coastline, and two big densely populated deltas that are the country’s economic pivots, which make the country particularly vulnerable to climatic phenomena, particularly to sea level rise. A rise in sea level of one metre would affect nearly 5% of the country’s land and 11% of the population. Seven percent of agricultural land is likely to be affected, which would have a negative impact on the gross domestic product (GDP) of about 10%, as agriculture remains a pillar of the Vietnamese economy.

These phenomena are thus of a nature to jeopardise an emerging economy with stable growth, which would penalise human development in the long term. The different studies that seek to define a synthetic vulnerability index conclude that Việt Nam figures among the fifteen countries that are the most vulnerable to the various consequences of climatic upheavals. However, the last report by the Working Group of the Intergovernmental Panel on Climate Change (IPCC) foresees a rise in sea levels, considering all possible scenarios, of 29 to 82 cm between now and the end of the 21st century (2081-2100) (IPCC, 2014).

Although Việt Nam may well suffer from the effects of climate change, it remains a modest contributor to greenhouse gas emissions. Out of the nineteen biggest polluters in Asia, and with the exception of China that emits more than 9,000 million tonnes of CO2 each year,[30] Việt Nam is the eighth biggest polluter, just behind Malaysia. These emissions are mainly from industry and agriculture. Although gross per capita emissions are still low, the carbon intensity of the economy – emission of GHGs per unit of GDP – is high: the high economic growth is partly the result of highly polluting procedures and this parameter could worsen further in the future owing to the rising demand for energy that will be mainly satisfied by coal-fired thermal power plants; Việt Nam has mobilised its hydraulic potential but has not, however, prepared itself for the development of renewable energies (sun or wind) through a well-adapted energy policy and pricing.

The Vietnamese economy’s heavy dependence on “dirty” primary energies involves progressive transition towards “greener” procedures in order to not suddenly brake its growth and development. However, Việt Nam must as of now include the “carbon issue” in the medium and long-term evolution of its economy.

[30] China’s growth in annual emissions is more than the annual emissions of France.
The Commitment of Việt Nam in the Face of Climate Change

Việt Nam has become aware of profound climate change and has adapted its administrative, legislative and regulatory system to take on the challenge. The Vietnamese government began by ratifying the United Nations Framework Convention on Climate Change (UNFCCC) on 16th November 1994, as well as the Kyoto Protocol on 25th September 2002.

In December 2008, Việt Nam adopted the "National Target Program to respond to Climate Change,"[31] a text that constitutes the framework for strategic climate intervention in the country for the period to 2015. This was followed by the approval of the national strategy for the fight against climate change,[32] the national plan of action against climate change for the 2012-2020[33] period, and the national green growth strategy,[34] which fixes reduction as a priority strategy between now and 2020, from 8 to 10% of the CO₂/GDP emission ratio (emission intensity ratio) in relation to 2010 and energy intensity by 1 to 1.5% per year (energy consumption per GDP unit).

The "Action Plan for the National Green Growth Strategy" is currently being approved by the Prime Minister. This strategy aims to reduce emissions from the energy sector by 10 to 20% in relation to the "business-as-usual" scenario that is currently in the process of being defined.[35]

[31] Decision n°158/2008/QĐ-TTg by the Prime Minister.
[33] Decision n°1471 of 05/10/2012.
[34] Decision n°1393 of 25/09/2012.
[35] At the date of this presentation at the JTD 2015. Since then, Việt Nam has produced its voluntary contribution (INDC: intended nationally determined contribution) that states an unconditional commitment to reduce GHGs by 8% between now and 2030, and by 25% with international financial support.
AFD and the Fight against Climate Change

The “Climate” Balance Sheet of AFD’s Activities in Việt Nam (2006-2014)

This balance sheet is characterised by commitments and concrete results. Over the 2006-2014 period, AFD committed EUR 471m to 16 development programmes and projects that were part of the fight against climate change or adaptation to its impacts.

Under the funding of “climate” mitigation projects, the emission of 1.18 million tonnes of CO₂ per year will be prevented in Việt Nam in the transport and energy sectors. As for the adaptation component, AFD is greatly involved in the domain of agriculture and water management (irrigation, fight against floods).


Mitigating the Impacts of Climate Change in Việt Nam

Huội Quảng Hydroelectric Dam

AFD has funded the Việt Nam national electricity operator (EVN) for the development of the hydroelectric plant in Huội Quảng whose typical power output will be 520 MW. The watering of the dam is scheduled for December 2015. AFD funding concerns the dam’s electromechanical equipment, works and the expertise of two panels of experts.

The project’s carbon footprint has revealed that it will result in a reduction of 1,120,000 t eq. CO₂ per year during its operation over the coming decades. In relation to the project’s cost, this works out at
USD 10.5 (EUR 8.1) of savings per tonne of CO₂ equivalent, which is relatively low in relation to similar projects – the normal range for hydroelectric projects is from EUR 6 to EUR 15 per tonne.

Furthermore, this project will relieve the Vietnamese economy that has a great need of electricity (+10% per year) and which, in its present state, was unable to cope with demand or to reduce its energy dependence vis-à-vis neighbouring countries.

The Vietnamese government has set itself the goal of reaching, in 2020, a total capacity of 80 GW – that is to say an annual need of investment of between USD 3bn and USD 4bn. To do this, the country is building thermal power stations and intends to develop a nuclear power industry, but is also promoting the development of renewable energy. Hydropower is an essential resource in this regard and it represents a large part (32%) of the national electricity production. AFD chose hydropower – a renewable, sustainable and cheap source of electricity – to help Vietnam meet its needs.

Finally, in order to mitigate as much as possible the negative impacts on the local environment and the affected populations, EVN is implementing a social and environmental management plan. A panel of independent experts – the French firm ARTELIA – regularly visits the site to monitor the implementation of these risk mitigation measures. Thus, the effects on water, animal and vegetable biodiversity, and the impact of the sites will be monitored. Nearly 900 families are being or will be rehoused. They are receiving financial compensation for the loss of their old plots of land and houses. Beyond this, the project also aims to accompany the local population for the change in their life. The challenge is to restore the incomes of families who have lost their rice fields or other crops, with new activities, such as forest management, and fish farming on the dam’s future reservoir. This project will have positive social effects: the electricity supply will principally benefit industry and trade, which will lead to the creation of jobs as well as a reduction in the poverty and vulnerability of the poorest rural populations.

Modernisation of the “Yên Viên – Lào Cai” Railway Line

The railway network in Việt Nam covers around 3,100 km. Most of it was built at the beginning of the 20th century and was damaged during the war, this damage concerned tracks but also bridges and tunnels. The partition of the country for twenty years also resulted in different methods of development and exploitation.

The backbone of this network is the Hồ Chí Minh City-Lào Cai (Chinese border) line. The railway rehabilitation project concerns this strategic axis that links the outskirts of Hà Nội to the city of Lào Cai. Investment has remained low in this sector and spending has been mainly concentrated on maintenance. The development of the railway sector in Việt Nam appears to be a necessity to satisfy a growing demand for medium and long distance transport, particularly for freight, and rail transport not only has a certain legitimacy from an economic point of view, but also helps regional integration. The use of railways also allows us to reduce greenhouse gases, hence the challenge to build a high quality public transport system with developed interoperability.

The total cost of the project came to USD 160m. It was co-funded by AFD for an amount of EUR 32m, by the Asian Development Bank (ADB) for USD 31m and the Directorate General of the Treasury's
Emerging countries reserve (DG Trésor/RPE: Direction Générale du Trésor - réserve de pays émergents) for EUR 31m. The Vietnamese government completed the financing with a sum of USD 22.5m.

At the environmental level, this project will result in a reduction 40,000 tonnes of CO₂ emissions per year thanks to the transfer from road to rail of 550 million tonnes-km, between now and 2020.

Construction of Line 3 of the Hà Nội Subway

Over the last twenty years, the big Vietnamese agglomerations have experienced steady urbanisation and socio-economic development. In Hà Nội, the predominance of motorbikes (3.7 million two-wheel vehicles, or 600 motorbikes per 1,000 inhabitants, 78% of Hanoians’ journeys are done on motorbikes), coupled with the recent growth in the number of automobiles, has resulted in many negative impacts, as much in terms of congestion and road safety as in public health. In an effort to address these issues and control the effects of pollution, public health and loss of productivity, the municipality has committed itself to building a subway network of which the funding of the pilot line has been entrusted, among other donors, to AFD.

AFD is participating more precisely in the funding of the subway line 3, Nhổn-Hà Nội railway station, which is considered to be the “pilot-line”. This line, which is 12.5 km long (8.5 km above ground and 4 km underground), is scheduled to enter into service in 2015 and will be extended to 21km in 2020, then 33km and 48km in 2030.

The goal of the city of Hà Nội’s master plan is that, between now and 2020, one out of two journeys will be carried out using public transport.

In general terms, the development of urban public transport will underpin economic growth and the productivity of urban activities, increase the mobility of populations, improve their access to health care and education, and their integration into economic life (particularly women who have less access than men to their own means of transport, and the poorer populations) and finally, contain urban pollution and improve inhabitants’ living conditions.

The Hà Nội line meets the requirements of AFD’s transport guidelines: better management of urban congestion and greenhouse gas emissions and a multimodal approach. The Nhổn-Hà Nội railway station subway line will accommodate 157,000 passengers per day when it enters into service in 2018, 428,000 in 2020, and, after further line extensions, 750,000 in 2030.[36]

The Nhổn-Hà Nội railway station line will result in the saving of 20,000 T eq. CO₂ between 2010 and 2030. According to studies financed by the French Facility for Global Environment (FFEM: Fonds Français pour l’Environnement Mondial), the development of public transport in the city of Hà Nội should halve local polluting emissions by 2020. Energy consumption would thus be reduced by 30%.

AFD is financing this line with EUR 170m of loans and with a EUR 0.5m grant, co-financed with the Emerging Countries Reserve (RPE: Réserve Pays Emergents), the French Ministry of Economy and Finance, the ADB and the European Investment Bank (EIB). This project also benefits from a

[36] Like all especially built public transport sites in Việt Nam, line 3 of the subway is experiencing delays that should delay the commissioning schedule for about two years.
subsidy of EUR 1.27m grant from the FFEM. The contracting authority, the municipal service Hà Nội Metropolitan Rail Transport Project Board (MRB), has, for its part, called upon the French group Systra for the engineering of the line.

Adapting to the Effects of Climate Change in Việt Nam

AFD adaptation funding in Việt Nam concerns three principal domains: water resource management and irrigation improvement, protection against floods and access to drinking water.

Climate change is likely to have an effect on water resources through a change in natural phenomena (droughts and floods), and a decline in the quality of drinking water. In the same way, and beyond water resources, the whole of agriculture could be affected by climate change (floods, groundwater pollution, subsidence and soil salinisation). Apart from the economic consequences of these phenomena, the most vulnerable populations (the poor, agricultural, rural) are likely to be affected. The goals of funding these climate change “adaptation” projects are thus to anticipate the negative consequences of climate change on the Vietnamese economy while at the same time preserving the interests of the most vulnerable populations.

Management of Water Resources and Improvement of Irrigation

In the North, AFD has been a partner in the funding of the “Bắc Hưng Hải Water Station” project that is centred on the management of water resources in the Red River delta. The Red River forms the backbone of North Việt Nam. With its tributaries, it ensures the irrigation that is indispensable to rice cultivation and constitutes the principal waterway between the Gulf of Tonkin and southern China. But the Red River is also responsible for many natural disasters. 30 million Vietnamese live under its constant threat – 20 million in the delta zone. This river flows through Hà Nội and Hải Phòng, two of the three most populated cities in the country, and its delta represents more than a quarter of the country’s GDP and 20% of national rice production.

We can thus add to the meteorological dangers the current and future consequences of climate change. An increase in one degree to average temperatures would decrease the annual rice harvest in the basin by 10%. Half the land in the delta is lower than two metres high and is thus directly threatened by sea level rise. Furthermore, the construction of upstream hydropower dams – on the other side of the Chinese border – disturbs the Red River in Vietnamese territory. Growing urbanisation, finally, modifies rainwater runoff and increases the risks of floods. In the Red River basin water is everywhere, but it is not well distributed.

The “Bắc Hưng Hải Water Station” project aims to improve irrigation in the region concerned. In the programme figure: the construction of eight new pumping stations and the renovation of two existing ones. The surface area of cultivated land (drained and irrigated) should double to reach 10,000 irrigated hectares.

In Central Việt Nam, the AFD is participating in financing of the “Ninh Thuận” project. The province of Ninh Thuận is one of the poorest and driest in Việt Nam and its principal activities remain agriculture and trade in sea produce. In order to compensate for the difficult natural conditions and improve those of agricultural production and therefore of smallholder farmers, the province has envisaged
a mobilisation of water resources plan through a series of water retaining dams and a distribution network of open-air gravity-fed canals, as well as a development plan for road infrastructures, and has approached AFD for help to fund part of the work. The project has seen the construction of five hydrological works on the tributaries of the Cái River. These works, which are constituted of small dams and canal networks, have allowed the irrigation of new cultivated land and the implementation of two to three cycles of crops in the concerned zones. Apart from the development of these infrastructures, the project also foresaw institutional support for the province’s hydrological works company in order to ensure a participatory management of irrigation and an outreach effort to the beneficiaries of the works, so as to favour agricultural diversification and the securing of farmers’ incomes. An irrigation fee system has also been introduced to ensure the maintenance of the works in the best possible conditions.

Finally, in the South, in the Mekong delta, AFD is participating in the “Phước Hòa” project, in a river basin facing many challenges such as the sharing and distribution of its resources, intrusion of salt water, irrigation and urban and demographic growth that is disturbing it ecosystem. Using an integrated water resources development approach, the major goal of the project is to increase agricultural production, in the framework of the sustainable and efficient management of water resources. The crops cultivated in the zone – mainly rice – will give greater yields thanks to greater and more efficient irrigation. The development of the participatory management approach to irrigation infrastructures will result in giving more responsibility to local actors and improve water efficiency.

Protection Against Floods

Between 2006 and 2014, AFD action in this domain focused on the “Sài Gòn River” project and the “Central Region Urban Environmental Improvement Project” (CRUEIP).

The first project consisted of the construction of dykes along the Sài Gòn River and the main canals linked to it. They protect the Bình Dương province from floods, on the left bank, and that of Hồ Chí Minh City, on the right bank. The project also concerned the installation of floodgates to control water flow, the repair of the irrigation canals (which makes it easier for water traffic on the larger ones) and the road network (building of bridges, widening of roads). The project has furthermore involved the training of Vietnamese officials in “integrated water resources management” (IWRM). In January 2011, a visit to France was organised to study the management methods of the Seine and Rhone Rivers and build a Franco-Vietnamese partnership on the issue of the management of flood risk.

AFD’s action will lead to the reduction of downstream salt water in the Sài Gòn and Vàm Cỏ Đông Rivers, as well as the reduction and more efficient control of flood risks.

The “Sài Gòn River” project, at a total cost of EUR 30.8m, began in December 2006, for an initial period of four years. It was finally completed in 2012. AFD’s funding totalled EUR 11.5m, in the form of a loan. The project also received a EUR 350,000 grant.

As for the CRUEIP project, it aims to reduce rural migration towards the big urban centres in the North and South by strengthening the attractiveness of medium-sized cities in the provinces of
the Centre. The sites funded by the project had the goal of improving the inhabitants’ quality of life in these agglomerations and, indirectly, promoting local economic development. In the field, the CRUEIP project has resulted in a multitude of sites, notably the drainage of storm water (the laying of more than 80 km of drains for the whole project), the construction of flood protection dykes, like those in Tam Kỳ, over a length of 7 km for the whole of the project, the digging of storm water management ponds in several city centres (total surface area of 40 hectares), and the construction of 15 km of sewers with the capacity to treat 3,500m$^3$ of waste water per day.

**Drinking Water supply – “AEP Mekong Programme”**

The delta’s coastal provinces are already affected by the upwelling of salt water. This phenomenon can be made worse by climate change. Operators are today obliged to go further and further upstream to collect fresh water because of the upwelling of salt water. This considerably raises investment costs and thus water production costs in these coastal provinces.

AFD’s action is aimed at the six following provinces: Trà Vinh, Cần Thơ, Bến Tre, Đồng Tháp, An Giang and Vĩnh Long. The programme aims to bring drinking water to households in the cities of the Mekong Delta that are not connected to distribution networks, to improve the service of those that already have access to drinking water, strengthen provincial water companies (PWCs) and develop a commercial approach to water in order to support a necessary investment policy in the sector.

In the field, the project has led to the construction and renovation of water treatment plants, the laying of new pipes, and the replacement of old ones. The programme is managed in partnership with the Việt Nam Development Bank (VDB) and is based on an innovative financing structure. The line of credit provided by AFD is financing a “water fund” that is managed by the VDB. Thanks to this project, 750,000 people, whose households are not connected to the network, will gain access to drinking water. A further one million inhabitants of the Mekong Delta will also see an improvement in the quality of service: better quality water, higher pressure in the network, tap water available 24 hours a day (which is not the case in certain areas), better customer service with the PWCs, etc.

**The “Support Program to Respond to Climate Change”, an Innovative Tool at the Service of Climate Policy in Việt Nam**

In 2009, AFD initiated, jointly with the Japanese cooperation agency (JICA), the “Support Program to Respond to Climate Change” (SP-RCC) in order to support the Vietnamese government in its implementation of its national strategy. Since then, other donors have joined the programme: the World Bank, the Canadian Cooperation Agency (CIDA), the Australian Cooperation Agency (AusAID) and the Korean Cooperation Agency (KEXIM).

The SP-RCC consists of annual budgetary aid backed by the implementation of a matrix of public policies, and the support of a dialogue between donors and Vietnamese ministries. This innovative approach has led to the implementation of a regular dialogue regarding all the sectors linked to climate change, the defining of priority actions and the articulating of the technical and financial support needs of the government.
AFD and the Fight against Climate Change

AFD particularly assumes the role of leading player for the “renewable energies” theme, actively contributes in discussions about energy efficiency and the implementation of a financial “climate” mechanism, and finally brings out its extensive experience in the field of rural development (irrigation, agro-ecology).

In addition to the SP-RCC, AFD supports the city of Đà Nẵng in the drawing up of its climate plan and accompanies the Ministry of Industry and Trade (MoIT) in the establishment of an “energy efficiency” road map in the steel sector. AFD organised experience-sharing seminars on the themes “tracking of climate expenditure” (12/2013) and “renewable energies” (05/2014).

**AFD’s Climate Outlook in Việt Nam**

In the framework of its country action plan 2016-2020 that is currently being drawn up, AFD intends to support Việt Nam in the transformation of its growth model so as to make it more sustainable and equitable. This goal has three major axes of action: promote sustainable and inclusive urban development, support the modernisation of the production sector with a large social and environmental impact, and accompany Việt Nam to face the challenges of climate change.

Through the mobilisation of financial instruments and the necessary partners, AFD will support a wide range of activities that contribute to the fight against climate change in Việt Nam: improvement of public services in urban areas, development of institutions and financial tools with a strong environmental impact, participation in structuring projects in the transport and energy sectors, water management and the prevention of floods, and, finally, support a shift in public policies (budgetary aid, sector-related dialogue, experience-sharing).

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1.5. The Control of Infectious Diseases in a Regional Context

Marc Choisy – IRD

The post-Second World War years are marked by the launch of ambitious programmes to control – and even eradicate – infectious diseases. The emergence and recent re-emergence of infectious diseases, as well as their increased resistance to medicines and insecticides, makes the issue of controlling infectious diseases more difficult than ever. To this may be added high population growth and increasingly intense movements of people over longer distances. This epidemiological globalisation makes it all the more necessary to coordinate the different policies to control infectious diseases in a regional context. To the inherent complexity of the spatial dynamics of infectious diseases may be added a socio-economic complexity that is characterised by different cultures, political regimes, epidemiological risks and extremely varied economic means in a relatively small geographical area. In such a context, only increasingly more detailed, integrated and realistic models will allow us to manage more efficiently tomorrow’s epidemiological problems. Such models can only be constructed if abundant, varied and high quality data are available. Epidemiological surveillance networks and socio-economic monitoring thus play an ever more crucial role not only to increase academic knowledge but also in their practical applications in public health.

1.5.1. Introduction

Epidemiology is the study of the variations in the number of diseases in time and space (Saracci, 2010). The birth of modern epidemiology dates back to the work of Dr. John Snow on the cholera epidemic that struck the area around Broad Street in London in 1854 (Hempel, 2013). On 31st August 1854, this London neighbourhood was struck by a large epidemic that killed more than 500 people in the space of only 10 days. At this period, a decade before the pioneering research work of Pasteur on germ theory, it was the miasma theory that prevailed, according to which diseases were propagated by a sort of “bad air”. Through meticulous research and the mapping of cases, Dr. Snow demonstrated that cholera was transmitted through the public water supply that mainly came from the same pump. Snow’s work established for the first time the transmittable character of certain diseases and thus marked the birth of the epidemiology of infectious diseases (Hempel, 2013). A few years later, the work of the German Robert Koch demonstrated that these diseases that were

[37] Terms defined in the glossary are written in bold letters when first used in the text.
said to be transmittable or infectious (as opposed to chronic diseases such as cancer, cardio-vascular diseases or genetic illnesses) are caused by living organisms such as viruses, bacteria, protozoa and parasites (Wainwright and Lederberg, 1992). We deal with infectious diseases here. Hereafter, the term “epidemiology” will refer, by default, to the epidemiology of infectious diseases.

Nowadays, epidemiology consists of several types of complementary activities (Saracci, op. cit.). The first of these activities is surveillance that consists of gathering the number of (new) cases present in a given place over a given period of time. The main goal of such tracking of the number of cases in populations is to detect epidemics as early as possible in order to control them as efficiently as possible. During the first three decades of the 20th century, the doctor Ronald Ross, winner of the Nobel Prize in Medicine in 1902, greatly contributed to the application of mathematical models in the study of the transmission processes of infectious diseases (Diekmann and Heesterbeek, 2000). These models allow us to understand transmission mechanisms better, and thus give us the possibility of making high quality quantitative predictions. Today, as well as being used to predict, these models are used for prospection in order to establish the most efficient control policies as possible (Anderson and May, 1992). This is a particularly important aspect of human epidemiology models where experimentation is impossible for obvious ethical reasons. Such models thus contributed to the efficient control of the 2014 cholera epidemics in West Africa (Fisman et al., 2014) and of MERS-CoV in 2015 in Korea (Cowling et al., 2015).

Here we are going to deal with the aspects concerning the surveillance and control of infectious diseases in a regional context, the difficulties and the solutions that are being applied. These two parts will be separated by a section on the spatial dynamics of infectious diseases. Finally, we shall finish with a short conclusion about future challenges, particularly in Southeast Asia.

### 1.5.2. Monitoring Infectious Diseases in a Regional Context

Surveillance of infectious diseases serves many different objectives (M’ikanatha et al., 2007). As well as the tracking of incidences and prevalence, surveillance also serves to identify the etiological agents when they are not known, to identify and quantify the risk factors and the modes of transmission. The tracking of incidences and prevalence naturally helps us anticipate epidemics and therefore to control them better. Thus the flu surveillance campaigns carried out in Asia greatly contribute to the development of vaccines against the flu (Bedford et al., 2015). Every season, the flu spreads across the world from Asia. As the flu virus mutates every year, it is necessary to adjust the vaccine against it each epidemical season (Treanor, 2004). The surveillance of the strains circulating in Asia allows us to thus gather crucial information for the development of the optimal vaccine for the whole planet. This example perfectly illustrates that surveillance implemented in a given place can benefit not only the public health of the local population but also that of other populations who may depend on this local population. Finally, the surveillance of infectious diseases also plays a crucial role in the assessment of the efficiency of control policies. The implementation of a surveillance system closely depends on the target objectives.

Once the monitoring goals have been identified, it is necessary to identify the spatial units for surveillance as well as to define the cases.
For the first aspect, it is particularly important that the surveillance effort is proportional to the size of the population being tracked, if not monitoring bias is introduced. This is a major difficulty when we want to establish a surveillance in several countries with different financial means. The other potential difficulty is linked to the defining of cases, particularly for viruses like dengue whose symptoms may vary greatly (Simmons et al., 2012).
Indeed, for the dengue virus, the definition of cases changes not only in space (according to country), but also in time (according to the means at hand to detect cases). This inconsistency makes it difficult to compile surveillance systems on large spatial and temporal scales.

Once the objectives, the spatial units and case definition have been defined, we may begin the actual implementation of the said surveillance network. This implies the gathering of data in the field, controlling their quality, and the transmission and aggregation of information (Mikanatha et al., 2007). Surveillance systems do indeed have a very hierarchical structure within which the data are sent from the lowest levels (health centres at the community level) towards the higher levels to eventually find itself centralised at the highest level (in general the Ministry of Health).
Diagram 4. A Complex and Hierarchical Structure of a Surveillance System: Example of Laos

Ministry of Health

Number of cases and Complete list of information deaths by disease and by province for each case

Departments of Health in each Province (n = 17)

Number of cases and deaths by illness and by province Complete list of information for each case Number of cases and deaths by illness and by district Complete list of information for each case Number of cases and deaths by illness and district Complete list of information for each case

Provincial Hospitals (n = 17)

Central Hospitals (n = 4)

District Health Departments (n = 130)

Number of cases and deaths by illness and by village Complete list of information for each case Number of cases and deaths by illness and district Complete list of information for each case

Health Centres (n = 620) District Hospitals (n = 130)

Weekly, through visits or fax

Weekly, through visits or fax

Weekly, through visits or fax

Weekly, through visits or fax

Weekly, through visits or fax

Weekly, by telephone

Monthly, through visits or fax

Source: Author’s construction.
At each level, the data are aggregated from all the lower levels and sometimes the information is simplified (calculation of averages for example), thus necessarily inducing a loss of information between each level. These transfers and summaries of information may be frequent sources of error. Quality control is thus necessary at each operation. The coherence of communication between the different hierarchical levels must be as clear as possible, to limit ambiguities as much as possible: who receives the information, who transmits the information, etc. (Beatty et al., 2010). The information flow within the network may be done using different media (paper, electronic files, web interface, mobile devices, etc.) and with different frequency.

Once the data have been gathered, aggregated and centralised, the data can be made secure and accessible for analysis. Whatever the means of gathering the data (on paper, electronically, etc.), the database’s final medium must be as homogeneous as possible. Nowadays, the most appropriate medium is an electronic database using a web interface both for entering and usage of the database (van Panhuis et al., 2013). The electronic database must be as secure as possible. Duplication of the database on several independent servers will ensure against any possible loss of data, against any computer breakdown or any other risks such as fire, floods or theft. If access to the database is restricted to just a small number of administrators, this will allow us to limit the risk of human error. Table 12 shows an example of incidence data that contain temporal and spatial data.

### Table 12. A Surveillance Database: Example of Dengue in Southeast Asia

<table>
<thead>
<tr>
<th>Year</th>
<th>Latitude</th>
<th>Z-scores of log10 IR</th>
<th>Normalised log IR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>6</td>
<td>-1.2</td>
<td>-1.3</td>
</tr>
<tr>
<td>1994</td>
<td>8</td>
<td>-0.8</td>
<td>-0.9</td>
</tr>
<tr>
<td>1995</td>
<td>10</td>
<td>0.1</td>
<td>0.4</td>
</tr>
<tr>
<td>1996</td>
<td>12</td>
<td>0.8</td>
<td>1.3</td>
</tr>
<tr>
<td>1997</td>
<td>14</td>
<td>1.2</td>
<td>4</td>
</tr>
<tr>
<td>1998</td>
<td>16</td>
<td>1.3</td>
<td>4</td>
</tr>
<tr>
<td>1999</td>
<td>18</td>
<td>1.3</td>
<td>4</td>
</tr>
<tr>
<td>2000</td>
<td>20</td>
<td>1.3</td>
<td>4</td>
</tr>
<tr>
<td>2001</td>
<td>22</td>
<td>1.3</td>
<td>4</td>
</tr>
</tbody>
</table>

Note. Each line of the table represents a spatial unit and each column represents a month from January 1993 to December 2010. The colour of the cells reflects the increasing levels of incidence – grey level. Missing data are represented in black. The curve above the table illustrates the combined dynamics of all the provinces.

*Source: Van Panhuis et al., 2015.*
We can add to the above-mentioned techniques difficulties that are of a purely human nature and which assume full significance in a regional context. The first of these difficulties is simply linked to differences in language and also, writing. In a regional context, it is important that all the participants in a surveillance system have access to the information regardless of language. The second of these difficulties concerns the heterogeneities that may be observed on behalf of the different contributors. The contributors do not always have the same levels of resources and thus the same financial means. It is clearly essential to reduce to a maximum these differences by improving the surveillance means of the least well-off partners. However, it also necessary to avoid any sort of discrimination based on the quality of data. Indeed, poor quality data is always more informative than missing data. In such a context, we must make a special effort to convince the partners concerned to contribute to the database in spite of the problems in quality that they may encounter (Choisy et al., 2015).

Finally, let us note that a surveillance system is extremely costly to implement and that the quality of data largely depends on the allocated means and the motivation of the actors. Communicating the analysis results carried out on the database to the surveillance system’s financers and actors is the best way stimulate their motivation and efforts and thus improve quality.

Most of the above-mentioned difficulties are real in any context but become many fold the moment we work in a regional context in countries that are characterised by public health and resource problems that may be extremely heterogeneous. Supra-national institutions then appear to be a great necessity for the harmonious coordination of a surveillance system. Unfortunately, in Southeast Asia there is no solid initiative, for example at the ASEAN level (as ASEAN’s rationale is essentially for the free movement of people and goods) (Beatty et al., 2010). At the global level, there is the World Health Organisation (WHO) (Racloz et al., 2012). However, although the idea is a good one, its implementation for a policy at a regional level is particularly difficult in Southeast Asia. The WHO has actually six large areas of influence in the world, whose definition does not necessarily follow social realities. (see map 13)

This is particularly the case for Southeast Asia that finds itself divided between (i) the “Western Pacific” area that includes Việt Nam, Cambodia, Laos, Malaysia, the Philippines, Papua New Guinea and Sri Lanka, and whose decision-making centre is situated in Manila in the Philippines, and (ii) the “South-East Asia” area that includes India, Nepal, Bhutan, Bangladesh, Myanmar, Thailand and Indonesia whose decision-making centre is in Delhi, India. Southeast Asia is not only divided in two, but these two areas are quite widely intertwined. This situation makes the coordination of a public health policy at the regional scale particularly difficult.
1.5.3. The Spatial Dynamics of Infectious Diseases

Diseases move around in space. They move around either through a process of transmission from person to person, or by being conveyed by their hosts or their vectors or by the environment (wind or water). This is a phenomenon that has only very recently been characterised and quantified, specifically from data from surveillance networks. Depending on the mode of propagation, the spatial diffusion of diseases may take a variety of forms (Choisy and Rohani, 2012). In order to understand the spatial propagation mode of a disease in detail, we use statistical analysis and mathematical modelling approaches, and go constantly back and forth between the two approaches. Statistical analyses basically allow us to separate the signal from the noise in a data set. The time series on which we work in epidemiology are often extremely noisy for reasons stated in the preceding section. The application of signal processing techniques (Cazelles et al., 2014) allows us to extract efficiently the signal from these time series in the same way that an archaeologist removes soil from some remains. These statistical analyses allow us to characterise and quantify the spatial propagation of diseases. From this pattern, we can then make a number of hypotheses about propagation mechanisms that we can then test using mathematical models (Bolker, 2008). The idea is the following: each hypothesis is transformed into mathematical equations (model). For each of these mathematical models, the parameters are then estimated by using the data. The principle is to find
the combination of parameters that makes prediction of models as close as possible to the data. The models calibrated in this way (i.e. whose parameters are estimated from the data) are then compared with each other on the basis of the match between the prediction of models and the data. The model with the maximal adequacy is then retained and its underlying hypothesis is then considered to be the most plausible hypothesis. The other hypotheses are rejected. This is what we call inference (or hypotheses testing).

A simple model that was recently proposed to explain the spatial dynamic of infectious diseases is the gravity model in which the intensity of connections between two localities is mainly explained by the product of their population size and the distance that separates them (Xia et al., 2004).

Diagram 5. An Example of a Gravity Model

This model explains particularly well the spread of directly transmissible diseases such as measles in England (Grenfell et al., 2001) or the flu in the USA (Viboud et al., 2006). When transposed to a worldwide scale, this model appears to continue to function well, and especially for directly transmissible diseases such as the flu or SARS, except that the distances between localities do not here necessarily represent the geographical distance. Indeed, Brockmann & Helbing (Brockmann and Helbing, 2013) demonstrated that on a worldwide scale the distances between populations are, for
infectious diseases, better represented by the intensities of aerial connections than by real geographical distances.

For diseases transmitted by vectors such as dengue, this propagation pattern may be somewhat complicated by the potential influence of environmental factors and local climate. Thus, in such a context of populations placed in a network of interactions it sometimes becomes difficult to distinguish between local and distant influences on the local epidemiology of a given disease. By way of an example, Cummings and his collaborators (Cummings et al., 2004) demonstrated that the spatial dynamic of dengue in Thailand complies quite well with a gravitational model in which the disease spreads from Bangkok to other less densely populated localities in the country. By reanalysing the same data set, Cazelles and his collaborators (Cazelles et al., 2005) demonstrate, to the contrary, that the epidemiology of dengue is strongly driven by climatic factors, particularly the multiannual oscillations of El Niño. This phenomenon has been recently confirmed by a study of dengue carried out in eight Southeast Asian countries (van Panhuis et al. 2015). The joint influence of demographic and climatic factors to explain the epidemiology of dengue has also been demonstrated on more local spatial scales. Thus, in Cambodia, Teurlai and her collaborators (Teurlai et al., 2012) demonstrated that the spread of dengue is mainly driven by individual movements, with maximal propagation speed along road axes. On even more local spatial scales (the scale of the house or between houses), it seems that the movements of mosquitoes here also play an important role. In Việt Nam, climatic factors have also been highlighted on small spatial scales (Thai et al., 2010; Pham et al., 2011; Cuong et al., 2013). In the following section we are going to take a look at the consequences of the spatial dynamics of infectious diseases for their control, particularly in a spatial context in which the actors have very heterogeneous levels of infection and resources.

1.5.4. The Control of Infectious Diseases in a Regional Context

The control of infectious diseases on large spatial scales began in the middle of the 20th century with the implementation of mass vaccination policies (measles, whooping cough, etc.) (Anderson and May, 1992). The WHO coordinated several campaigns aiming to eradicate some infectious diseases on the global scale. The first of these to be eradicated was smallpox in 1977. The second on the list of candidates is polio, whose eradication seems imminent (Pallansch and Sandhu, 2006). Measles will certainly be next on the list. These eradication programmes are particularly difficult for highly contagious viruses such as measles (Poland and Jacobson, 2012). Diseases are even more difficult to eradicate when there are significant individual movements between populations, and even more so when the populations are heterogeneous in terms of risks and resources.

The ecological theory of metapopulations predicts that the global persistence of a disease largely depends on the dynamics of movement of individuals between sub-populations (Hanski, 1999). When these epidemiological dynamics in sub-populations are perfectly synchronous, global persistence is minimal.
The control of infectious diseases in a regional context

Graph 10. Synchrony and Persistence

Notes. The curves (1) and (2) illustrate epidemic dynamics in two localities. When the dynamics are asynchronous as in the figure, an extinction (curve 1) may be compensated by a re-colonisation by infected people from the population in curve (2), thus contributing to global persistence (i.e. the two combined populations). When, on the contrary, the epidemic dynamics in the populations are perfectly synchronous, the re-colonisation process can no longer take place because when the virus becomes extinct in a population, it has a very weak prevalence in the other population, thus limiting the chances of re-colonisation and therefore global persistence.

Source: Author’s construction.

Contrarily, when the dynamics in sub-populations are asynchronous, global persistence increases as local extinctions may then be compensated by re-colonisations by sub-populations whose local density is still high. What is more, the control policies of infectious diseases may increase or decrease the synchrony between sub-populations. For example, mass vaccination tends to decrease the synchrony between sub-populations (Rohani et al., 1999) whereas pulse vaccination may on the contrary be used to increase the synchrony between sub-populations (Earn et al., 1998). Knowing this, work is currently being carried out to attempt to optimise control policies in a spatial context by taking into account the spatial dynamic between sub-populations and its effect on global persistence.

The problem becomes even more complicated when the actors in question are not equal in terms of the infectious risk and the means used to contain this risk. This problem was raised particularly in the context of the worldwide risk posed by avian flu where maximal incidences were observed in the poorest countries. It is then that we must raise the question concerning the optimal strategy for the rich and least affected countries faced with contamination from high-incidence (and often poor) countries. Using a mathematical network game theory model, Colizza and her collaborators (Colizza et al., 2007) demonstrated that the optimal strategy of rich countries to minimise their own risk is to allocate a part of their resources directly to countries that are both low in resources and
have high incidences. This result that is to some extent counter-intuitive may be explained by the fact that nowadays populations are very strongly interconnected with each other. Thus the epidemiological situation in France closely depends on the epidemiological situations in other countries of the world, all the more so as the latter experience high incidences and are closely linked to France. Research on the same theme is currently being carried out regarding dengue, in Việt Nam and between Southeast Asian countries.

In Việt Nam dengue currently has very high transmission rates in the south of the country, as well as reduced seasonality. In the north of the country, dengue has been emerging over the last fifteen years (Do et al., 2014). Furthermore, the seasonality of transmission is a lot more pronounced in the south, certainly because of climatic factors. In the north, there is a season with very few cases. Phylogeographic analyses have recently demonstrated that the local persistence of the dengue virus in Hà Nội is very weak and that, each year, the outbreak of dengue epidemics is the result of the importation of the virus from the south of the country (Rabaa et al., 2010). In such a context, we can then ask ourselves what is the optimal strategy for the fight against dengue in Hà Nội. Is it preferable to allocate all local resources to fight local vectoral risks or is it preferable to allocate a part of resources to the south of the country in order to contribute to the reduction of incidence in the south of the country and thus reduce the risk of an outbreak of the virus in the north of the country? The answer to such a question can only be provided by a sufficiently detailed epidemiological model that takes into account environmental, demographic, entomological, transport, and economic factors.

Very similar problems may appear in very rich countries such as Singapore, which is very near to much poorer countries with increased risks of dengue such as Cambodia. In order to reduce the risk of dengue in Singapore, is it in the government’s interest to allocate a part of its resources directly to Cambodia?

Communication corridors pose a similar problem. These axes that are characterised by very intense individual movements cross through countries at risk with very heterogeneous resources (Fau et al., 2014). An efficient infectious disease control policy on a regional scale can thus only be implemented with supra-regional mutualisation and coordination. Small initiatives are beginning to emerge in this direction that deserve to be further developed.

**Conclusion**

The transmission process of infectious diseases is by nature **nonlinear**, which generates particularly complex dynamics that can behave in non-intuitive ways (Turchin, 2003). In this context, the mathematical models provide indispensable help in helping us to understand how epidemic dynamics function and thus allow us to predict and control them as efficiently as possible (Anderson and May, 1992; Diekmann and Heesterbeek, 2000; Keeling and Rohani, 2008). The realism of the models directly depends on the quantity of data available for their calibration. For this purpose, the availability of data from surveillance systems is absolutely crucial. These surveillance networks are extremely costly to implement and maintain over time. However, they are absolutely fundamental for a coherent and efficient control policy. They allow us to measure the epidemiological state of the
population as well to assess the efficiency of vaccination policies. Close communication between the authorities in charge of surveillance networks and control policies, as well as with the scientists who analyse the data from surveillance networks, is absolutely necessary. Communication about analysis results and their practical implications particularly allows us to convince the authorities of the necessity of maintaining surveillance networks and guaranteeing their quality (Brownstein et al., 2008; Keller et al., 2009).

In addition to the biological factors and the scientific criteria of the fight against infectious diseases, we should not neglect the importance of the socio-economic factors that greatly add to the complexity of the problem. Here again, modelling approaches are indispensable for resolving problems where the issues may be complex and contradictory. Close integration between biological and socio-economic criteria in the same theoretical framework still has yet to be built.

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**Glossary**

Calibration: calibrating a model consists of estimating the values of its parameters from the data.

El Niño: multi-annual climatic phenomenon (4-7 years) characterised by abnormally high temperatures.

Incidence: number of new cases by spatial unit over a given period of time.

Inference: inference is testing a hypothesis, which then allows us to answer a question.

Infectious disease: illness caused by a pathogen (virus, bacteria, protozoan, parasite, etc.) as opposed to chronic illnesses such as cancer, heart disease, or genetic illnesses. Infectious diseases are also referred to as transmissible.

Germ theory: theory developed at the end of 19th century stipulating that contagious diseases are caused by pathogenic organisms (viruses, bacteria, etc.). In opposition to the miasma theory that was believed at the time, according to which illnesses were transmitted by “bad air”.

Mass vaccination: vaccination policy aiming to vaccinate the maximum number of children before a certain age. Generally carried out in schools.

Metapopulation: population of populations, the latter being referred to as sub-populations.

Miasma theory: see germ theory.
Noise: the total variation in a data set may be divided into noise and signal. The signal is the interesting part of this variation whereas noise is the nuisance variation. The distinction between noise and signal depends on the question asked. The origin of noise may be multiple: observation error, error of process, co-variable, etc.

Nonlinearity: a function is said to be nonlinear when its outputs are not equal to its inputs. The essence of mathematics assumes hypothesis of linearity whereas the essence of nature is in fact nonlinear. Nonlinearity generates complex and often non-intuitive behaviour.

Parameter: the two ingredients in models are variables and parameters. As its name indicates, a variable is a quantity that varies in function of the values of the parameters and the other variables (of which possibly time and space). Parameters on the contrary are generally fixed quantities whose values are chosen by the modellers. Generally variables chart the number (e.g. number of the sick) whereas parameters chart biological processes (e.g. contact rate).

Phylogeography: a phylogeny is the estimation of a genealogy. Phylogeography is a phylogeny combined with geographical information.

Prevalence: number of cases by spatial unit at a given moment.

Pulse vaccination: vaccination policy proposed in the 90s that consisted of regular vaccination campaigns in which only a certain proportion of the population is vaccinated.

Signal: see noise.

Signal processing: statistical methods for time series analysis.

Time series: a time series is a time-ordered a set of data (typically the number of new cases of an illness per week).

Transmission: contagion process of an infectious disease. Transmission may be direct (i.e. through direct contact) or indirect. In the second case, it may be assured by a vector (generally an insect) or by the environment (e.g. water as in the case for cholera).
References


Shared Challenges for Development within ASEAN


1.6. Summary of the Plenary Sessions.
Shared Challenges for Development within ASEAN

Krisna Uk – Centre for Khmers Studies

The regional construction of Southeast Asia, the challenges and economic corridors of regional integration, the fight against climatic changes and the control of infectious diseases are the many challenges of this part of the world conventionally called "ASEAN". With a surface area as large as Europe and population of about 625 million inhabitants, this region remains under stress from historical trends and multiple geopolitical, cultural, economic and religious realities.

"Does ASEAN only exist on paper?" inquires Hugues Tertrais. We know the nations that compose it, we also know its regions and their dimensions but can we conceptualise ASEAN in terms of a "community"? The purpose of this summary is to tease out the main lines of inquiry discussed during these two days of plenary sessions and to reassess the big development challenges faced by the countries either individually or collectively.

By using an emic approach centred around the perceptions and the concerns of a person living in Southeast Asia, this summary will examine in turn the questions of i) "diversity"; ii) identity and collective awareness; iii) the role of China and the challenges it elicits; iv) and the key issue of security, which will reassign the roles and responsibilities of each and every nation.

1.6.1. The Notion of Diversity, a Key Feature of ASEAN

Hugues Tertrais called attention to the fact that what characterises ASEAN is probably the diversity of its ten countries – or 11 if we include Timor-Leste. This diversity appears at multiple levels in terms of wealth, greenhouse gas emissions and the responses formulated to address global warming.

The ADB estimated that with USD 49,000 to USD 62,000, Dollars per capita, Brunei and Singapore were largely ahead of poorer countries such as Myanmar, Laos, Cambodia and Timor-Leste with only USD 2,000 to USD 2,500 at purchasing power parity in 2011. With the exception of Malaysia with USD 16,100, the rest of the countries that compose ASEAN have a rate that varies between
USD 3,400 and USD 10,000. The regions’ wealth is concentrated in the heart of Southeast Asia, which is also home to the most limited number of inhabitants. With 5.4 million people living in Singapore and only 400,000 in Brunei, Indonesia in comparison counts for 40% of the entire ASEAN population with 250 million people, which makes it the largest concentration of Muslims in the world.

This disproportion in terms of per capita income also reveals gigantic divides between the countries. These divides are also illustrated cartographically, since the further we move from the wealthy core of Singapore, Brunei and Malaysia, the lesser is the income as the periphery of the region is where most developing countries are located. As Hugues Tertrais noted about, Singapore and Brunei “the two states are positioned on the maritime road of East Asia and their currencies are aligned: 1 Bruneian $ = 1 Singaporean $. They are a haven for major sovereign wealth funds in the region” (Tertrais, 2014).

As explained by Nathalie Fau and Thomas Vallée, the economic exchanges and flows within ASEAN are equally characterised by the seal of diversity. These flows highlight the privileged relationships some countries have engaged with each other since their transactions are stimulated by specific comparative advantages, but also tariffs that some countries bring at the expense of other countries or worse, at the expense of the entire community.

According to Thomas Vallée, this great diversity appears very clearly in the evolution of the KOF Index, which shows important gaps in the countries’ levels of integration in global trade. The 2015 Index of Economic Freedom published by the Heritage Foundation confirms that Hong Kong and Singapore are the countries that are best prepared for global integration, much ahead of other ASEAN countries such as Cambodia and Việt Nam, which rank 110 and 148, respectively. This is due to limited economic freedom and a high corruption rate, which are the two major obstacles for the promotion of trade within ASEAN.

Such unequal trade probably stems from the fact that members can benefit better from transactions outside of the economic community than between members. This is due in part to China and India’s activities, which stimulate the entire Asian region with new dynamic commercial trends.

On the other hand, the size of the population and the industries on which depend the economic development of each country are determining factors that influence the rates of greenhouse gas emissions. In the case of Việt Nam, the rate of tonnes CO2 equivalent per capita is less than 2, while Singapore is rated 3. In this context, the countries with the highest emission rates are Malaysia, Japan, Taiwan and South Korea (with a rate of 12 for the latter). An alternative emission rate calculated based on equivalent of carbon dioxide gross domestic product (kCO2/GDP) offers a different picture, however. Indeed, Việt Nam jumps 8 notches and reaches the 3rd place of the most polluting countries behind North Korea, Mongolia and China, while Singapore and Japan are relegated to the bottom end of the spectrum.

We can notice clearly here that the use of particular indicators has wider implications in defining the roles and responsibilities of each country in the large-scale context of global warming. Yet one important aspect to factor in is the degree of development of the country, which in some cases necessitates the massive use of hydrocarbons (i.e. coal, petrol, gas) to ensure its sustainable economic growth and the ability to better compete with most developed countries in the region.
In this context, the integration measures can follow three approaches: the composite indicators, the traditional indicators and the "network" indicators. But for Thomas Vallée the question arises as to whether ASEAN should establish "rules" in order to prevent countries from circumventing the tariff barriers or promote "solidarity" between its member countries with a view to stimulating competition inside the zone?

Alongside the diverging tools of economic development is the multiplicity of responses formulated to address climate change as presented by Remi Genévey in the work of AFD. With more than EUR 18bn invested across various continents, AFD Group has financed activities that are co-beneficial for the challenges of climatic changes. In 2014, AFD funded 89 development projects inclusive of 'climate projects' that specifically make use of renewable energies and the most creative and efficient solutions to promote local economic and social development. AFD's photographic exhibition organized by AFD in Đà Nẵng in July 2015 "60 Solutions against Climate Change" is in this context an intellectual, cultural and aesthetic showcase that illustrated the diverse livelihood strategies adopted by men and women who are faced with the problems of deforestation, air pollution, energy consumption, transport and many more across the globe.

Nonetheless, as Marc Choisy pointed out, there is, and at a more complex level, a diversity within the response mechanism itself that unfortunately hinders the efficiency of the solutions devised by governments and international organizations. In the context of the control of infectious diseases, the WHO is a case in point since the problem of diversity (or disparity) appears at equally varied levels. The regional surveillance of infectious diseases best illustrates these problems since the diversity factor can be found embedded in the objectives, in the capacity and the areas of expertise, in the means employed, in the definitions and in the administrative divisions, as well as in the cultures and languages.

In addition to the diversity between the countries of the region, there is a diversity that remains intrinsic to each country, thus rendering the notion of "community" even more complex to fathom. Indeed the multiplicity of the languages and cultures are major factors that affect people’s perceptions of identity and also national sovereignty. In addition to that, a national of an ASEAN country is aware that the principle of non-interference governs the ASEAN member states. With the exception of the threats of terrorist attacks, this policy of non-interference produces an incapacity to take common decisions, which furthers the image of the ASEAN as a giant association standing on shaky ground. This predicament reflects the perception that Southeast Asian inhabitants have of the ASEAN community. In fact, if this collective consciousness really existed, it is improbable that it would match the geographical contours of this region without apparent unity, and in some cases, it may not even coincide with the national borders within which people live.

1.6.2. Identity and Collective Consciousness

"From whichever angle we view Southeast Asia (topographic, ethnolinguistic, cultural, demographic, political and economic), it appears as a mosaic of situations so diverse we can barely find coherence in it. In very few places around the world can we encounter such a broad array of languages that are so rich, a variety of cultures that are so consideratable, a spread of population so uneven, political traditions
Shared Challenges for Development within ASEAN

apparently so antagonist... Being aware of this diversity is a challenge in itself; yet it is crucial to understand the complexity of the region” (Tertrais, 2014).

At the dawn of its 50th anniversary which the Bangkok Declaration of 1967 will commemorate, ASEAN remains in search of a collective identity. The concept of “region”, which is often associated with it, underlines this very complexity since it can both define a group of countries, but also a much smaller geographical space within a country. We are reminded of significant diversities at the heart of ASEAN members, which on the one hand may constitute an asset and on the other, an obstacle to the creation of an identity, let alone a collective consciousness.

"What is a nation, and what is this sense of nation that makes it possible, for people to identify body and soul with others that they don’t know and will never know?” (Anderson, 1991). In his historiographical reflections on the concept of national imagining, Benedict Anderson demonstrates that the idea of national sovereignty cannot spring naturally from people’s minds even if they were deeply attached to their ethnic identity, to their customs and to their borders. It is only with the emergence of capitalism and the invention of the printing works that the concept could take shape, evolve and spread itself to attain the "imagined communities" that form the nations.

For Anderson the conclusion is “[The nation] is an imagined political community and imagined as both inherently limited and sovereign. It is imagined because the members of even the smallest nation will never know most of their fellow-members, meet them, or even hear of them, yet in the minds of each lives the image of their communion.”

The ASEAN motto “One vision, one identity, one community” exemplifies this ambitious and imagined collective unity and enables states to draw on this collective political will so as to temper the differences and mask inequalities between the ten countries. Now this community, which officially constitutes ASEAN, keeps on growing by means of frequent encounters focused on energy, transport, information and technological communications. We will then speak of ASEAN+3 which expanded to include China, South Korea and Japan, and ASEAN+6 to which Australia, New Zealand and India were added. As mentioned by Thomas Vallée, although some of the emerging countries have yet to be fully integrated, the enviable growth rates and the urban transformations displayed by this ASEAN Economic Community attract more and more foreign investments. Indeed, the ASEAN+3 Economic Community represents by itself 85% of all exports in Southeast Asia and the Pacific. Its intra-regional trade remains weak, however, especially when compared to its European equivalent within which 70% of the commercial trade is done. One of the major reasons is that some countries export to China and Japan, which in turn export outside the regional community.

Despite the heterogeneity linked with different stages of economic development, one element that seems to help maintain cohesion within this complex entity is the shared concerns. As discussed by Sophie Boisseau du Rocher (2009), these concerns can take the form of social inequalities that keep on widening, the violations of human rights, the threat of eruptions of extremism and the destructions of the environment caused by climatic changes and anthropogenic activities, whose effects may well become irreversible.

This collective consciousness firms up when confronted with transboundary climatic threats that may affect several countries in a brutal and simultaneous manner. These climatic changes can
indeed become dangerous especially when they affect the water-energy-food security nexus. They are particularly threatening to vulnerable populations who often lack alternative means of survival to mitigate a drought or a devastating flood.

The Mekong River is one of the largest rivers in the world. It starts its journey from the Himalaya chains and runs a distance of more than 4,600 km before completing its course in the delta in Viêt Nam. The Mekong is the personification of this vital water-energy-food security nexus. It links China, Myanmar, Laos, Thailand, Cambodia and Viêt Nam. With more than 1,100 fish species, it also provides the needs of more than 70 million people living in the Greater Mekong Basin. Local populations build their livelihood strategies on fisheries (with 2 million tonnes of fish per year), on subsistence agriculture practised on 800,000 km² of flooded plains as well as on the multiple hydroelectric dams. Located in the heart of Cambodia, the Tonle Sap through which the Mekong runs its course is the largest freshwater lake in the region, which makes it possible for one million people to practise fishery, subsistence agriculture, and subsistence economy, as it produces 80% of the proteins they need on a daily basis.

Yet climate change affecting the water discharge would have disastrous effects on this lower part of the basin, thereby putting Cambodia and Viêt Nam in an extremely vulnerable situation. This vulnerability is further exacerbated by the constructions of dams upstream, mostly financed by China, with the prime objective of producing a significant quantity of energy for export. It is within this specific context that Laos seeks to reposition itself on the regional scene as the “electric battery” of ASEAN. As one of the poorest member countries, regional investments in Laos are aimed first at creating electricity for foreign consumption in countries like Thailand, Viêt Nam and China. With 15.5 billion kWh produced between September 2013 and October 2014, the 12.5 billion kWh exported provided the Lao State with a net income worth USD 610m. Although hydroelectricity has become one of the pillars of the Laotian economy (with the annual rate of 8%), both the social and environmental costs of these dams may become extremely costly in the long-term.

This situation thus creates political tensions where the economic challenges on the one hand, and the social challenges on the other, put in competition individual opportunities with the security of the countries located downstream. In this context of potential conflicts, China’s economic and political weight will play a determining role in the evolution of the relationships between the member countries.

1.6.3. China’s Role: Some Significant Challenges

In the framework of ASEAN+3, China is undoubtedly the major player whose influence weighs most heavily on Southeast Asian countries. The presence of China in the region dates back centuries. Originally facilitated by trade across the region, the Chinese established diasporas in the major cities of Thailand, Malaysia, Singapore and Indonesia, thereby creating a geographic “opening” from southern China to the Indian Ocean. With 1.3 billion inhabitants, the needs of its economic growth and the energy demand of this massive country represent national challenges for the member countries insofar as transboundary effects have a bearing on the entire region.
From an economic point of view, China’s influence increases steadily by means of trade, investments and financial aid to emerging countries in need of infrastructure. In addition to infrastructure development projects that put China, Japan, South Korea and financial institutions like the ADB in direct competition at a national scale, ASEAN develops its own network of connectivity in order to develop infrastructure, facilitate exchanges and encourage people’s mobility. This notion of “connectivity” undoubtedly stems from the need to reduce the economic disparities and to build a coherent and transboundary structure in anticipation of the ASEAN Economic Community.

ASEAN defines connectivity as follows: “the physical, institutional and person-to-person linkages that comprise the foundation and facilitative means to achieve the pillars of socio-cultural, economic, and political security towards realising the vision of an integrated ASEAN Community”. With this perspective of connectivity, ASEAN developed its strategic plans for transportation (2005-2010 and 2011-2015) with the objective of promoting the development of intermodalism with a priority given to the least developed countries (Cambodia, Laos, Myanmar and to some extent Việt Nam).

As demonstrated by Nathalie Fau, this connectivity can take various yet complementary forms. These include the railway network with the north-south road linking Kunming to Singapore for instance, the network of maritime transportation, and the dry port network that cuts across the region and beyond, thereby replicating the routes adopted by the economic corridors. Besides the physical corridors that connect a place with another, economic corridors attract investments and create economic activities alongside least developed countries, according to the ADB definition. For this to become feasible, however, the physical links and logistics must be in place in order to bridge the industrial centres and the peripheral regions.

According to the Economic Research Institute for ASEAN, the major North-South, East-West and Southern corridors have already greatly benefitted the member countries. The emerging countries are the ones who have most profited from its economic impact with the following figures: Myanmar 145.8%, Việt Nam 114.6%, Laos 99.3%, Thailand 98.6% and Cambodia 97.9%. These corridors illustrate the desire to connect neighbouring countries thereby asserting the “centrality” of ASEAN vis-à-vis others like China, Japan, South Korea, India – with the example of the Mekong India Economic Corridor – Australia and New Zealand.

Despite some economic advantages stimulated by the corridors (i.e. development of dynamic urban areas, new employment opportunities, better access to infrastructure), certain countries like Myanmar may be tempted to favour their regional integration at the expense of national integration. With more than 100 ethnic minorities, 14 states and regions as well as internal conflicts, which for some remain the most severe in the region, Myanmar’s regional integration may fall short of addressing the problems of inequality that affect the country. In a certain sense, this conclusion is reminiscent of, albeit at a smaller scale, the issues raised by Hugues Tertrais and Thomas Vallée concerning the difficulty of building a strong ASEAN on foundations originally undermined by the weaknesses of a few member countries.

Although the economic appeal of these infrastructure projects can be significant, China’s influence remains a determining factor in the strategies adopted by emerging countries. Indeed, by means of the Asian Infrastructure Investment Bank (AIIB), China posits itself as a privileged partner in response to the growing demand for new infrastructure in Southeast Asia and Central Asia. In light of this, the
AllIB is in direct competition with large international financial institutions such as the World Bank, the ADB and the International Monetary Fund (IMF). As discussed by Remi Genevey, this bank is intent on reaching an operating fund worth USD 100bn and operates under different ethical guidelines. The AllIB forms an integral part of China’s new Silk Road strategy.

For Sophie Boisseau du Rocher, this external support comes with a political cost, sometimes even military, thereby challenging the political balance among the ASEAN countries. China’s growing presence in Cambodia, Laos and Myanmar creates a region within ASEAN’s larger region. In the eyes of other nations, this satellisation is a worrisome challenge that has the potential to affect the economic future and modify the geopolitical scene of ASEAN.

This concern is even shared with countries located outside the ASEAN. Indeed Japan multiplies its bilateral funding in order to offset China’s economic and political influence. Until now, it has also refrained from investing in the AllIB. India, by way of economic corridors and the creation of the Mekong-Ganges River Cooperation project, aims at counterbalancing China’s expanding effects.

In light of its “Rebalancing Asia” foreign policy, the United States invest their political and economic resources, as well as the security means to limit conflicts, in a region of the world where they too have substantial economic opportunities. The main strands of the policy consist of: 1/ strengthening the relationships with its partners, inclusive of emerging powers like Indonesia; 2/ integrating the United States into the ASEAN political and economic structure, thereafter giving it a role to help maintain security in the region; 3/ developing good working relationships with China in order to collaborate on issues of world security and economy. “Rebalancing Asia” takes on a very significant meaning, especially in the context of the South China Sea disputes where issues of sovereignty currently take place and where their consequences are still difficult to predict.

### 1.6.4. Security in the ASEAN

Owing to its geographical location, ASEAN is also at the heart of global trade because the maritime corridors stimulated by the Malacca Strait pass through it. In such a dynamic geographical area, non-ASEAN members try to carve out their own place, sometimes using forceful means.

“The South China Sea is one of the rare maritime spaces in the world where the boundaries are not clearly defined, thus resulting in concurrent claims. Six maritime States (and territorial areas) are at the forefront: China, Taiwan, Việt Nam, the Philippines, Malaysia and Brunei; three others are slightly in the background: Thailand, Cambodia and Indonesia. Confronted with Southeast Asia’s emerging countries, China claims most of a zone traversed by one of the main maritime routes on this planet, which also happens to be endowed with significant resources.” (Tertrais, 2014). Rich with significant oilfields, abundant fishing opportunities and the presence of maritime routes that are the most travelled in the world, China’s construction of air and naval bases in 2015 only increased the tensions with other claiming states.

In addition, Japan has recently voiced its strong concerns over the territorial conflict following massive land reclamation activities in terms of port construction and the transformations of coral reefs with irreversible environmental consequences. This territorial expansion enables China to increase its territories and its sphere of influence across the region. Besides China’s geopolitical weight, population movements across the economic corridors and tourism transportation axis pose...
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a major threat when it comes to infectious diseases. As illustrated by the avian influenza A(H7N9), the trajectories of the viruses can have a disastrous impact on an ever more mobile and growing population.

Marc Choisy’s analysis nicely complements Nathalie Fau’s study of the economic corridors insisting on the fact that infectious diseases such as Severe Acute Respiratory Syndrome (SARS) or Mexican flu have a very particular spatial dynamic. Like climatic changes, viruses know no borders and have the ability to spread from one continent to another very rapidly across often very long distances. This case study compels us to re-think the distances, which are not always spatial ones. The case of SARS demonstrates that the distance of the disease differs from the spatial distance of 4,000 km that separate New York from Los Angeles, for instance. The “gravity model” confirms this, exposing that the disease has a distribution and a life-cycle in a space that is very distinctive to it.

In the epidemiological context, the most important security measures are the ones that are implemented by the surveillance mechanism. This surveillance involves the installation of a network, data collection, analysis and the diffusion of the findings. The core component at the heart of a successful surveillance is the information, or in other words, the quality of the data. In a country like Việt Nam, where communication channels inevitably go through a hierarchical network, the risks of data loss, time shortage, and lack of trust are obstacles that may become fatal to the affected populations. To prevent an epidemic disaster in the region, the Mekong Basin Disease Surveillance has been created with research units in Singapore, Indonesia and Malaysia focused on dengue. The main purpose is to collect accurate information in order to create a database that will be both transboundary and accessible to all.

In light of the South China Sea disputes, climate change, polluting anthropogenic activities, epidemiologic threats, the dangers of extremism, and water scarcity (one of the greatest issues of the 21st century), the challenges in ASEAN will have to be thought of in terms of human and economic security. In order to reach concrete and sustainable solutions, these challenges need first and foremost to be shared for they necessitate a collaborative approach, sharing of information, transparency of investment projects, as well as rules to protect the borrowing countries of the AIIB.

But should ASEAN function according to rules or should it practise solidarity? In the long-term, solidarity seems the most beneficial option, since it may enable the emerging countries to fully participate in the economic growth of the entire region while developing genuine comparative advantages. However putting in place rules or safeguards would also act as a deterrent to some countries, since it would prevent them from deliberately circumventing the tariff barriers, which often trigger exchanges but also render them unbalanced. Therefore, a more united and less asymmetrical ASEAN would not only profit the ten countries, it would also benefit its neighbouring and international partners. In this sense, ASEAN does exist more than on paper, it has a central place in Asia, but both its interior and exterior construction remain a work in progress, and the community is in the making.
Selective Bibliography


Part 2. Workshops
2.1. Long-Term Regulatory Convergence and Financing

The central topic of the JTD 2015 "Shared challenges for development within ASEAN, methods of analysis and their implementation" has been addressed from the standpoint of convergence in regulatory matters and of the major issues generated by the protection of investors on the financial markets of ASEAN countries.

Significantly, the framework analysis that has been drafted is based on the idea that sustainable economic development and the emergence of a stable financial system would not be feasible in the absence of a climate favourable to investments and entrepreneurial initiative on all the markets. The defining element of such a development strategy thus becomes "the company" and "the climate of confidence" that reigns in relations with potential investors. The convergence necessary to attract financing and stimulate investments involves several steps: (i) the creation of market infrastructures; (ii) the harmonisation of regulatory texts on the subject and (iii) the creation of a specific "ASEAN" brand in order to improve the visibility of this geographical zone.

[38] A first version of the texts by Diana Pop and Adrian Pop was the subject of a presentation at the JTD 2015. They were presented respectively, on Days 1 and 2 (shared) then on the morning of Day 3. The authors would like to thank Stéphane Lagrée for the flawless organisation of the JTD, as well as the participants for their stimulating remarks.
In order to organise more efficiently the debate surrounding the institutional particularities of member countries and the priorities in terms of reform, the Organisation of Economic Cooperation and Development (OECD) began, from 2014, a specific programme devoted to corporate governance, development and the integration of Southeast Asian financial markets. Thus, the topics addressed during the first three sessions of Workshop 1 naturally concern the main lessons from these initiatives and the OECD discussion groups – Myanmar, July 2014; Viêt Nam, May 2015 – OECD – Southeast Asia Corporate Governance Initiative – by anticipating certain events programmed in the OECD agenda, such as the regional round table (Thailand, October 2015 – OECD – Asian Corporate Governance Roundtable).

The contribution of this chapter firstly concerns a presentation of the OECD framework on corporate governance, while at the same time focusing on the most problematic aspects for ASEAN countries. The second topic proposes a theoretical approach to the ownership structure and the role that it plays in the improvement of corporate performance. Finally, we will address a particular type of operation that raises multiple questions about other, developed and emerging, markets notably the relationships between so-called related parties. This time the question raised is how other markets might use the Asian experience to understand better the effects of this type of operation on the creation/destruction of value. The last part will place financial regulation in perspective by underlining the essential role that statistical data play in order to appreciate correctly the performance of the chosen policies.

**OECD Principles for Effective Corporate Governance**

According to the OECD definition, corporate governance allows us to establish the link between corporate objectives and the means implemented to attain them and guarantee performance. Although this definition summarises the lines of action at the corporate level, semantics only give us a small glimpse of the fractures that separate the parties involved, namely the shareholders, the suppliers, the clients, etc. According to Shleifer and Vishny (1997), governance mechanisms must encourage all capital providers by ensuring them a return on their investments.

The typology of governance mechanisms demonstrates the fact that the conflicting objectives of stakeholders may be aligned through the use of either incentive or coercion mechanisms. Although each mechanism may represent in itself a subject of reflection, we will focus, in the following part, on those concerning regulation and internal governance, by underlining the role played by the ownership structure and by boards of directors. When the framework allows it, we associate the evolution of the ownership structure with the subject of corporate control transactions.
What is a good system of corporate governance?

The answer lies in the chain of foreseeable effects of the systems that incite the decision makers to pursue the objectives in accordance with the interests of the providers of financial resources, notably the shareholders -> closer monitoring -> more confidence -> functioning market economy -> cheaper capital -> more efficient use of resources -> economic growth.

According to the OECD, the regulatory, institutional and legal structures and the good practices that seek to create a corporately favourable context must:

- Ensure the implementation of an efficient governance framework that promotes market transparency and the respect of the rule of law;
- Define the rights of shareholders and the key functions of share ownership;
- Ensure that shareholders are treated equally;
- Define the governance role of other stakeholders;
- Ensure the divulgence of information and transparency;
- Define the responsibilities of the boards of directors.

The particular attention paid to the protection of shareholders and the exercising of their rights lies in the complexity of the arrangements that may be implemented to dissociate property rights from control rights. Traditionally, the possession of a share gives the holder a right to vote in the general meeting of shareholders (GMS). Thus, a certain balance would be ensured between the financial effort of shareholders and the weight that their decisions represent among the total of all votes cast. Nevertheless, the experience of enterprises listed on the stock market is completely different. The implementation of property pyramidal structures, cross ownership, as well as the structuring
of capital by multiple share classes – that either confer more voting rights per share, or limit, or even cancel these rights (often in exchange for a more attractive dividend) – now allow certain shareholders to exercise *de facto* control over the company.

In addition, some shareholders without any apparent ties and who, individually, would be considered as minority shareholders, may act in concert and even constitute an effective majority in the GMS. The agreements between the latter are governed by complex conventions that notably stipulate: *(i)* preferential purchasing rights if the other party in the agreement decides to sell his shares; *(ii)* prohibition to sell the shares during a certain period of time; *(iii)* the manner in which the board of directors (BD), or its Chairperson, is chosen; *(iv)* obligation to vote in a concerted manner, as if they were a single shareholder.

In order not to break the trust of small investors – a *sine qua non* condition to ensure economic development –, shareholders must have access to this information and, above all, have their say in all decisions concerning fundamental changes; emission of supplementary shares; special transactions, such as the large sale of assets that would represent the actual sale of the enterprise. Transactions involving corporate shares must be conducted at transparent prices and in equitable conditions.

The proper exercise of shareholders’ rights, especially minority shareholders and foreign investors, calls for effective ways of contesting direct or indirect wrongdoing by the controlling shareholder. Abusive dealing is often very difficult to detect, as, at first sight, it appears to be a normal transaction, carried out during the day-to-day dealings of corporate activity. A non-exhaustive list of problematic transactions includes: *(i)* employing and paying high salaries and bonuses to members of the director’s family or to his/her associates; *(ii)* special commercial and financial relationships with related parties; *(iii)* the systematic making of biased decisions; *(iv)* the emission of new shares that change the shareholding structure in favour of the controlling shareholder. As there is no basis to prohibit these operations, the controlling authority of financial markets defines correct price standards to be respected, explicitly recognises the right of shareholders to benefit from an analysis carried out by independent experts and sometimes the right to litigation.

This objective for the equal treatment of shareholders necessitates unconditional access to immediate and adequate information relative to all corporate events. The divulgation of information allows us not only to compare the performance of different jurisdictions, but also to help strengthen market discipline and improve governance-related practices.

At the micro-economic level, increased transparency results in greater flows generated by enterprises, by a better valorisation of enterprises on financial markets and, ultimately, by greater attractiveness in the eyes of domestic and international investors. The latter interpret both periodic information – annual or quarterly financial information – but also information that is likely to affect the market price. Hence the importance of placing at the disposal of markets, in a standardised form if possible, details concerning: *(i)* changes in the management team; *(ii)* major occasional transactions, such as mergers, corporate divesture, etc.; *(iii)* the loss of important clients; *(iv)* significant changes in the economic environment; *(v)* litigations in which the enterprise is involved; *(vi)* trading carried out by insiders; *(vii)* debt default events; *(viii)* the launch of bankruptcy or reorganisation proceedings.
Another dimension of corporate governance concerns the responsibility of the BD. The latter operates between the shareholders and the director who is mandated by the shareholders to make day-to-day decisions. Its role is to ensure that the objectives pursued by the manager do not destroy the value of the enterprise for the shareholders. One of the BD’s responsibilities, and certainly the most difficult, concerns the salary levels of the management team. What is more, the BD lists all the transactions made by the managers, the controlling shareholder and other insiders, whatever their (financial or commercial) nature, in which the enterprise is involved before putting them to the vote of the General, or Extraordinary, assembly of shareholders.

Although the respect of the principles of corporate governance elaborated by the OECD improves liquidity and corporate valorisation, the contribution of each of these principles is nonetheless not homogeneous. In order to identify the enterprises that have adopted good governance and then class them so that investors may knowingly choose, a specific index has been available, since 2012, called the ASEAN scorecard. This index is arrived at by the weighting of each important principle of governance according to the grid presented in the table below. We add to this a bonus-penalty system in function of the quality of governance. Nevertheless, behind these unique concepts there are a lot of details that make comparisons difficult, and sometimes incoherent, between the different markets in the region.

<table>
<thead>
<tr>
<th>Principles of governance</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shareholders’ rights</td>
<td>10%</td>
</tr>
<tr>
<td>Equal treatment of shareholders</td>
<td>15%</td>
</tr>
<tr>
<td>Role of stakeholders</td>
<td>10%</td>
</tr>
<tr>
<td>Communication and Transparency</td>
<td>25%</td>
</tr>
<tr>
<td>Responsibility of the Board of Directors</td>
<td>40%</td>
</tr>
</tbody>
</table>

Source: Author’s construction.

An analysis plan and the gathering of data about the quality of governance should be structured around six different categories of question:

- What is the ownership structure and the identity of the largest shareholder in each listed company?
- What operations must be agreed to by the shareholders and what is the threshold of votes necessary for the shareholders’ resolution to be effective?
- What is the actual participation rate of shareholders in the GMS?
- Are voting rights evenly distributed among the shareholders?
- Are minority shareholders formally protected against insider dealing and abusive transactions between related parties?
- What is the actual procedure for electing members to the Board of Directors?

Understanding and identifying the unfair treatment of minority shareholders in relation to the controlling shareholder necessitates a review of some questions for each category likely to allow a qualitative judgement of governance – a summary is to be found in the annex. Most significantly, the comparisons cannot neglect the institutional specificity of each member market of ASEAN. By way of an example, two-thirds of listed Asian companies are controlled by members of the founding families and today represent complex networks of subsidiaries and sister companies with a common controlling shareholder. Nevertheless, the Vietnamese listed companies are the result of a long process of partial privatisation. According to the statistics, the government opened up the capital of 3,619 companies during the 2000-2014 period, but often holds a majority position in capital – nevertheless, in 2014, government ownership was, on average, only 32.79% in the companies listed on the Hồ Chí Minh City stock exchange. As was suggested by research carried out into the emerging markets in Central and Eastern Europe, the analysis of ownership should meet several challenges; (i) understand and codify the details of privatisation programmes (partial privatisation vs. total privatisation; include specific contractual clauses that offer investors the possibility of making investments and capitalising on them in their name after the privatisation); (ii) understand the informal nature of relationships between the shareholders of an industrial group vs. a single company; (iii) capture the diversity of legal nature, namely the French civil law vs. German civil law vs. British common law distinction in multi-country studies notably.

**Shareholding Structure and Performance**

The boom of research into the various issues of governance leads us to raise questions about what aspects should be focused on in this myriad of legal and statutory provisions, the way in which the information is aggregated and especially how it is associated to the creation of value. Surprising as it may seem, only an empirical investigation using real data would bring some elements of response to the question: "What is the relationship between the quality of governance and the value of a company?".

The conclusions of empirical literature studying the impact of ownership structure on the company performance, which we have summarised by way of an illustration in this second part, allow us to understand better the importance of quantitative studies and some methodological issues raised by empirical modelling.

When we wish to assess the effectiveness of the internal governance mechanism we seek to analyse investor capacity, especially that of major shareholders, to ensure a good performance of the company through three essential dimensions: (i) the concentration of capital; (ii) the distribution of voting rights; (iii) the identity of the blockholders.

Any result is a priori possible:

- Concentrated share ownership generates a positive effect on company performance: the argument put forward to justify such a relation lies in the strategic role attributed to large investors (majority position in capital), especially on markets in need of extensive industrial restructuring (exogenous relationship between performance and the measure of governance);
Concentrated share ownership generates a negative effect on company performance: the emergence of severe agency problems within controlled companies is of a nature to justify the existence of significant haircuts in the value of some companies because of the expropriation of the minority shareholders (exogenous relationship between performance and the measure of governance);

- The absence of relationship between the two variables: the ownership structure of each company is optimal because it is the result of market forces. In other terms, while it could be accepted that the large shareholders affect company policies, these shareholders might systematically select the companies they invest in, in function of performance criteria (endogenous relationship between performance and the measure of governance).

The classical empirical strategy is to estimate in panel data company performance in function of governance indicators, while controlling the presence of other influential factors:

$$\text{Performance}_{it} = a_1 \text{ governance indicator}_{it} + \sum_{j=1}^{n} a_j \text{ Control variable }_{it} + \epsilon_{it}$$

The most frequently used performance measures are:

- Return on assets: calculated for each company at the end of each year of the period of analysis, as the ratio between gross profit and total assets;
- Return on equity: calculated for each company at the end of each year of the period of analysis, as the ratio between net profit and equity;
- Tobin’s Q ratio: calculated for each company at the end of each year of analysis period by dividing the sum between the market capitalisation and the book value of debt by the value of the total assets;
- The investment ratio: calculated for each company at the end of each year of the period of analysis, as the ratio between capital expenditure and total assets.

The degree of concentration of share ownership is appreciated in function of the size of ownership rights and, if it is possible to trace back to the ultimate shareholder, the size of voting rights. In the first case, we speak about direct ownership, whereas in the second, indirect ownership.

In order to determine the degree of share ownership concentration, we begin by identifying the capital positions of substantial shareholders – at least for direct ownership – we then aggregate these positions, by constructing:

- A concentration index: the sum of all blocks of substantial shareholders’ capital percentages of shareholders with a significant participation – generally more than 5%;
- The Herfindhal index: the sum of the squares of the blocks of substantial shareholders – this version of the concentration index allocates more significant weight to large shareholders;
- An index measuring the squared difference between two subsequent blocks of substantial shareholders – as in Maury and Pajuste (2005).
Diagram 7. Pyramidal Structures, Multiple and Group

Pyramidal structure of ownership

Ultimate shareholder

35%

Company A

34%

Company B

62.4%

Company C

Ownership rights (B) = 35% * 34% * 62.4% = 7.43%
Control rights = min (35%; 34%, 62.4%) = 34%

Multiple pyramidal structures of ownership

Ultimate shareholder

25%

Company A

11%

Company B

21%

Company C

7%

Ownership rights (B) = 11% * 21% + 25% * 7% = 3.5%
Control rights (B) = min (11%; 21%) + min (25%; 7%) = 18%

Structures of group (subsidiaries)

Ultimate shareholder

25%

Company A

100%

Company B

50%

Ownership rights (A) = 25%
Control rights (A) = 25% + min (25%; 50%; 100%) = 50%

“GAP” index = Ownership rights / Control rights

Source: Almeida et Wolfenzon (2006); Claessens et al. (2000).
To this may be added dichotomous variables in order to identify the type of large shareholder – especially majority shareholders: government, family, company, institutional investor, financial institution or indeed, to identify the origin of this shareholder, whether domestic or foreign.

Shareholder ownership may be strengthened with the help of ownership pyramidal structures or even agreements between several shareholders. In order to highlight the difference between the ownership and control rights that such structures may generate we have used as an example some illustrations proposed by Almeida and Wolfenzon (2006) and Claessens et al. (2000). The reality is nevertheless a lot more complicated than suggested by these simplifying examples, which partly explains why few contributors have, until now, used measures of indirect capital ownership – even for developed markets (see Diagram 7).

Among the control variables, those that are most frequently used are:

- Company size: total assets or market capitalisation or even the total number of employees at the beginning of each year of the period of analysis;
- The financial leverage: calculated as the ratio between debts and equity at the beginning of each year of the period of analysis;
- Asset tangibility: calculated as the ratio between fixed assets and total assets at the beginning of each year of the period of analysis;
- Industrial sector: dummy variable defined by industrial sector;
- The year: dichotomous variable for each year of the period of analysis.

The sense and intensity of each variable on the company’s performance are appreciated in function of their estimated coefficient, if it is statistically significant.

**Transactions between Related Parties**

Existing literature about corporate governance shows that wealth extraction techniques, such as rent appropriation, transactions based on insider dealing and favourable contracts with the State deform company results. Studies carried out on some Asian markets (India, South Korea, Hong Kong, the Philippines, etc.) have highlighted that such practices are so widespread that there is a risk of jeopardising the integrity of the whole market.

Defining a regulatory and legal strategy is by no means easy for the simple reason that there is a priori no way of clearly distinguishing between the decisions taken in the company’s interest and the transactions concluded at the expense of the investor. Facilitating the interaction of supply and demand in the process of price formation depends on the capacity to restrict transactions that are not carried out at arm-length, which leads to their “abusive” character.

The proliferation of abusive transactions increases ex ante the return demanded by investors for the additional risk they run on such markets (which results in a generalised haircut for all companies).
while it is perceived *ex post* as a barrier to the equal treatment of all shareholders[^39] – which, in the long run, leads to market failure.

Among potential abusive transactions, the most problematic are those carried out with related parties, because in this case there is the risk of promoting a pricing policy that is disadvantageous for the company but advantageous for the related parties. A transaction enters into this particular category if the counterparty (i) controls/ is controlled, directly or indirectly, the company/by the company (including the subsidiaries, parent enterprises); (ii) is the partner in a “joint venture”; (iii) is a member of the managing team of the company or the parent company; (iv) is a member of the family of any of the previous mentioned categories, etc. Nevertheless, a client, a supplier or a distributor whose transactions represent a large proportion of the whole of the activity subsequent to a relationship of economic dependence, is not treated as “related party”[^40].

A partial classification of these transactions is detailed in the table below.

<table>
<thead>
<tr>
<th>Nature of the transaction between related parties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase or sale of goods or services</td>
</tr>
<tr>
<td>Purchase or sale of assets and/or properties</td>
</tr>
<tr>
<td>Operating leases</td>
</tr>
<tr>
<td>Other operations: transfer of intangible assets, licences, patents</td>
</tr>
<tr>
<td>Other financial operations grants credits and deposit services</td>
</tr>
<tr>
<td>Agreements to assume certain operational/financial obligations</td>
</tr>
<tr>
<td>Subscription of securities (debt or capital)</td>
</tr>
<tr>
<td>Opening of new partnership entities</td>
</tr>
</tbody>
</table>

*Source: Author’s construction.*

As for pricing policy, let us take the example of a trading operation concerning the purchase of goods or services by another company in the group at a price that is higher than market price. The conditions of this transaction increase expenses, lower profits and, consequently, the dividends likely to be paid-out to the buying company’s shareholders. A low-price sales operation would result in a fall in turnover, profit and dividends but would cause an increase in profit for the related party.

The range of regulatory responses goes from solutions involving legal instruments, such as the obligatory declaration of transactions between the related parties or the explicit prohibition of certain transactions[^41] to a validation system at the company level based on the internal and external monitoring of company activity. Nevertheless, there has not so far been any unitary approach to this

[^39]: The abusive character may consist of a voluntarily erroneous presentation of the company’s performance by the managers who wish to satisfy the market’s expectations at any price.

[^40]: IAS 24 proposes a complete definition of the term “related party” and establishes a list of exceptions.

[^41]: The company is forbidden to grant credits to its director, the controlling shareholder and other initiated staff.
issue. Reflection is enriched by a few stylised facts about markets having addressed the issue of related party transactions.

Thus, an *ex ante* system of protection may be implemented based on rules of communication. According to this system, listed companies must report: the details of each commercial and financial transaction with a related party whose individual or cumulated value over a period of time (generally twelve months) goes beyond a minimal threshold (e.g. USD 50,000); the transactions with company assets exceeding a certain percentage of its net asset value – generally 20%. The divulgation of this information must be either done “continually” within a few days of the completion of the transaction in question, or periodically on an aggregated basis in the company’s annual or twice-yearly audited reports. In the first case, investors on the market can continually learn the details of these transactions, distil the information and immediately integrate it into market prices. The market reaction to their announcement offers an indication of the benign or malign nature of these transactions and allows more detailed discrimination in function of their nature and size.

The issue of related party transactions highlights the vital role that the BD may have in the implementation of good governance. In certain cases, it is necessary for these transactions to be approved by the latter. However, any member who might have conflicting interests should abstain from voting.\[^{42}\] The decision is sometimes made in the GMS, especially for occasional transactions of substantial value. As in the preceding case, if the related party is one of the shareholders, his vote should not be counted in decision-making. The votes of disinterested shareholders in the GMS eliminate the possibility of any challenge from dissatisfied shareholders. The few stylised facts available concerning these practices show that companies that were initially viable were led down the road of bankruptcy by insiders who gradually decapitalised them. In such contexts, legal challenges are unfortunately a waste of time.

By way of a conclusion, the very nature of the subject proposed lends itself more to a reflective exercise and cannot be easily applied to group work. Although certain data, such as financial data, are now available in databases, the key information for the building of a coherent policy, not only at a national level, but also in a heterogeneous regional institutional structure, is still insufficient. At this very moment, international experts are working with different representatives of ASEAN countries to improve their understanding of its specific context. It is necessary to understand the roads that need to be followed in order to ensure the implementation of these principles that would give Asian companies an advantage in the harsh competition for financing on the global market. And with the risk of appearing subjective, we believe that the answers lie in the willingness to gather, on each market, viable data concerning ownership, the evolution of ownership structures and transactions between related parties – crucial information that is currently lacking, in Europe as well – for all companies – given that there are thousands of them. It would be interesting to follow the advancements that will be presented at the round table on Asian corporate governance that will take place in October 2015. Its agenda is at least proof that this subject lies at the core of regulators’ current concerns.

---

\[^{42}\] Even if this rule appears to be common sense, it is hardly automatic!
## Annexe. Questionnaire Related to Governance Issues

<table>
<thead>
<tr>
<th>Which operations necessitate a vote in a General Meeting?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elections of members to the Board of Directors</td>
</tr>
<tr>
<td>The distribution of dividends</td>
</tr>
<tr>
<td>The emission of new shares</td>
</tr>
<tr>
<td>Transactions between related parties</td>
</tr>
<tr>
<td>Merger with another company</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Is the participation of shareholders at the AGM effective?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are shareholders systematically informed about the organisation of the AGM?</td>
</tr>
<tr>
<td>Are several AGMs systematically organised in a coordinated fashion?</td>
</tr>
<tr>
<td>Do shareholders have ex ante access to the AGM agenda?</td>
</tr>
<tr>
<td>Can shareholders vote by post or are represented by a third party?</td>
</tr>
<tr>
<td>Is it easy for shareholders to ask the Board of Directors questions?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Are voting rights equally distributed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many votes are allocated per share for each class of shares?</td>
</tr>
<tr>
<td>Do some shares confer a right of veto in the AGM (in general, so-called “golden shares” held by the government in companies that have been only partially privatised)?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Are minority shareholders protected against insider dealing and abusive transactions between related parties (RPT)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>How are transactions made by insiders or RPT dealt with (manager, controlling shareholder, company staff) – prohibition vs. obligation to divulge information?</td>
</tr>
<tr>
<td>If insider trading must be communicated to the market, what time limits are given to announce these transactions?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How are members of the Board of Directors elected?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can minority shareholders propose representatives to the BD?</td>
</tr>
<tr>
<td>Can the controlling stakeholder appoint all the members of the executive boards including those that are supposed to be independent?</td>
</tr>
<tr>
<td>What is the size of a Board of Directors and how many of its members are independent?</td>
</tr>
<tr>
<td>What criteria is taken into account to qualify a member of the BD as being independent?</td>
</tr>
<tr>
<td>- No ties to the manager?</td>
</tr>
<tr>
<td>- No ties with the controlling stakeholder?</td>
</tr>
<tr>
<td>- Not the representative of another company with which the company represented has significant ties</td>
</tr>
<tr>
<td>Do independent members act independently?</td>
</tr>
<tr>
<td>Are there a maximum number of terms?</td>
</tr>
<tr>
<td>Is the Chairman of the BD also the Chief Executive Officer of the company?</td>
</tr>
</tbody>
</table>
References


2.1.2. The Sovereign Debt Crisis in Europe: Implications for the Future of Financial Integration and Monetary Cooperation in ASEAN

The crisis of the world financial system that started in the summer of 2007 has had devastating and persisting effects on real economies, in almost all countries. Although the epicentre of the crisis was located in a well-developed country, the United States, it spread quickly through contagion to other countries that were interconnected to the global economy. Thus, the Asian economies that were most open to international trade, for example, were severely affected by the financial crisis, mainly through the trade channel. At a global level, according to International Monetary Fund (IMF) estimates, one-fifth of the planet’s gross domestic product (GDP) disappeared during the crisis period. Indeed, in most countries the public authorities were quick to react, and the methods used to resolve the dysfunctions of the financial system finally proved to be very costly: public funds injections into the troubled banks in order to recapitalise them; “toxic” financial assets relief programs in order to improve the financial conditions of (otherwise) insolvent “systemic” institutions; blanket
guarantees granted to large creditors and (uninsured) depositors of systemically important banks; liquidity facilities generously granted by central banks, etc.

**Graph 11. Massive Public Support to European Financial Sectors (% of GDP)**

The recessionary effect of the financial and banking crisis has been propagated to the real economy. Thus, growth forecasts have been regularly revised downwards and the macroeconomic environment substantially deteriorated after the crisis. “Credit crunch” phenomena, during which the credit distributed by banks to the private sector contracts significantly, have been observed in most developed countries. The fiscal costs of resolving the crisis have overstretched national budgets. Public deficits have widened in most countries and revealed severe insolvency problems at the sovereign level, notably in Europe. The deterioration of the macroeconomic conditions and the spectacular rise in unemployment has only served to make things worse and amplify the initial recessionary shock (see Graph 12).

The objective of this chapter is, first of all, to take a quick look at the real macroeconomic effects of financial crises. Secondly, we will describe the main causes of the sovereign debt crisis in Europe. The implications of the sovereign debt crisis for the future of financial integration and monetary cooperation in ASEAN will then be discussed. Finally, the last session will propose some concluding remarks.
Macroeconomic Effects of Financial Crises

Given the crucial role of banks within the financial system, when their financial situation deteriorates subsequent to the outbreak of a financial crisis, the macroeconomic environment deteriorates in turn. The study of the macroeconomic effects of banking and financial crises that occurred in the past shows significant and persistent declines in asset prices, particularly in real estate and stock prices, after periods of crisis (see for example Reinhart and Rogoff, 2009a, 2009b, and the reference therein). For illustration purposes, the real estate prices fall by 35% on average over a five-year period before and after systemic crises, while the decline observed in the stock prices is relatively more spectacular (55% on average), but over a shorter period, of three to four years.

In the same vein, we observe a significant rise in unemployment and a significant fall in output: the real per capita GDP falls by more than 9% on average. At the same time, public deficits widen because of the combined effect of two main factors. Firstly, because of the fall in output and economic activity, the fiscal base is eroded. Secondly, the pressure of public deficits is also explained by the rise in public spending caused by fiscal stimulus packages, accommodative fiscal policies, financial support to banks and other financial intermediaries, etc. As the reported descriptive statistics show (see Graph 11), there was massive public support for the financial sector in several European countries. To give only one extreme example, the package of support measures to Irish financial institutions during the recent crisis – government guarantees, recapitalisation of troubled banks, bailouts, etc. – amounts to approximately 270% of the GDP. The effect of these measures on the public deficit is thus significant. For illustration purposes, Sweden reported a budget surplus of about 4% of GDP before the crisis it went through at the beginning of the 1990s. After the crisis, the Swedish budget deficit increased to 15% of the GDP (see Table 15).
Shared Challenges for Development within ASEAN

Table 15. Effect of Financial Crises on the Budget Deficit

<table>
<thead>
<tr>
<th>Country, year of crisis</th>
<th>Year preceding the crisis</th>
<th>Deficit peak (year)</th>
<th>Variation of the budget deficit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentina, 2001</td>
<td>-2.4</td>
<td>-11.9 (2002)</td>
<td>9.5</td>
</tr>
<tr>
<td>Chile, 1980</td>
<td>4.8</td>
<td>-3.2 (1985)</td>
<td>8.0</td>
</tr>
<tr>
<td>Colombia, 1998</td>
<td>-3.6</td>
<td>-7.4 (1999)</td>
<td>3.8</td>
</tr>
<tr>
<td>Finland, 1991</td>
<td>1.0</td>
<td>-10.8 (1994)</td>
<td>11.8</td>
</tr>
<tr>
<td>Indonesia, 1997</td>
<td>2.1</td>
<td>-5.7 (2001)</td>
<td>5.8</td>
</tr>
<tr>
<td>Japan, 1992</td>
<td>-0.7</td>
<td>-8.7 (1999)</td>
<td>9.4</td>
</tr>
<tr>
<td>Korea, 1997</td>
<td>0.0</td>
<td>-4.8 (1998)</td>
<td>4.8</td>
</tr>
<tr>
<td>Malaysia, 1997</td>
<td>0.7</td>
<td>-5.8 (2000)</td>
<td>6.5</td>
</tr>
<tr>
<td>Mexico, 1994</td>
<td>0.3</td>
<td>-2.3 (1998)</td>
<td>2.6</td>
</tr>
<tr>
<td>Norway, 1987</td>
<td>5.7</td>
<td>-2.5 (1992)</td>
<td>7.9</td>
</tr>
<tr>
<td>Spain, 1977</td>
<td>-3.9</td>
<td>-3.1 (1977)</td>
<td>-0.8</td>
</tr>
<tr>
<td>Sweden, 1991</td>
<td>3.8</td>
<td>-11.6 (1993)</td>
<td>15.4</td>
</tr>
<tr>
<td>Thailand, 1997</td>
<td>2.3</td>
<td>-3.5 (1999)</td>
<td>5.8</td>
</tr>
</tbody>
</table>

Source: Reinhart and Rogoff (2009b).

Obviously, the running up of public deficits during crisis years results in a significant increase of public debt. The cumulative effect on public debt during the three years following a systemic crisis runs to 86% on average (see Graph 13). The deterioration in the government’s budget leads to a rise in the sovereign risk, to a possible downgrade of the sovereign credit rating, to a rise in the likelihood of default and, in fine, to a rise in the cost of debt (i.e. in the risk premium).

Graph 13. Cumulative Effect of Financial Crises on Public Debt after Three Years

Source: Reinhart and Rogoff (2009b).
From the Banking Crisis to the Sovereign Debt Crisis in Europe

One of the most surprising paradoxes related to the sovereign debt crisis is that the most severe crisis in the history of the European Union (EU) had its epicentre in a small peripheral member country, Greece, which only accounts for less than 2% of the euro zone GDP (De Grauwe, 2012). The aim of this section is to understand how the initial shock wave, the Greek crisis, spread to other member countries and has endangered even the future of the European Union. The objective is thus to decipher the contagion effect and to understand its main causes.

Let us first sum up briefly the facts. In autumn 2009, the countries forming the heart of Europe were preparing the way out of the financial crisis when the new Greek socialist government, which had just been elected in November 2009, revealed a public deficit for the year 2009 of more than 12% of the GDP, that is twice as high as that announced by the previous government. The bad macroeconomic news did not take long to produce effects. For the first time in ten years, the rating agencies downgraded Greece to a “BBB+” rating, that is short of the boundary that separates Investment Grades from speculative investments (Junk Bonds). The financial markets panicked, the yield on Greek debt securities drastically increased, thus placing a greater burden on sovereign debt and increasing the risk of a Greek default. In such conditions, the refinancing of the Greek debt became a challenging issue. The first rescue package, of a total amount of EUR 110 billion over three years, approved in May 2010 by the EU and the IMF, was made more generous in October 2011 – EUR 130 billion. This, however, was not enough to calm down the markets and prevent the threat of a confidence crisis of propagating to other so-called peripheral countries in the euro zone: Portugal, Ireland, Italy, and Spain. The financial markets penalised these countries by demanding higher risk premia for the risk of default, which has now became much higher. The confidence crisis revealed serious failures in the EU’s institutional design and major imbalances in the member countries.

The contagion effect observed after the Greek crisis has a dual nature.

Firstly, as we have just described, the Greek crisis spread, through the financial markets, to other member countries whose budget situation was intrinsically fragile. The investors who had already suffered substantial haircuts on Greek bonds quickly got rid of the debt securities issued by the other States affected by the confidence crisis, thus increasing the burden of public debt. These movements of panic generated self-fulfilling prophecies that had devastating effects on the budget situation of the most fragile countries.

Secondly, the contagion spread through the existing direct and indirect links between the government bond market and the banking sector. In each country, large portions of public debt are held by banks and other financial institutions.
Table 16. Shares of Public Debt held by Banks (billions of euros)

<table>
<thead>
<tr>
<th>Held by the banks of:</th>
<th>Austria</th>
<th>Belgium</th>
<th>Germany</th>
<th>Spain</th>
<th>Finland</th>
<th>France</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>14.59</td>
<td>0.44</td>
<td>1.44</td>
<td>0.21</td>
<td>0.12</td>
<td>0.40</td>
</tr>
<tr>
<td>Belgium</td>
<td>2.22</td>
<td>29.60</td>
<td>13.72</td>
<td>2.87</td>
<td>0.25</td>
<td>3.76</td>
</tr>
<tr>
<td>Germany</td>
<td>11.28</td>
<td>6.49</td>
<td>315.31</td>
<td>18.61</td>
<td>0.80</td>
<td>13.57</td>
</tr>
<tr>
<td>Spain</td>
<td>0.13</td>
<td>0.72</td>
<td>2.17</td>
<td>222.82</td>
<td>0.50</td>
<td>3.82</td>
</tr>
<tr>
<td>Finland</td>
<td>0.00</td>
<td>0.15</td>
<td>0.18</td>
<td>0.00</td>
<td>0.41</td>
<td>0.19</td>
</tr>
<tr>
<td>France</td>
<td>4.86</td>
<td>33.04</td>
<td>45.59</td>
<td>14.63</td>
<td>2.34</td>
<td>118.26</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2.09</td>
<td>6.32</td>
<td>35.51</td>
<td>12.35</td>
<td>1.52</td>
<td>45.70</td>
</tr>
<tr>
<td>Greece</td>
<td>0.02</td>
<td>0.00</td>
<td>0.41</td>
<td>0.00</td>
<td>0.00</td>
<td>0.16</td>
</tr>
<tr>
<td>Hungary</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Ireland</td>
<td>0.48</td>
<td>0.21</td>
<td>0.60</td>
<td>0.33</td>
<td>0.04</td>
<td>1.20</td>
</tr>
<tr>
<td>Italy</td>
<td>3.27</td>
<td>0.39</td>
<td>20.41</td>
<td>3.23</td>
<td>0.11</td>
<td>0.82</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Held by the banks of:</th>
<th>United Kingdom</th>
<th>Greece</th>
<th>Ireland</th>
<th>Italy</th>
<th>Netherlands</th>
<th>Portugal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>0.01</td>
<td>0.46</td>
<td>0.05</td>
<td>1.20</td>
<td>0.12</td>
<td>0.14</td>
</tr>
<tr>
<td>Belgium</td>
<td>0.15</td>
<td>3.91</td>
<td>0.27</td>
<td>21.40</td>
<td>0.36</td>
<td>2.09</td>
</tr>
<tr>
<td>Germany</td>
<td>7.22</td>
<td>7.93</td>
<td>1.01</td>
<td>36.82</td>
<td>4.39</td>
<td>3.58</td>
</tr>
<tr>
<td>Spain</td>
<td>4.41</td>
<td>0.45</td>
<td>0.08</td>
<td>7.20</td>
<td>0.34</td>
<td>4.85</td>
</tr>
<tr>
<td>Finland</td>
<td>0.00</td>
<td>0.00</td>
<td>0.04</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>France</td>
<td>8.62</td>
<td>10.07</td>
<td>2.11</td>
<td>53.00</td>
<td>13.66</td>
<td>4.75</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>120.16</td>
<td>2.71</td>
<td>1.27</td>
<td>26.37</td>
<td>12.07</td>
<td>2.65</td>
</tr>
<tr>
<td>Greece</td>
<td>0.00</td>
<td>54.45</td>
<td>0.02</td>
<td>0.10</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Ireland</td>
<td>0.00</td>
<td>0.00</td>
<td>12.47</td>
<td>0.85</td>
<td>0.52</td>
<td>0.24</td>
</tr>
<tr>
<td>Italy</td>
<td>3.15</td>
<td>0.04</td>
<td>0.17</td>
<td>164.01</td>
<td>0.17</td>
<td>0.37</td>
</tr>
<tr>
<td>Netherlands</td>
<td>0.12</td>
<td>1.41</td>
<td>0.44</td>
<td>10.18</td>
<td>45.22</td>
<td>0.84</td>
</tr>
<tr>
<td>Portugal</td>
<td>0.00</td>
<td>0.00</td>
<td>0.52</td>
<td>1.02</td>
<td>0.01</td>
<td>19.57</td>
</tr>
</tbody>
</table>

*Source: European Banking Authority.*

These holdings of sovereign debt were both crossed (*e.g.* Greek securities for example were held by banks and other private investors headquartered in other countries, in Germany, in France, etc.) and direct (*e.g.* Greek bonds were held by Greek banks, etc.).
When the price of these debt securities fell on the stock exchange, the financial institutions that held them in their portfolios suffered losses and saw their financial situation considerably deteriorate. This exacerbated the insolvency problems of the banking systems and justified further public interventions to save troubled banks, which in turn, like a boomerang effect, precipitated the deterioration of the sustainability of public debt.

In order to summarise and gain a better grasp of this doom loop between sovereign risk and banking risk, it is necessary to describe four transmission channels, whose action is complementary:

- The asset portfolio channel: government bonds held by banks lose value and thus affect the financial situation of banks leading to a rise in their cost of financing;

- The collateral channel: banks often use government bonds as collateral in refinancing operations on the interbank market or with the central bank. Consequently, the erosion of the collateral value due to an increase in sovereign risk leads to a rise in the cost of financing for banks and/or rationing on various markets;

- The credit rating channel: in practice, the sovereign rating acts as a ceiling for private issuers. In other words, if the sovereign is downgraded, this translates several months later in a chain downgrading of credit ratings assigned to other private issuers, including banks;

- The public guarantee channel: the deterioration of the government’s financial situation undermines its capacity to provide credible financial aid to financial institutions judged to be systemic by the market. This results in an increase in the insolvency risk of banks as well as their financing costs.
From an empirical point of view, some recent studies show the relevance of these various transmission channels. Thus, the banks most exposed to sovereign risk – those banks that held large shares of debt instruments issued by sovereigns in difficulty – reduced relatively more – by 20% to 25% more! – their loan supply, compared with “non-exposed” banks (Acharya et al., 2015; Popov and Van Horen, 2015; De Marco, 2016). In the same vein, the banks that were the most exposed to sovereign risk suffered a larger decline in value on the stock market, compared to their relatively less exposed peers (Arezki et al., 2011). Finally, it appears that the banks that were the most exposed to sovereign risk were confronted with more severe runs by depositors, once again in comparison with their competitors who were relatively little exposed to this kind of risk (Correa et al., 2012) (see Graph 15).

Admittedly, the contagion from one country to another within the euro zone was facilitated by financial integration, on the one hand, and by the absence of a credible mechanism for the effective management of crises within the Union, on the other hand. Indeed, given the institutional architecture of the euro zone, the possibility of operating financial transfers from financially sound countries towards countries in difficulty was not foreseen. Furthermore, the founding Maastricht Treaty posits the “no bailout clause” principle, according to which the member States cannot assume the debt of another member State. When the Greek crisis reached its height, at the beginning of 2010, the other member States therefore had no institutional tool at their disposal to react promptly and appropriately (see Graph 16).
Graph 15. Flights of Deposits by Country

Source: Statistics published by Central European Banks.

Graph 16. Convergence of Interest Rates after the Changeover to the Euro

Source: Statistics published by Central European Banks.
Another important fact to understand the roots of the sovereign debt crisis is the surprising alignment of government yields in various member countries of the Union since the arrival of the euro at the beginning of the 1990s. As the graph shows, the alignment of yields was towards the lowest one; in other words, the government yields of member States converged towards the German yield, the lowest one, the yield associated with the public debt of the healthiest State from a financial point of view. For illustration purposes, three months after its entry into the euro zone, the Greek yields fell from 22% to 3% per year, the Spanish and Italian yields from 15% to 3% and the Irish yields from 20% to 3%. This alignment is quite paradoxical given the strong heterogeneity of the euro zone in terms of comparative advantages and initial endowment in factors of production (human capital; degree of industrialisation; productivity; per capita income; etc.). By way of a comparison, before the crisis, the industry accounted for 7% of the GDP in Greece, 12% in France and Spain, and 21% in Germany. In the same vein, per capita income was EUR 31,000 in Germany, EUR 22,000 in Spain, and EUR 20,000 in Greece. The very low yield and interest rate levels fed bubbles on the credit and real estate markets. Between 1995 and 2008, real estate prices were multiplied by 4.7 in Ireland, by 3.5 in Greece, by 3.6 in Spain, by 2.8 in Italy, and by 1.8 in Portugal.

Graph 17. Growth Rate of Banking Credit in Europe

Source: De Grauwe (2012).
As shown in Graph 18, excessive indebtedness facilitated by easy credit and low interest rates contributed to the rise in real estate prices and the formation of speculative bubbles in real estate markets, at least in Spain and Ireland. With the benefits of hindsight, cheap credit over several decades led to an unsustainable accumulation of both private debt (in countries like Ireland, Portugal, and Spain) and public debt (in countries like Greece and Portugal).

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<th>Table 17. Variation of the Public and Private Debt Ratio 1999-2007</th>
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<td><strong>Ratio of public debt (variation in %)</strong></td>
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<td>1999</td>
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<td>Ireland</td>
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Source: De Grauwe (2012).
allowed them to benefit from the excessively low interest rates and yields, which fed excessive growth that finally turned out to be unsustainable.

**Implications of the Euro Crisis for the Future of Monetary Cooperation and Financial Integration in ASEAN**

Compared with the economies of Western countries, Asian economies were affected by the 2007 financial crisis with some delay. The main channel for the diffusion of the crisis in this region of the world was through international trade and commercial exchanges. The global demand contracted sharply in the vast majority of developed countries, which led to a slump in Asian exports to the rest of the world and, consequently, to a fall in output and aggregate income. From a strictly financial point of view, the banks headquartered in Asia were in some way unscathed by the crisis. Indeed, they were quite well capitalised before the crisis broke and held traditional asset portfolios, oriented towards local markets, and few investments in highly speculative financial assets issued in international capital markets.

Before the inception of the sovereign debt crisis, the EU was often considered to be a good example of monetary, financial, and economic integration and a source of inspiration for other countries and regions of the world. The crisis radically changed the stakes and revealed several serious failures in the institutional design of the EU that constitute warning signals for the rest of the world.

What lessons can be learnt from this painful European experience whose causes were briefly outlined in the preceding section?

We are going to insist here on five main lessons (for complementary discussions, also see Eichengreen, 2011; Kawai et al., 2015; Volz, 2012): (i) the necessity of adopting a gradual approach to financial integration and monetary cooperation that takes into account the degree of heterogeneity between the different countries in the region; (ii) the need for a more realistic debate about the claimed advantages, as well as the possible dangers, inherent to financial integration; (iii) the necessity of configuring an effective framework for the prevention and resolution of financial and banking crises in order to limit the damage caused by future crises to the real economy; (iv) the reform of financial regulation; and (v) the conception of credible *ex ante* action plans, coordinated at a regional level and implemented simultaneously during crisis periods.

Firstly, the Achilles’ heel of the European institutional architecture, as revealed by the sovereign debt crisis, was without any doubt the absence of credible insurance mechanisms, mutual assistance, and financial solidarity between the members of the EU. Indeed, although there is only one monetary policy in the euro zone, the fiscal policies and government budgets have essentially remained national. The absence of such mechanisms, which were utterly desirable at the beginning of the crisis, led to a contagion dynamic from Greece to other fragile member countries: Ireland, Spain, and Portugal. The absence of a “political” union and a credible financial solidarity between countries exacerbated the initial shock wave and sowed the seeds of the confidence crisis in the financial markets. In order to understand this failure in the European architecture, it is worth mentioning here the fear expressed by some countries, among which Germany, the Netherlands, the Scandinavian countries, with respect to the moral hazard generated by financial solidarity with other countries whose financial health was fragile. Moreover, as the literature on optimal currency
areas shows, an increased heterogeneity between member countries may lead to an accumulation of macroeconomic imbalances within the Union that might lead to crises. Finally, although the degree of economic and commercial integration between the member countries of ASEAN is quite high, the cultural divergences and institutional heterogeneities are much stronger than in Europe. From a governance point of view, the European Commission benefits from a budget of around EUR 4 to 5 billion and employs a staff of more than 35,000, whereas the ASEAN secretariat based in Jakarta operates with a much lower budget – USD 20 million – and only employs a few hundred staff. The first lesson from the sovereign debt crisis in Europe, and implicitly from the euro crisis, is that political decision makers should adopt a gradual approach to financial integration and monetary cooperation that takes explicitly into account the degree of heterogeneity characterising the various member countries of ASEAN. The idea that the implementation of a monetary union would automatically lead to a strengthening of economic and commercial integration through a natural convergence process should be considered as being a chimera and should, for this reason, be abandoned.

Secondly, we have all too often exaggerated the benefits of financial integration while at the same time underestimating its costs and dangers. Particularly, as revealed by the 1997-1998 Asian crisis, financial integration may lead to the accumulation of macroeconomic imbalances, to unsustainable government budgets, to bubbles in different markets and sudden reversals of short-term foreign capital flows. The increased interconnection between countries, which is stimulated by an increasing degree of financial integration, might exacerbate systemic risk and cross border contagion effects. The shocks are thus more easily transmitted from one banking system to another and thus from one country to another. For this reason, the monitoring and guidance of cross-border financial transactions and capital flows should be adapted to keep the pace with financial integration.

One of the reasons the sovereign debt crisis in Europe as well as the Asian crisis in the 1990s were so costly lies in the lack of coordination of public powers when it came to crisis management. In East Asia, the Chiang Mai initiative, which was initially adopted in 2002, and especially its "multilateral" version of 2010, both constitute important steps in the right direction, notably aiming to strengthen financial solidarity within ASEAN during periods of crisis (Kawai et al., 2015). Nevertheless, the global financial crisis of 2007 revealed some major failures in the architecture of this mutual support mechanism between the member States of ASEAN+3. In particular, the portion of the liquidity facility that a country may use when a crisis occurs, without being compelled to implement structural adjustment programmes similar to those imposed by the IMF, is too small – about 30% to 40% of the maximum quota – when compared to each country's needs. For illustration purposes, this portion for Thailand and South Korea was set at USD 9.01 billion and USD 15.36 billion, respectively – if we suppose that the ceiling is set at its maximum, that is at 40% of the quota applied to each of the two countries. These amounts are clearly insufficient if we compare them to the facilities granted by the IMF to Thailand during the Asian crisis in the 1990s – USD 17.2 billion – or to the amount of the bilateral swap contract signed by South Korea with the US Federal Reserve during the 2007 financial crisis – USD 30 billion. It is also worth noting that during the 2007 financial crisis the aggregated value of all bilateral swaps contracted outside the Chiang Mai initiative, in its multilateral version, rose to more than USD 205 billion – of which USD 90 billion came from the US Federal Reserve. The so-called “regional” bilateral swaps, between the member countries
of ASEAN+3, only represented less than 5% of the cumulated foreign exchange reserves of the seven countries concerned, namely China, Hong Kong, Indonesia, Japan, South Korea, Malaysia, and Singapore (Kawai et al., 2015, chapter 4). Naturally, we might raise the question as to why the ASEAN+3 member countries preferred to contract foreign currency swaps outside the region, that is, outside the Chiang Mai initiative.

The answer lies in the stigma associated with the conditionality inherent to the IMF-type structural programmes in the Chiang Mai initiative. The mechanism at work is similar to that observed during the 2007 financial crisis in the United States, when the largest banks refrained from using discount window facilities from the Federal Reserve or receiving public fund injections for fear of being stigmatised in financial markets. Given that the Chiang Mai initiative, in its most recent multilateral version, turned out to be ineffective in the context of the recent financial crisis, the question is how to improve its effectiveness. We advocate for the introduction of more flexibility in the Chiang Mai initiative in order to make it operational. In particular, this would mean significantly increasing the portion of the facility disconnected from the structural adjustment constraint to well beyond the current threshold, of 30% to 40% of the quota, especially in case of a systemic crisis. This modification cannot be made in the absence of an effective monitoring mechanism, such as the ASEAN+3 Macroeconomic Research Office (AMRO), as a tool against moral hazard problems.

The 2007 financial crisis, as well as the 1997-1998 Asian crisis, both showed that contagion effects could quickly spread from one country to another in the context of a generalised confidence crisis. Hence, the need for an incentive-compatible regulatory framework, both micro and macro-prudential, to fight effectively against these phenomena. In the EU, a large-scale reform project was launched just after the sovereign debt crisis: the Banking Union. This project is based on four main pillars whose effectiveness is yet to be proven during the prevention and resolution of future financial crises:

- The single supervisory mechanism, whose role is to supervise, on a centralised basis, the largest banks in the euro zone;
- The single resolution mechanism, whose objective is to guarantee an orderly resolution of troubled banks by reducing to a minimum the effect of a bank failure on other financial institutions and the real economy;
- The European deposit guarantee scheme, whose aim is to ensure equal protection of depositors, whatever member state is faced with a confidence crisis.

At the same time, European banks are making sustained efforts to apply the new Basel capital accord – also called Basel III. The new capital accord, which will be gradually implemented until 2020, aims at strengthening the capacity of banks to absorb shocks and manage liquidity risks. In East Asia, the ASEAN+3 Macroeconomic Research Office (AMRO), created in Singapore in 2011, assumes a supervisory role at the regional level and without any doubt constitutes a very useful initiative. However, compared to the single supervisory and resolution mechanisms in Europe, AMRO benefits from far fewer financial and human resources. As for deposit guarantees, the reality is very heterogeneous within ASEAN. To give just one example, Cambodia has not yet a deposit insurance system and in other countries where such systems exist, the coverage ceilings, as well as the design of the system,
Logistical, Financial and Economic Integration in ASEAN

significantly differ from one country to another. The same is true as far as the implementation of the Basel capital accords is concerned. In the most developed countries in the region, the banks are preparing to implement the new Basel III accord, whereas in other countries, where the financial infrastructure is still developing – Cambodia, Laos, and Myanmar – regulators are applying solvency standards inspired by the first, Basel I, accord, which entered into force in the Western world at the beginning of the 1990s. Consequently, much more remains to be done to improve the macro-economic and financial stability, as well as the regulation of financial markets and institutions in ASEAN.

Finally, the regulatory forbearance during the past financial crises has always been a source of ineffectiveness. By way of an illustration, the regulatory forbearance during the S&L crisis in the United States at the end of the 1980s, the passivity of Japanese regulators and supervisors with respect to the accumulation of doubtful loans during the so-called "lost decade" (1990), and the timid and improvised response of the EU member States at the very beginning of the Greek crisis have only contributed to adding to the final bill that was paid by the taxpayers. Hence, the need to conceive ex ante credible and coordinated action plans at the regional level that will be applied efficiently during crisis periods.

\begin{quote}
\textbf{Applications in the workshop}
\end{quote}

Overview of the measures concerning the degree of financial integration:

- Heightening the trainees' awareness of the importance of the building and exploitation of databases (both microeconomic and macroeconomic ones) in banking and financial economics;

- Presentation of the principal banking-finance databases: Bloomberg, Datastream Thomson Financial, Reuters, Bankscope;

- Presentation of a data processing programme – STATA, version 14.0 (menus, windows, command syntax, computing power, capacities, different statistical tools);

- Data importation procedures, construction of tables containing descriptive statistics, modelling of links using the ordinary least squares (OLS) method and the maximum likelihood (ML) method, simple linear method, binary model applied to off-site banking supervision (estimation by national banking system of the probability of the deterioration of the financial conditions of banks using a simple model);

- Basis used: gathering of micro-banking data taken from the financial reports of the largest banks domiciled in ASEAN member countries, cleaning and processing of the base, construction and interpretation of profitability and banking performance ratios (asset quality), solvency and liquidity ratio, statistical inferences, economic interpretation of the obtained results.
Conclusion

Our presentations deal with a current topic that is rich in lessons for the future of financial integration and monetary cooperation in ASEAN: the sovereign debt crisis in Europe. We began by explaining the real macroeconomic effects triggered by financial crises. We then described the causes behind the sovereign debt crisis in Europe by insisting on the mechanisms inherent to the sovereign risk/banking risk “toxic” spiral. Finally, we spoke about several implications of the sovereign debt crisis for financial integration and monetary cooperation within ASEAN. We particularly advocate a progressive approach to financial integration in ASEAN that takes into account the different degrees of development and the institutional and cultural heterogeneities that characterise the countries of the region. We also recommend a more realistic analysis of the advantages associated with financial integration. The dangers of financial integration – financial contagion, systemic risk, volatility of capital flows, asset price bubbles, etc. – are often underestimated in the debates surrounding the costs and benefits linked to financial integration. The sovereign debt crisis in Europe also revealed the urgent need to conceive effective micro-prudential systems for the prevention and resolution of financial crises. From this point of view, in-depth reform of financial regulation has become a necessity. Finally, the conception of credible action plans at the regional level, whose implementation would be carried out in a concerted manner in periods of crisis, will contribute, we hope, to contain the adverse effects of future crisis.

References


Banque de France (2010), « De la crise financière à la crise économique », Documents et Débats, n° 3.

Banque de France (2009), « La crise financière», Documents et Débats, n° 2.


Thursday 23rd and the morning of Friday 24th were facilitated by Ruth Banomyong. The presentation globally concerned the logistical development policy in ASEAN and particularly the concept and theories of logistics and the supply chain, as well as the microeconomic approach on the national plan scale for the development of logistics. We refer the reader to the session entitled “A logistical approach to corridors” developed by Ruth Banomyong in the framework of the workshop “Development corridors in ASEAN” in the present publication.

With the help of the three trainers, the afternoon of the last day was devoted to the preparation of Saturday’s summary and feedback session.
## List of trainees

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2.2. Epidemiological Risks and Integration of Health Policies on a Regional Scale: Modelling to Make Better Decisions

Marc Choisy – IRD, Alexis Drogoul – IRD, Benoît Gaudou – University of Toulouse, Nicolas Marilleau – IRD, Damien Philippon – University de la Rochelle, Trương Chí Quang – University of Cần Thơ, Võ Đức Ân – University of Đà Nẵng

(Transcript)

Day 1, Monday 20th July

2.2.1. General Introduction to the Workshop

The first part of the workshop is devoted to the introduction of the trainers and trainees (see trainers’ biographies, list of trainees inserted at the end of chapter).

[Alexis Drogoul]

We are going to work on the study of dengue in Southeast Asia in order to understand the consequences and impacts of regional integration on the epidemiology of this virus. It is necessary to point out that it is a vector-borne disease that is principally linked to two species of mosquitoes; Southeast Asia bears 80% of the world’s costs linked to the disease. Marc Choisy will present in detail the characteristics of dengue.

There is currently no treatment for dengue and available vaccines are still being tested. The only possible way of fighting the disease is to control its vector, the mosquito (or its larvae or eggs).
There are at least two factors that allow us to explain the appearance of this disease and its annual resurgence: temperature and rainfall.

Source: Author’s construction; Shepard et al. (2013).
We are going to mainly focus on the role human activity plays in the disease (see Diagram 11). Let us note that a person carrying the virus is going to infect the mosquitoes that bite that person; human activity creates ideal ecosystems for mosquitoes, particularly because of urbanisation and the development of a certain number of industrial activities; finally, individuals travel long geographical distances, which particularly allows the vector to travel. (see Graph 19)
Shared Challenges for Development within ASEAN

**Diagram 11. Anthropic Factors**

- People infect mosquitoes

- People create "ideal" ecosystems, especially with the urbanization of South-East Asia

- People travel long distances

Source: Author's construction.

**Graph 19. Economic Integration and the Case of Dengue**

Number of cases

- Dengue cases (x 1000)
- Intra-Asia Trade (USD 10bn)
- Intra-Asia tourism (x 100k)

Source: Author's construction.
There is an apparent correlation between the number of cases of dengue, inter-Asian trade and the number of Asian tourists visiting Asia. Even though a correlation is not a causal relationship, it is still interesting to specify the incidences and reciprocal impacts of these different phenomena. Indeed, in spite of the global threat that dengue represents for Southeast Asia, ASEAN countries have not really succeeded in coordinating their policies.

We are going to examine three main questions by basing ourselves on computer and mathematical models:

- What is the impact of the growth of trade in ASEAN countries on the dengue epidemic?
- Would coordination between the countries concerned be beneficial in terms of reducing the number of people infected?
- What type of coordination would then be necessary – in terms of finance, a timetable for combating the disease, and control policies?

The models that we are going to build will allow us to:

- Better understand the combination of human and vectoral dynamics;
- Anticipate the potential changes in these dynamics in function of the changes in economic and environmental contexts;
- Depict and analyse the impact of government control policies;
- Use tools of exploration and experimentation for the coordination of control policies.

We chose first of all to limit the geographical scale and focus of all the models in order to concentrate on a particular case of exchanges between countries in the ASEAN zone: the East-West corridor between Đà Nẵng and Moulmein (Myanmar).

The methodological and conceptual approaches for the construction of the models will be developed during the week either in lectures or in the form of practical sessions. The last two days will be devoted to group work (see Diagram 12).
Diagram 12. Workshop Structure

2.2.2. Epidemiological Models

[Marc Choisy]

My presentation focuses on the following three general points: dengue, modelling and epidemiological modelling.

**Dengue**

Dengue is a so-called “neglected” tropical disease. The first cases of dengue appeared in Southeast Asia in the 1950s, then the disease spread throughout the tropical world.

In Southeast Asia, dengue is a major public health issue – an estimated half a billion cases each year. Africa appears to be relatively little affected in comparison to the rest of the tropical world, but there is a surveillance problem there in so far as the symptoms are often confused with malaria (or paludism).
Dengue has the characteristic of being transmitted by bites by the female of the *Aedes* genus, principally two species: *Aedes aegypti* and *Aedes albopictus*. *Aedes aegypti* is a species that originated in Africa, which then spread throughout the tropical world mainly by the international movement...
of goods generated by human trade. *Aedes albopictus* is a species of Asian origin that is currently following a similar trajectory. The first species is, however, more competitive than the second: in many places where the two species are present, *aegypti* tends to replace *albopictus*; *aegypti* is also a better vector of the virus.

In Việt Nam, *albopictus* is essentially found in the north and *aegypti* is in the process of invading the rest of the country from the south.

*Map 15. A Vector-borne Disease (2)*

These two species are anthropophile and urban – unlike malaria-bearing mosquitoes, dengue-bearing mosquitoes need relatively clean water and only need a small quantity of water to lay their eggs.

The principal method of controlling dengue lies in mosquito populations. The virus is transmitted to people and also from people to mosquitoes when they bite. Understanding the demography of mosquito populations is thus fundamental to understanding the transmission of dengue.
One of the methods of controlling a dengue epidemic is to spray insecticides in and around houses. The objective is to principally eliminate adult mosquitoes that can transmit dengue through their bite. A second strategy is the prevention of epidemics essentially on mosquito larvae and not on adults – use of chemical insecticides, aquatic crustaceans (Copepods) or even guppy fish that feed on mosquito larvae – there is currently a World Health Organization (WHO) programme in Southeast Asia to diffuse this type of fish.

Two other strategies are also being studied: the genetic modification of mosquitoes to make them less likely to transmit the virus; the use of *Wolbachia*, a bacteria that competes with the virus inside the mosquitoes. The difficulty with these two methods is ensuring that the genetically modified organisms and the *Wolbachia* spread throughout the natural mosquito populations – let us note that *Wolbachia* in the natural environment is currently being tested in ten sites around the world, one of which is in Viêt Nam on Tri Nguyen Island, off the coast of Nha Trang.

The last dengue prevention policy is likely to be vaccination, if the vaccine promised by Sanofi is indeed put on the market in 2016.

Let me finish by reminding you that dengue is characterised by a wide range of symptoms, which range from asymptomatic cases to death.

**Modelling**

Models all share a simplified representation of a complex reality. Our brains are not, unfortunately, wired to understand the complexity of the world we live in: we need models that simplify reality in order to help us understand it.

**Diagram 14. Mathematical, Statistical, Computational Models**

We are going to focus on mathematical, statistical and computer-based models; there are two approaches that are traditionally identified: the phenomenological approach and the mechanistic
one. Statistical models typically have a phenomenological approach; mathematical models have a mechanistic one. These differences are in fact the result of different objectives: statistical methods mainly focus on prediction, whereas mathematical ones mainly focus on the understanding of mechanisms.

Imagine that you want to study the growth of a population over a period of time.

**Graph 20. Phenomenological Model**

The statistical approach consists of obtaining data. The important thing is that we focus on the links between the variables and not on the cause of these links. In this case, the points almost follow the same line.

**Graph 21. Phenomenological Model (2)**

Source: Author’s construction.
A modeller-statistician will use a linear equation with two parameters: "A" and "B".

**Graph 22. Phenomenological Model (3)**

Density = A + B x Time

\[ A = -20.2 \]
\[ B = 2.3 \]
\[ R^2 = 0.94 \]

This is what he obtains when he estimates these two parameters: "A" is at "-20.2" and "B" at "2.3". "R^2" is a statistic that takes on a value of between 0 and 1, it takes account of the proportion of variability in the data explained in the model – in this case, 94% of the variability of the data is explained by the model; the model functions and may be used for prediction.

One of the major disadvantages of statistical methods is that it is difficult to obtain a biological interpretation of the parameters of the model – in "B" we see growth in function of time, but we can question the significance of the value "A". We predict but we learn nothing about the mechanisms of what we observe.

How does a mathematician tackle the question?

**Box 3**

**Mechanistic Model**

Limited ressources:
- K would be the maximum density.
- The growth rate would decrease from r to 0 as the density increase from 0 to K

\[
\frac{dN}{dt} = \left(1 - \frac{N}{K}\right) r \times N
\]
The first observation is to say that finally resources are limited in the environment. This first term expresses the variation of population size. The growth rate “r” is maximal when "N=0” and minimal when "N=K". The mathematician makes hypotheses about the mechanisms then puts them in equation form; the third stage consists in solving the mathematical equation, which gives:

\[ N(t) = \frac{K}{1 + \left( \frac{K}{N(t_0)} - 1 \right) e^{-rt}} \]

The solution of the mathematical equation is called the prediction of the model. If we plot a curve that follows this equation, we obtain:

**Graph 23. Mechanistic Model (2)**

![Graph showing the mechanistic model with the equation \( N(t) = \frac{K}{1 + \left( \frac{K}{N(t_0)} - 1 \right) e^{-rt}} \).](source: Author’s construction)

The growth of the population follows an "S" shaped curve with a high growth rate at the beginning – almost equal to "r" – to then reach maximal growth "K". The model tells us for example that for the intermediate values of density, the relationship between density and time is almost linear.
Over the last twenty years in biology, a combination of the two approaches has been used. For our case study, it is necessary to use real data for the mathematical model. We have to find the values of the parameters of this model that will result in its being as close as possible to the data.

The big advantage of successfully combining the two approaches is thus to predict and produce knowledge about the mechanisms.

Remember that the two parameters “A” and “B” have no biological interpretation, whereas the three parameters of the mathematical model have a biological significance: “r” is the initial growth rate, “K” is the maximal size of the population and “N(0)" is the initial size of the population. The mathematical model allows an extrapolation. There are ultimately two types of prediction: interpolation and extrapolation. The first consists of predicting what happens between two points; extrapolation predicts what will happen outside the domain for which the data is available – which is more complex.
Let us now take a look at another fundamental notion in modelling related to the complexity of models.

Graph 25. Model Complexity

Let us imagine that you adopt a statistical approach to modelling this data (thirty points). You will opt for a linear model as before.

Graph 26. Model Complexity (2)

Source: Author’s construction.
The result is a line that globally cuts through the points but is not perfect. Let us then increase the number of parameters.

Here below is a three-parameter model; the curve accounts for the characteristic form of the data. Then with four parameters.

**Graph 27. Model Complexity (3)**

![Graph 27. Model Complexity (3)](source: Author's construction)

**Graph 28. Model Complexity (4)**

![Graph 28. Model Complexity (4)](source: Author's construction)
Using as many parameters as we have of data, we cut through all the data points: the matching between the model and the data is perfect; the advantage of increasing the number of parameters in a model is that the predictions are more accurate, the disadvantage is that we become less precise. This diagram illustrates the significance of the two concepts.

**Diagram 15. Model Complexity (5)**

![Diagram showing accuracy and precision](source: Author's construction)

Accuracy signifies that the model’s predictions – the stars – are, on average, close to the data that are at the centre of the target. In the column to the right, the models are not accurate: the average number of stars in both cases is far from the centre of the target. In statistics this is referred to as bias.

The other fundamental notion is precision. On the same line, the two models are precise and the precision details the dispersion of the model’s predictions. On the contrary, on the second line the two models are imprecise. The stars are dispersed. In statistics this is referred to as variance.

The problem lies in the fact that it is impossible to maximise accuracy and precision at the same time (see Diagram 16).

Accuracy increases – we cut through the same points – but to the detriment of precision that diminishes. You can seek the optimal number of parameters in your model by calculating bias and variance; you obtain the “Mean Square Error”. The optimal MSE plotting follows the intermediate values of parameters. Beneath this optimum, the models have insufficient parameters; above, they have too many.

Finally, the choice of approach in modelling really depends on your objectives. The best approach depends on the question asked.
Behind any attempt at modelling and even before the knowledge of any particular technique, there lies a question. Marc showed us two questions and possible combinations: prediction and the understanding of the phenomenon we wish to study. Benoît Gaudou will deal with a third category of question that concerns help in decision-making.

**Modelling in Epidemiology**

Marc Choisy

Let us examine a set of simple data gathered in 1979 in an English school that gives the daily count of children suffering from flu. The total number of children is 763. The plotting of the curve marks an increase then a decrease until the extinction of the epidemic (see Graph 29).

These models compartmentalise human populations according to their clinical state: susceptible, infected, recovered (“SIR”) – so-called compartmental models. Individuals move from one box to another: from susceptible to infectious, from infectious to recovered. The arrows show the flow of individuals from one box to another.

Let us begin with the last box that represents recovery. The parameter “y” illustrates the speed at which the process happens – the recovery rate. The higher the value of “y”, the shorter the period of infection, the lower the value of “y”, the longer the period of infection. The other parameter is the force of infection: it shows the speed at which a susceptible individual may become infected. This force of infection is more complicated than recovery as it depends on the number of infected people in the population; the proportionality constant “β” is a contact rate. Here, the speed at which
a susceptible individual becomes infected depends on the contact rate and the proportion of infected individuals in the population.

**Graph 29. A Simple Example**

Let us note two important notions in modelling vocabulary:
- One parameter is a quantity that is generally chosen by the user, it determines the behaviour of the system;
- A variable generally depends on the time and value of the parameters.

Typically, a variable is an output from the model whereas the parameters are fixed as inputs. We have here two parameters: "$\beta$" the contact rate; "$\gamma$" the recovery rate; three variables "$S$", "$I$" and "$R$" that represent the numbers of the susceptible, infected and recovered – a SIR model is a conceptual notion.

You may implement a SIR model in a stochastic, deterministic way with differential equations or with the help of agents, as we will see together this week (see Box 4).

We now have “SIR” models with three different types of implementation. In modelling it is important not to confuse the conceptual model and its implementation – for a conceptual model, different types of implementation are possible. The putting into practice of this conceptual model gives us two differential equations:
- The first describes the variation of the number of those susceptible;
- The second describes the variabilities of the number of those who are infectious.
The third is not differential. We need the two equations as the size of the school is fixed – 763 children. If we know “S” and “I”, we automatically deduce “R” as “N” is known.

Box 4

Differential Equations

\[
\frac{dS}{dt} = -\beta \times \frac{1}{N} \times S \\
\frac{dI}{dt} = \beta \times \frac{1}{N} \times S - \gamma \times I \\
N = S + I + R
\]

\[ R_0 = \frac{\beta}{\gamma} \]

\[ R = \frac{S}{N} R_0 \]

\[ p_c = 1 - \frac{1}{R_0} \]

Note: “\( \beta \)” contact rate; “\( \gamma \)” recovery rate.

S, I, R: Numbers of susceptible infected and recovered individuals (and immunised)

N: Total number of individuals – \( N = S + I + R \)

\( \Lambda \): Force of infection \( (i.e. \) probability of a susceptible individual being infected)

\( R_0 \): Basic reproduction number \( ( \text{average number of infections caused by an infected individual in an entirely susceptible population.} \)

\( p_c \): Minimal vaccination coverage to prevent an epidemic \( (i.e. \text{minimal proportion of the population to be vaccinated).} \)

Source: Author’s construction.

What do we learn from this?

The first result is “\( R_0 \)”, the universal statistic in epidemiology. “\( R_0 \)” is defined in a context where we introduce a single infected individual into a population that is only constituted of susceptible individuals: “\( R_0 \)” is the average number of individuals that the infected individual is going to infect – “Threshold Theorem”:

- If \( R \) is higher than 1, an infected individual introduced into the population infects on average more than one person – potential situation of epidemic;
- If \( R \) is lower than 1, we expect an infected individual introduced into a susceptible population to infect less than one person.

The expression “\( R_0 \)” is equal to \( \beta/\gamma \); or the contact rate over the recovery rate or again the contact rate multiplied by the average length of infection.

\( R_0 \) is in fact the initial value of a more general quantity “\( R \)”: “\( R \)” is simply equal to “\( R_0 \)” times the proportion of susceptible individuals. When this proportion of susceptible individuals is equal to “0”,
"R" is zero – end of the epidemic. By working with these mathematical equations, we can derive a lot of general and interesting properties.

Let us examine, for example, the last equation (bottom right). It is possible to demonstrate that the maximal vaccination coverage rate is equal to $1 - 1/R_0$. The higher the value of “$R_0$”, the greater the minimal vaccination coverage must be. If I were focusing on the flu, I would have an $R_0$ of about 4: in order to protect the whole population, it would be necessary to vaccinate at least 75% of the population. For measles – $R_0=15$ – minimal vaccination coverage will be 95%. What is interesting is that it is not necessary to vaccinate all individuals to protect the whole population: we speak about group immunity.

Let us summarise. We have just examined two uses of the model: deriving laws, general rules such as “$R_0$” – “Threshold Theorem”, group immunity; predicting – could we or could not be faced with an epidemic?

To go even further in predicting, it is necessary to calibrate the model, that is to say estimate the values of the parameters supported by the data. To do this, we are going to solve numerically the model of differential equations by randomly taking the values of parameters “$\beta$” and “$\gamma$”; the number predicted by the model will be then compared with the real data.

**Graph 30. Estimating Parameters**

![Graph showing the model with parameters $\beta$ and $\gamma$]

*Source: Author’s construction.*
If we take these values for the contact and recovery rates, we obtain this curve that represents the number of individuals in compartment "I". Qualitatively, an epidemic peak appears but, quantitatively, the matching between the model’s prediction and the data is not perfect. Estimating the parameters thus consists in looking for different value pairs between \(\beta\) and \(\gamma\) that improve the matching between the model’s prediction and the data.

**Graph 31. Estimating Parameters (2)**

Here are the optimal values found for \(\beta\) and \(\gamma\): \(R_0 = 3.69\), minimal vaccination coverage is 73%. Thus, by basing mechanistic theoretical models on real data, we can estimate the parameters and thus estimate the contact and recovery rates that are extremely difficult to measure in practice.
Let us plot the curve of infected, susceptible and recovered individuals, things that are difficult to measure as they are not easy to observe directly – we cannot visually distinguish between susceptible and recovered individuals. By counting the number of the ill, we thus succeed in estimating the contact rate and recovery rate, and in predicting the number of susceptible and recovered individuals at each moment.

2.2.3. Types of Questions about Modelling. Approaches and Models

[Alexis Drogoul]

What we understand by methodology is the way in which we find an answer to a question. What are the underlying stages? These stages require the use of tools and techniques. What is the correct order of the different stages to construct a model that answers this question? For the models that we are interested in – epidemiological models concerning mobility and control policies – we will use the whole of Benoît Gaudou’s presentation.
In addition to this presentation, we refer the reader to the 2014 workshop (Banos et al., 2014).

We are going to raise the following questions:

- What is the impact of economic trade and the control policies of countries on the propagation of the virus?
- How can we represent and simulate the propagation of dengue?
- How can we simulate economic trade in the corridor?
- What is the impact of control policies on this propagation?

We are going to have to identify the entities and the variables, which we can represent in the model. Several types of models may be used.

Marc Choisy presented equation-based models that allow us to observe a population or a phenomenon – reproduction of the evolution of the variables at a macroscopic level of the number of infected, healthy or susceptible individuals. We are going to focus more on agent-based models. We consider the model at a level of microscopic entities as, for example, the individuals in the epidemic model; our objective is to reproduce the dynamics between these individuals in order to observe concretely the evolution in the number of healthy, infected and recovered individuals.

**Graph 33. Link with Marc Choisy’s Presentation**

![Graph showing different types of models](Image)

*Source: Author’s construction.*
The models proposed beforehand are essentially descriptive, whereas agent-based models are situated at a generative level: reproducing a phenomenon from individual entities – the number of data used may be high, such as for the evolution of water flows in the Toulouse region, or even very abstract in order to represent a phenomenon such as segregation within a population.

The agent is defined as a player to which we can ascribe a type of behaviour – characterised by a state or a set of variables – in order to interact, communicate and perceive others and the outside environment. In the case of epidemiology: Is the agent healthy, infected or recovered? Beyond the static dimension of the model, we have to also define the different dynamics: the entities and their behaviour or even meteorological factors, temperature, etc.

**Map 16. Model: Entities, Dynamic and Scales**

- **Spatial scale**
  - Area that covers the ASEAN corridor from Myanmar to Việt Nam (1,300 km x 550 km; area=200,000 km²)

- **Time scale**
  - Duration: from 2004
  - Time step=12 hours

- **Dynamic to take into account**
  - Epidemic spread
  - Weather
  - Mobility
  - Control

- **Entities which may be taken into account**
  - Mosquitoes, humans
  - Meteo Station
  - Trucks, roads, cities
  - Country, policies

*Source: Author’s construction.*
To begin with, we must determine the system to be studied, limit it in space and time. The considered dynamics are those that will allow us to answer the initial questions:

- The dynamic of the “time” factor that has an essential impact on the epidemic;
- Exchanges between the countries along the corridor: mobility;
- The effect of State policies: control.

In order to represent these processes, we distinguish the entities at play: mosquitoes and humans; weather station data; road/lorry transport (mobility), control policies.

The methods of acquiring the data are explained; we refer the reader here to Marc Choisy’ plenary presentation. The technical aspects linked to data cleaning cannot be developed in the framework of this publication.

Once the data has been acquired, which agents should we integrate into the model?

<table>
<thead>
<tr>
<th>Question</th>
<th>Sub-model</th>
<th>Dynamics</th>
<th>Entities</th>
<th>Agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>How to simulate the spread of the dengue disease?</td>
<td>1. Epidemics</td>
<td>• Epidemic spread • Weather</td>
<td>• Mosquito • human</td>
<td>?</td>
</tr>
<tr>
<td>How to simulate economic exchanges between countries in the corridor?</td>
<td>2. Mobility</td>
<td>• Mobility</td>
<td>• Truck • Road • City</td>
<td>?</td>
</tr>
<tr>
<td>What is the impact of country policies on the disease spread?</td>
<td>3. Control</td>
<td>• Control</td>
<td>• Country • Policy</td>
<td>?</td>
</tr>
</tbody>
</table>

Source: Author’s construction.

Let us focus on the first model, knowing that no agent can be represented by either a human or a mosquito. We are going to simplify reality by considering portions of space.

Imagine that out of the whole of the JTD we only focused on one workshop and not on four: How would the state of the epidemic progress in a workshop with 30 healthy individuals and two infected ones, for example? The workshop would be an individual entity. Another workshop – another individual entity – would have the same data of healthy and infected individuals, etc. The dynamic of the model would be to see the exchanges between the four JTD workshops. To do this, the agents are given cells, squares of space.
The second type of agent represents meteorology: weather stations. The cells surrounding the weather point are influenced by the value of this point.

In process terms, the meteorological data are fed into the model in the form of time series data. For the cells, the propagation of the virus uses a classic model of the evolution of the number of the healthy and infected etc., and the interactions with the neighbouring cells in order to represent the propagation of the virus in space.

We are going to consider the lorries that circulate inside the corridor between the different cities. As far as control is concerned, we will naturally need the different policies applied by the different States.

<table>
<thead>
<tr>
<th>Sub-model</th>
<th>Dynamics</th>
<th>Entities</th>
<th>Data</th>
<th>Agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Epidemics</td>
<td>Epidemic spread&lt;br&gt;Weather</td>
<td>Mosquito&lt;br&gt;Human</td>
<td>Meteo_station.shp&lt;br&gt;Initialisation.csv</td>
<td>Epidemic_cells&lt;br&gt;MeteoStation</td>
</tr>
<tr>
<td>2. Mobility</td>
<td>Mobility</td>
<td>Truck&lt;br&gt;Road&lt;br&gt;City</td>
<td>Districts_v5.shp&lt;br&gt;Corridor_node.shp&lt;br&gt;Cities.shp&lt;br&gt;Provinces.shp&lt;br&gt;Countries.shp&lt;br&gt;Export.csv</td>
<td>City&lt;br&gt;District&lt;br&gt;Province&lt;br&gt;Country&lt;br&gt;Geographical_entity&lt;br&gt;Road</td>
</tr>
<tr>
<td>3. Control</td>
<td>Control</td>
<td>Country&lt;br&gt;Policy</td>
<td>Policy.csv&lt;br&gt;Control_policy.csv</td>
<td>Country_with_policy&lt;br&gt;Control_policy</td>
</tr>
</tbody>
</table>

Source: Author’s construction.

Finally, a few words about "Unified Modelling Language" that we are going to use in order to represent various forms of species[43] in the model and the links between them – see also on this subject the JTD workshop developed in 2013 (Drogoul et al., 2013).

[43] A species represents an archetype (class) of agents. By default, a species has a continuous topology.
UML, Agent Types, Attributes and Operations

UML is a graphical language allowing to specify, visualize, build and document elements of a system or a model. We focus only on class diagrams—the part of UML allowing us to represent the types of agents (species), their attributes and relations between these types.

Example from the epidemic model: for MeteoStation agents, with their set of attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>my_data</td>
<td>Matrix&lt; float&gt;</td>
</tr>
<tr>
<td>current_temp</td>
<td>float</td>
</tr>
<tr>
<td>current_hum</td>
<td>float</td>
</tr>
<tr>
<td>update_current()</td>
<td></td>
</tr>
</tbody>
</table>

Box 6

General Relations between Classes: Association

Line linking classes in relation.

Ends carry information about multiplicity (the minimum and maximum number of instances that can be involved in a relationship) and roles:

Example:

The different classes are going to have relationships with each other represented by lines. The number indicates how many entities are in relation with another entity – case of Việt Nam: a province is comprised of several districts but a district only belongs to one province, etc.

Benoît Gaudou concludes his presentation with questions concerning dynamics and model implementation. He presents three platforms: Net Logo, Repast Simphony and GAMA, which will be used for the training. Calibration objectives are also addressed.
Day 2, Tuesday 21st July

2.2.4. Question of Method. Building the Data Set

In the morning, Damien Philippon introduced some methodological aspects to build a data set. Three types of data were presented: raw data – epidemiological, demographic, climatic – derived data grouping together mobility and control policies. In the following session, Trương Chí Quang talked about the manipulation of geographical data: display and transformation via a geographical information system (GIS).

Three successive modelling axes were developed: epidemiological/dengue (Damien Philippon), mobility (Alexis Drogoul); public health policies (Benoît Gaudou). The construction details of each of these models cannot be included in the framework of this publication. In order to specify their content, we invite the reader to contact the trainers in this workshop and we also refer you to the different research programmes indicated in their respective biographies. By way of a methodological example, we have included below the session devoted to mobility in the space in question.

2.2.5. Modelling Mobility Along the East-West Corridor

[Alexis Drogoul]

We are going to study the impact of mobility and economic integration of ASEAN countries on the dengue epidemic along the Đà Nẵng-Mawlamyine corridor (see Map 17).

There is a correlation between, on the one hand, data linked to regional integration, tourism and trade between Asian countries, and, on the other hand, the number of recent cases of dengue. In order to explore the forms of relationship using these data, our methodological approach is based on the construction of two models: a mobility model and a model that combines mobility and dengue epidemiology (see Graph 34).
Map 17. East-West Corridor

Graph 34. Correlation between the Number of Dengue Cases and Exchanges between ASEAN Countries

Source: Author's construction (according to http://aseanup.com/benefits-asean-economic-community-aec/)
The first mobility model must allow us to express regional integration and its effects on the environment and social context. This simple model represents trade flows between ASEAN countries through the concrete trade of goods along the corridor.

**Graph 35. Mobility Model**

Hypothesis: the transportation of goods between countries by trucks along the corridors is an indicator of the dynamic of the trade exchanges between terrestrial ASEAN countries.

Source: Author's construction.

**Graph 36. Integrated Model**

Hypothesis: by making inter-country journeys, trucks are likely to transport infected mosquitoes or people from one place to another and then to spread dengue at long distance.

Source: Author’s construction.
The simplifying hypothesis (proxy) is that the transport of goods by lorry from one country to another can be an indicator of the economic dynamic between the countries; what is more, this transport has a concrete impact on the environment of humans and mosquitoes. A second hypothesis allows the construction of an integrated model; by travelling between different countries, the lorries have a non-zero probability – beginning their journey in infected places – of transporting infected mosquitoes or individuals over long distances (see Graph 36).

The reasoning is simple, and is applicable to all types of transport; the advantage of adopting such a modelling approach is that it allows a realistic exploration with the use of field studies.

How can we represent the concrete impact – number of lorries – of the growth of trade flows between ASEAN countries?

Our hypothesis is delimited by a reference in terms of spatial and temporal scale: four countries, about 1,500 km long and 400 km wide; a corridor; the model is considered from February 2004 with a time span of 12 hours for each simulation cycle. We will come back to this.

In terms of entities, we need at least to represent the countries, the districts or the provinces in function of the available statistics, of roads and of cities. The construction of the entities is carried out using GIS data.

Map 18. Mobility Model (2)
Table 20. Mobility Model: Trade Exchanges between Countries/Provinces

<table>
<thead>
<tr>
<th>GADM5_ID</th>
<th>ISO</th>
<th>NAME_ENGL</th>
<th>Shpex_Lng</th>
<th>Shpex_Area</th>
<th>COLOR</th>
<th>export</th>
</tr>
</thead>
<tbody>
<tr>
<td>126</td>
<td>LAO</td>
<td>Laos</td>
<td>47</td>
<td>19</td>
<td>yellow</td>
<td>155500</td>
</tr>
<tr>
<td>148</td>
<td>MMR</td>
<td>Myanmar</td>
<td>221</td>
<td>58</td>
<td>pink</td>
<td>299100</td>
</tr>
<tr>
<td>218</td>
<td>THA</td>
<td>Thailand</td>
<td>124</td>
<td>49</td>
<td>cyan</td>
<td>1866900</td>
</tr>
<tr>
<td>241</td>
<td>VNM</td>
<td>Vietnam</td>
<td>144</td>
<td>27</td>
<td>purple</td>
<td>908400</td>
</tr>
</tbody>
</table>

In addition to the ‘export’ value found in the shape file of countries (total number of trade export value x USD 1,000), one CSV file (export.csv) is used to represent the proportion of trade exchanges between the 4 countries considered.

The geographical data are supplied with a set of attributes. In order to represent trade exchanges between the different countries, we have:

- The export share in the country’s trade expressed in thousands of US Dollars;
- A file that represents the proportion of trade exchange between the four countries studied. If we take the case of Việt Nam: there is a 12% probability that these exports (by only taking into consideration the three other countries) will go to Laos, 86% to Thailand and 2% to Myanmar – see acquired synthetic data.

The agents in which we are interested must now be defined.

Diagram 17. Mobility Model: UML Structure of the Agents

Source: Author’s construction.
We obtain an abstract class of geographical entities characterised by a name and a population, three types of concrete agents that are the cities, the provinces and the districts. The relationships are then integrated: to a city a province, to a district a province, to a province a country, etc.; a country knows the probabilities of exporting to other countries, etc.

According to the classical administrative representation, entities in the form of agents identify roads and trucks – the trucks know which city they are coming from and their destination.

Once the breaking down into agents has been done, the latter become the support of the model’s dynamics; in the present case:

- The dynamic creation of trucks during the simulation. This is entrusted to the country agents. Every day, in an arbitrary manner, a country creates a group of trucks in a certain number of cities and sends them, according to export probabilities, to another city of the three other countries with which it has relations;

- The movement of trucks along the roads.

The complete model is written in three files that represent the different needs of modelling. The first file – “theoretic_mobility” – defines the species of agents described in the UML diagram. This is a static representation of the model’s data. The second file configures the agents from the species described in the first model and the available sets of data – shared_Mobility_Items. Finally, the last file authorises the switching on of the model through the production of indicators. This breakdown into files is important. We define the classes, the species, and the types of agent, that is to say the model’s structure.

We have just transcribed a part of the data into a particular mobility along a corridor between four countries and with truck agents created in function of the economic agents.

**Graph 37. Modeling Question**

*Source: Author’s construction.*
Let us now see the influence of road traffic on the dengue epidemic.

Diagram 18. Integrated Model: The Entities are those of the Two Previous Models

Source: Author’s construction.

We thus have an epidemiological dynamic and a mobility dynamic. We have to construct a coupled or integrated model. We will take the previously defined entities with attributes and types of behaviour that stem from each of the models.

We are going to work on the interaction between these two dynamics. How do we switch between these two models? The progressive coupling of the sub-models is an important technique insofar as extremely well conceived models exist in all domains. The objective is to reuse existing models while being careful to represent the forms of interaction.

The demonstration of the GAMA code illustrates the adaption of the two models to each other while notably giving a spatial dimension to the cells of the epidemiological model.
2.2.6. Scenarios and Indicators

[Nicolas Marilleau]

The central concept is the model, a manipulated object that opens the discussion.

Diagram 19. Give a Response to a Scientific Question

The model may be seen internally via the GAMA code and externally via the parameters and input and output data. Why is there this loop between the inputs and outputs? We continually go around the model; we conduct experiments and analyse their production.
The experimentation takes place throughout the process: some questions with Marc Choisy, an epidemiologist, at the end of the production. The models are conceived for concrete issues in the field. They have to reproduce real behaviour, hence the notion of calibration: we compare the developed model and the theoretical data with the field data.

The last main point is the notion of scenario. The model does not only produce real data but also generates knowledge – prospective data, dynamic phenomena. The experimentation thus opens up to different points of view: developer, experimenter, final user, thematician, etc.

Should we favour interaction or precision? In function of the time we have for experimentation, we are going to make the model more complex or, on the contrary, simplify it if we need interaction. Three classes of models may be identified:

- Simplified models used to understand phenomena, the dynamic. These models are used for development;
Final user-oriented experimentations. They allow us to determine scenarios and develop educational aspects — the user “plays” with the model, learns new things and determines which avenues to study.

Today, the projects are in either of these first two categories of models. We have reduced the spatial map to a single corridor:

- “Large-scale” models that allow the production of data that mirror reality. The constraint is calculation time and the high number of simulations.

The models may be divided into two classes: interactive models where we use the graphic interface to manipulate the model; “batch” type models where the only input is the configuration files – as output we obtain map-form data: “Scalable Vector Graphics” or “Shapefiles".
The GAMA platform offers two types of experimentations:

- “Graphic User Interface” (GUI) experimentations: the graphic interface is configured as requested in a simplified way; input and output are defined in the architecture;
- “Batch” experimentations: the simulations are automatically launched according to a method of experimentation; the user defines the parameters to be explored, a method of exploration and the safeguarding of data – the graphic interface no longer exists.

The end of the presentation provides more details about interactive visualisation to test the model and identify the scenarios in a participatory manner. The participants launch the experimentations on their own work station.

The day finishes with a presentation of the projects. Five modelling topics are proposed:

1. Mobility and opening up of the corridor. Study of the impact of the change in state of the roads and the progressive opening up of the corridor on the propagation of dengue.

2. Participatory model. Creating a role-play that allows the players to control a country along the East-West corridor and make decisions about development and the propagation of a dengue epidemic. Cooperation rules – that may or may not be respected – are established between several countries in order to manage the propagation.

3. Country policy and decision-making. The objective is to identify the most interesting strategy to adopt to manage the propagation of dengue along the corridor.

4. Pooling of ASEAN budgets within an international organisation. The objective is to conceive and model such an organisation, its behaviour and mechanisms of redistribution to the most affected countries and provinces.

5. Climate change. By modelling floods and its consequences on the life cycle of mosquitoes, the project must allow us to understand the impacts of climate change on dengue epidemics.

Day 4 is devoted to group work with the help of the trainers. Each topic is presented to the workshop; a methodological reflection begins that specifies the principal challenges and difficulties of modelling. The last day wraps up the workshop’s practical dimension. The final work presentations are submitted and debated. Three volunteers among the trainees also prepare a summary of the five topics dealt with, for the following day’s return in the plenary session.
Selected bibliography


## List of trainees

<table>
<thead>
<tr>
<th>Name and Surname</th>
<th>Establishment</th>
<th>Domain/discipline</th>
<th>Research topic</th>
<th>Email</th>
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<tbody>
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</tbody>
</table>
2.3. Development Corridors in ASEAN

Ruth Banomyong – University of Thammassat, Nathalie Fau – University of Paris 7, Elsa Lafaye de Micheaux – University of Rennes 2, Hugues Tertrais – University of Paris 1

(Transcript)

Day 1, Monday 20th July

Presentation of trainers and trainees (see list of trainees at the end of chapter and biographies of trainers)

[Nathalie Fau]

We are going to take a look at economic corridors using various disciplinary approaches; geography, logistics, history and economics.

This first day will be devoted to the discovery of the concept of the economic corridor, then we will reflect on the types of questions that might be raised about this scientific topic. This will allow us to introduce the different disciplinary approaches that we will be using this week. We are going to begin with some group work in order to establish an analytical framework. Our objective, for the end of the day, is to compare the frameworks developed in the workshop with those developed during the research programme presented in the plenary session.

Tomorrow, the logistical approach to the corridors will be presented by Ruth Banomyang, a logistics specialist who collaborates closely with the Asian Development Bank (ADB). Ruth has notably implemented a protocol to assess the performance of corridors. On Wednesday, Hugues Tertrais will examine the historical definition of the concept of corridors; Thursday will be devoted to an economic analysis of the corridors and how they form part of a general reflection on development by Elsa Lafaye de Micheaux. As for me, on Friday I shall present a geographical approach to these corridors while attempting in particular to identify their spatial impact on cities.
2.3.1. Contextualisation and Presentation of the Different Corridors in the GMS

The GMS was established in 1992 by the ADB. However, the Mekong River is not a structuring element in the region, it is more a symbol of reunification and reconciliation between the different countries.

Before the creation of the GMS, cooperation was organised by the Mekong Committee whose activities focused on its water management. The Committee wished to establish a supranational institution, which in reality is one of the reasons for its failure.

The objective is to encourage transnational integration, to draw upon the differences in economic development in order to encourage growth throughout the Southeast Asian region.

There is a large diversity in development between the countries of the GMS. The idea is to use this disparity as a basis to encourage development (see Map 19 & Table 21).

In 2005, the GMS had 312 million inhabitants. Nearly one third of these are from China. Việt Nam represents nearly 27% of the total population compared to only 1.7% for Laos. These demographic characteristics are essential to understand the dynamics at work in the region, particularly in terms of migration.

There are also big differences in GDP. 55% of the region’s wealth comes from Thailand, whereas Myanmar represents only 1% of the total GDP. These figures allow us to grasp the mechanisms of industrial delocalisation. Let us also take note that the average per capita revenue in Thailand is 2,523 dollars compared to only 107 dollars in Myanmar.

Growth rhythms are also different. While growth in Yunnan and in Guangxi is 11.4%, it is only 2.9% in Myanmar. Thailand attracts the most foreign investment followed by Việt Nam. Conversely, Laos attracts very few foreign investors. It is also interesting to compare the economic dependence of these countries on the GMS. Laos is the most dependant – 75% of its trade flows come from within the GMS – conversely, GMS internal trade only represents 2% for China, which shows that this factor was not decisive in the creation of the GMS.

Two generations of corridors must be distinguished, between 1999 and 2002, then from 2002 to today (see Map 10).

The most structuring axis is the North-South corridor that links Kunming (Yunnan) to Bangkok in Thailand. This corridor is complete from an infrastructural point of view; its opening has allowed Kunming to experience new dynamism – because of its outlying location the city had been neglected by the Chinese State during the Cold war. The road axis is complemented by a navigable water axis that is open for ships of up to 150 tonnes.

The second axis is the East-West one. It links Đà Nẵng in Central Việt Nam to Moulmein in Myanmar; it has a particularity of not crossing through any big city in the region. This was a deliberate choice by the ADB in order to allow the expansion of medium-sized cities.
Map 19. Greater Mekong Subregion

Source: http://www.gms-eoc.org/
Table 21. Indicators Presenting the Power Relations between GMS Countries

<table>
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<tr>
<th>Country or Chinese Province</th>
<th>Cambodia</th>
<th>Yunnan et Guangxi</th>
<th>Lao PDR</th>
<th>Myanmar</th>
<th>Thailand</th>
<th>Việt Nam</th>
<th>GMS Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Surface Area (1,000 km²)</td>
<td>181.0</td>
<td>630.7</td>
<td>236.8</td>
<td>678.5</td>
<td>514.0</td>
<td>3290</td>
<td>12.8</td>
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<tr>
<td>Including Mekong basin</td>
<td>153.6</td>
<td>1698</td>
<td>202.1</td>
<td>32.3</td>
<td>186.0</td>
<td>647</td>
<td>8.0</td>
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<tr>
<td>Including Yunnan</td>
<td>3955</td>
<td>15.3</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Including Guangxi</td>
<td>2352</td>
<td>9.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Population (millions)</td>
<td>14.1</td>
<td>2.3</td>
<td>5.9</td>
<td>50.6</td>
<td>66.5</td>
<td>838</td>
<td>26.7</td>
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<td>GDP (millions of dollars)</td>
<td>5400.0</td>
<td>75,360.0</td>
<td>3,200.0</td>
<td>8,700.0</td>
<td>180,600.0</td>
<td>52,100.0</td>
<td>325,360.0</td>
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<td>Per capita income (dollars)</td>
<td>371.0</td>
<td>702</td>
<td>456.0</td>
<td>107.0</td>
<td>2,5230</td>
<td>5680</td>
<td>795</td>
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<tr>
<td>Growth Rate</td>
<td>6.0</td>
<td>11.4</td>
<td>7.0</td>
<td>4.5</td>
<td></td>
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<td>FDI (millions of dollars)</td>
<td>131.0</td>
<td>436</td>
<td>17.0</td>
<td>556.0</td>
<td>3,4370</td>
<td>24000</td>
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<td>Tourists (millions)</td>
<td>1.421</td>
<td>2.231</td>
<td>1.095</td>
<td>0.660</td>
<td>11.500</td>
<td>3.468</td>
<td>20.376</td>
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<tr>
<td>Export + import (millions of dollars)</td>
<td>6406.0</td>
<td>7,9780</td>
<td>1268.0</td>
<td>5,4280</td>
<td>215,169</td>
<td>66,742.0</td>
<td>302,990.0</td>
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| Intra GMS Trade (millions of dollars)* |
|-----------------------------|----------|---------|---------|---------|---------|
| 1992                        | 20.1     | 1.2     | 63.3    | 23.4    | 2.8     |
| 1997                        | 40.0     | 1.8     | 66.8    | 17.5    | 4.6     |
| 2002                        | 24.5     | 1.9     | 67.8    | 35.6    | 8.9     |

* Percentage of intraregional trade (GMS) in the total trade of these countries.

Development Corridors in ASEAN

Map 20. Geopolitical Approach: Improving Connectivity with Neighbouring non-ASEAN Countries

Note: the circles indicate the cities along the corridors; their size is proportional to their demographic weight.

MIETC: Mekong India Economic Corridor Initiative
EWEC: East West Economic Corridor
Kaladan MMTT: Kaladan Multi-Modal Transit Transport
DMIC: Delhi Mumbai Industrial Corridor (DMIC)


The South-East corridor forms an axis between Bangkok, Phnom Penh and Hồ Chí Minh City. The objective is to link cities that are already part of the process of globalisation to emerging ones. Finally, the fourth big corridor of the region links Kunming to Hà Nội (North-East corridor). This one has not yet been completed from an infrastructural point of view. The objective is to link these two economic poles.

The initial idea of the ADB was to launch simultaneously several corridors in order to avoid creating an imbalance between the different economic zones concerned and to recreate a network for the whole of the peninsula. From 2002, the ADB created new corridors, notably the Kunming-Yangon one. However, the biggest change is the integration of Guangxi province into the GMS. This has
resulted in the emergence of corridors from Nanning (the capital of the province). The first of these runs along the coast between Nanning, Hải Phòng, Đà Nẵng and Hồ Chí Minh City; the second links Nanning to Bangkok via Vientiane. Other minor corridors were also created – running parallel to the already existing ones – but without really changing the peninsula’s structure.

At the centre of all these corridors is Bangkok. Today, the city is the leading logistical pole in the region. The second winning city is Kunming. These two cities are the “network leaders” because of the number of corridors that cross through them.

One of the ADB’s important decisions was to extend these transport networks outside the GMS, notably towards China and India (see Map 12). This should have a considerable impact on the GMS Kunming-Beijing-Shanghai axis.

The Mekong-India economic corridor is one of the ADB’s principal projects (see Map 20). The objective is to link Chennai to Bangkok via Myanmar in order to link two of the region’s major industrial poles. This entails an extension of the East-West axis but also of the Hồ Chí Minh City, Phnom Penh, Bangkok one.

Nguyễn Quốc Định

These statistics are from 2005. Have there been any changes since then concerning inequalities in the region?

[Nathalie Fau]

This date has been deliberately chosen because it illustrates the economic reality of the region at the moment of the creation of the corridors. On Thursday, we will work on updating the data.

Khin Hnит Thit О О

Have the roads within the corridors all been completed?

[Nathalie Fau]

There are a lot of projects in progress, the whole lot is not completed. We consider that a road has been completed when there is a minimum of a two-way road.

Đỗ Lý Hoài Tân

Are air routes also taken into account when characterising these corridors?

[Nathalie Fau]

Up until 2002, we only spoke about the construction of road axes. After 2002, we also took into account legislative changes that made circulation or even the air connections easier between the poles. The current conception of the corridors is a lot broader than it was in 2002.
Nguyễn Thị Thanh Xuyên

China has been playing an active role in the GMS since 2002. Have there been any changes in terms of competition between China and the other countries of the GMS?

[Nathalie Fau]

There is strong competition within China, notably in Kunming and Nanning, which both seek to establish themselves in the GMS. The weight of China is felt a lot more outside its borders. The roads have been completed and more and more Chinese traders and farmers are present in northern Laos.

Khin Hnit Thit O O

Have the new networks resulted in the implementation of new development projects?

[Nathalie Fau]

The presence of infrastructures does not necessarily lead to the promotion of economic development. Đà Nẵng, for example, has had difficulty asserting itself for a long time now because of the bipolarisation between Hà Nội and Hồ Chí Minh City. Finding itself the gateway of the East-West corridor has allowed it to change dimension and obtain an international influence that was impossible in the past. The problem it currently faces is the use of these investments by the private sector.

Nguyễn Quốc Định

Are river axes taken into account when characterising these corridors?

[Nathalie Fau]

As for maritime transport, cost is only reduced if we can transport large quantities. This is not always the case for river axes as the ships can rarely go beyond 150 tonnes. Certain segments are however of utmost importance – the case of the waterway between Yunnan and Luang Prabang that has completely modified trade.

Đỗ Lý Hoài Tân

Is there a supranational legislation governing these corridors?

[Nathalie Fau]

Absolutely not. Just like in the whole of ASEAN, each Member State wishes to conserve full sovereignty over its territory. On the other hand, there are bilateral agreements that make circulation and border crossing easier.
The trainees are divided into four distinct groups: two groups study a text devoted to the GMS corridors, the two others work respectively on a text devoted to corridors in Africa and Latin America. The objective is to familiarise the trainees with the principal notions and determine whether the objectives and issues attached to the corridors are the same in other regions of the world.

Questionnaires related to the texts transmitted before the workshop are given to the trainees; feedback will be given through the trainee’s questions in order to compare their answers in function of the geographical areas (see reading material: Taillard, 2014; Mulengal, 2013; Bender, 1998).

- What are the definitions of the term “corridor”?
- What are the differentiating elements of the segments of a corridor?
- What were the modes of spatial organisation before the implementation of corridors?
- In what context were the corridors implemented? Why?
- Which level of decision-making dominates in the dynamism of the corridor? Local, national or transnational?
- Which players dominate in the implementation of the corridors?
- What are the expected spillover effects of corridors on economic activities?
- Which spaces need to be studied in order to analyse the effect of the corridors?

Trần Thị Lê Dung

According to the African definition, the corridor is a route that links different places in order to facilitate the transport of merchandise, services and development.

Khamhoung Alounna

In the Asian definition, the corridor is a transnational strategy aiming to link the principal axes, particularly at the industrial production activity level. These corridors are achieved by the implementation of physical, logistical and political infrastructures.

Nguyễn Thị Thanh Xuyên

In South America, the corridor has two main characteristics: the production of basic necessities and services; the creation of transport in order to create the added value of these products.

[Nathalie Fau]

The first common point between these definitions is the notion of the transport axis. A corridor must also be transnational and play an active role in the economic development of the regions it crosses through. The corridor also identifies a political and institutional change. This is the distinction made by Ruth Banomyong between Soft Infrastructure and Hard Infrastructure. The definitions of the GMS and Africa are very similar because both are inspired by the United Nations (UN). One
comes from the ADB and the other from the African Development Bank. Latin America is different because it wants to remain independent from the big institutions. The idea is to link production and consumption zones. Furthermore, South American corridors must promote the emergence of new cities instead of linking existing big cities.

**[Ruth Banomyong]**
Domestic corridors also exist; these have notably been developed in Malaysia and Indonesia.

**[Nathalie Fau]**
What is interesting is the comparison between the logics of national and transnational corridors. We will take a look at this later.

What were the modes of spatial organisation before the implementation of corridors? In South America, the geographical unit was traditionally around water basins, which went beyond the national scale; just like the geographical unit which was organised around the Mekong in Southeast Asia.

**Nguyễn Quốc Định**
In Asia, before the GMS, there was the Greater Mekong Committee. Its objective was to manage the use of water resources. However, this Committee had little structure, this was why the GMS was created.

**[Nathalie Fau]**
There also used to be the growth triangle that we mentioned in the plenary sessions. In 1950, could we have envisaged implementing corridors in Asia?

**Đỗ Lý Hoài Tân**
Before the creation of corridors, Asian States were divided at a political and economic level. At the end of the Cold War, geopolitical transformations took place – the transition of a centralised economy to a market one.

**[Nathalie Fau]**
What about Africa? The context was similar to that of Asia. Countries turned their backs on one another and it was the geopolitical changes, the evolution in relationships between the States that allowed the creation of corridors. We cannot imagine one without the other.

Which decision-making level dominates the dynamics of a corridor?

**Phạm Thị Mỹ Trinh**
In Africa, they start at a local level and then progress to a transnational one. Private, public and civil organisations become involved.
Shared Challenges for Development within ASEAN

[Nathalie Fau]
We must also emphasise the important role of the African Development Bank. In Africa they are also concerned about getting the local population directly involved in development policies. Finally, the African corridors are the result of bilateral agreements between States.

Trương Mỹ Diễm
In Asia, priority was given to the local level. With the passage of time, the extension of these corridors allowed other countries to become involved. Furthermore, the ADB has a particularly important role.

Khamhoung Alounna
ASEAN also plays an important role through its annual summits.

[Nathalie Fau]
Both in Asia and Africa, a supranational body plays a leading role.

[Ruth Banomyong]
I am currently finishing a report for the Asia-Pacific Economic Cooperation (APEC) about “Public-Private Partnerships” (PPP). We cannot always ask public bodies to finance all the infrastructures of a corridor. The private sector has a role to play in these areas. PPPs are in fashion, but there is no common definition. The implementation methods of these partnerships are complex and this creates some confusion. Provincial PPPs are another challenge, particularly in Việt Nam. Today, every province wants its own logistics park – warehouses, light industry factories, packaging factories, etc. It is the same case for the Thai ports. But we must absolutely understand the country in its totality in order to avoid unused infrastructures (“white elephants”).

[Nathalie Fau]
In Latin America, there is a refusal to use institutions such as the ADB; there is a wish to promote local needs and local decision-making. The institutional role of the States is also clearly weaker than in Asia. The implementation of corridors has, for example, been associated with the extensive implementation of decentralisation processes.

Finally, what are the expected spillover effects of the corridors on economic activities? These corridors must encourage the integration of markets and increase commercial trade at a regional level, open up countries, fight against poverty and create jobs.

The last question consisted of asking which spaces it is best to study in order to analyse most efficiently the effect of the corridors. The answer was not in the texts.

Let us consider the East-West corridor linking Moulmein to Đà Nẵng. It is the border areas that reveal best the effects of the corridor. Furthermore, we may often remark that the development of cities located at borders is very different from that of other cities. The port areas at the ends of these corridors are also interesting areas to study. If the corridors work well, we should be able to observe
a strong dynamic in the ports. It is important to identify the place, the precise zone that we wish to examine in order to be able to study the corridor efficiently.

At the end of the day, Nathalie Fau presents and comments the analytical framework developed within the framework of the Transiter programme.

Day 2, Tuesday 21st July

2.3.2. The Logistical Approach to Corridors

[Ruth Banomyong]

We are going to examine the methods to measure the performance of a corridor, including the logistics aspect. Then, we shall examine the typology of corridors proposed and adopted by the ADB. I shall also present to you a corridor assessment method I developed during my doctoral thesis. We shall look at an application of this model on the North-South corridor linking Kunming to Bangkok. There is a bifurcation in this corridor – the Kunming- Hà Nội- Hải Phòng sub-corridor – I collected data for the ADB when they wanted to improve the development of the corridor. We shall finish with some group work this afternoon.

But first of all, how would you define logistics?

Sang Borana

Logistics is a set of basic infrastructures used to measure the performance of a corridor.

Khamhoung Alounna

It’s a group of procedures used to plan, develop and efficiently control the relationship between producers and consumers.

[Ruth Banomyong]

This vision of logistics as a process is similar to the English definition. Two distinct levels must be taken into account: enterprise logistics – what must the company do in order to meet customers’ distribution needs, at both the information and merchandise level? Logistics thus integrates enterprise competitiveness at the national and transnational level. Logistics at the macro level presents four dimensions:

- Infrastructure, which is the basic condition;
- Institutions, that is to say the laws and regulations that facilitate or prevent the movement of goods, vehicles and people;
Service providers who offer a logistics service according to the existing infrastructure and regulations;

Producers and traders who need to have access to competitive logistics services in order to be competitive themselves.

The role of logistics is essential because it can/must facilitate regional integration. Furthermore, the cost of logistics may remain high: the transport cost of a container from Rotterdam to Singapore is less expensive than the transport of a container from Vientiane to Pakse in Laos! Why is this the case? There is not enough volume for an economy of scale.

Map 21. Greater Mekong Subregion. Economic Corridors

Source: Author’s construction.
Facilitation is one of the key words when we examine corridors. We facilitate flows, the movement of people, merchandise and information. We need to develop the logistics of the players in a country so that the country itself may become competitive. In 2013, in Bali (Indonesia) the WTO signed an important agreement regarding trade facilitation: this agreement is based on logistics (see Map 21).

On this map we have three principal corridors: the South-South corridor – Bangkok, Phnom Penh, Hồ Chí Minh City and Vũng Tàu; the East-West corridor – that links Moulmein in Myanmar to Đà Nẵng in Việt Nam; the North-South corridor – that links Kunming in China to Bangkok. I worked on these corridors for three years in the field and I can affirm that the infrastructures have greatly improved over the last few years.

What names does the ADB give to these corridors? The South-South one is called “Road n°1”, the East-West one “Road n°2” – or “Road n°9” because it is the name of the road in Laos that constitutes the national Laotian part – and the North-South "Road n°3" – there is now an extension of this corridor from Bangkok to Dawei in Myanmar. The ADB did not want this extension but the members of the GMS decided otherwise, especially the private sector in these countries.

All these corridors are interface points with other modes of transport and other markets. Let us take note of the hierarchy of ports in Asia.
We can principally distinguish the “mega-ports” with a global reach such as Hong Kong, Singapore or Kaoshiung from the regional traffic ports.

The idea of economic corridors exists for the sub-regions in general. We can, for example, take a look at the IMT-GT growth triangle (Indonesia, Malaysia, Thailand).

We observe three principal maritime liaisons: the first passes through the Malacca Strait; the second links Penang to Medan; the third links Malacca to Dumai. One of the specificities of the IMT-GT is the existence of a domestic corridor between Banda Aceh and Palembang. When I worked on this growth triangle, there was talk about a project for a corridor between Phuket and Banda Aceh, but in reality there are no flows between these points. Does the development of an economic corridor come from the demand or the supply side?

[**Elsa Lafaye de Micheaux**]

I think the central issue is the role of the State as an economic planner.
[Ruth Banomyong]
The corridor is a development tool that greatly depends on a government’s development policy. We discover, however, in the field, that many corridors were developed from old corridors that existed above all for smuggling.

[Nathalie Fau]
What is the place of Singapore? Why hasn’t Singapore been integrated into these IMT-GT corridors?

[Ruth Banomyong]
Singapore is far more advanced than its neighbours economically and its relations with the three other countries might be a problem. It was to avoid being dominated by the central role of Singapore that they avoided including it in the triangle. We speak a lot about the “ASEAN” spirit, but there are divergences in points of view and a great competitiveness between the countries. Let us take two examples:

- I have just been working on an agreement for the transport of passengers by bus in ASEAN financed by the European Union. The Philippines are blocking the negotiations because the buses supplied are not adapted to driving on the left-hand side of the road, as should be the case in the Philippines. However, we may ask why the Philippines is involved given that their country is composed of 7,000 islands and certainly not adapted to this type of agreement;

- Singapore does not want to sign an agreement for the cross border transport of passengers because the country does not have a railway system. The station belongs to KTM Berhat, the Malaysian railway company. During these discussions, the ASEAN Secretariat cited the example of Laos that signed the maritime agreements even though the country is completely landlocked. The dynamics of negotiations is also interesting from this point of view.

Ruth Banomyong gives the trainees ten minutes to prepare a definition of economic corridors in working groups.

Trương Mỹ Diễm

They are defined as economic spaces used to link together different territories and States in order to facilitate the development of infrastructures, the flow of goods as well as the elaboration of a policy that facilitates the development of the territories in question.

[Ruth Banomyong]
Your definition focuses on the development support provided by the corridors.
Khamhoung Alounna
The economic corridor is a space common to several countries within the same region in order to aggregate planning, development and the control of the territory.

Nguyễn Thị Thanh Xuyên
Our definition is based on the spirit of structure and function. The corridor is a trans-regional and transnational transport axis that links different economic spaces. The objectives to be attained through the corridors are economic development and also the development of production, but also the improvement of infrastructures and legislation.

[Ruth Banomyong]

<table>
<thead>
<tr>
<th>Stage</th>
<th>Corridor</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1</td>
<td>Transport Corridor</td>
<td>Corridor that physically links an area or region</td>
</tr>
<tr>
<td>Level 2</td>
<td>Multimodal Transport Corridor</td>
<td>Corridor that physically links an area or region through the integration of various modes of transport.</td>
</tr>
<tr>
<td>Level 3</td>
<td>Logistics Corridor</td>
<td>Corridor that not only physically links an area or a region but also harmonises the corridor’s institutional framework to facilitate the efficient movement and storage of freight, people and related information.</td>
</tr>
<tr>
<td>Level 4</td>
<td>Economic Corridor</td>
<td>Corridor that is able to attract investment and generate economic activities along the less developed area or region. Physical linkages and logistics facilitation must be in place in the corridor as a prerequisite.</td>
</tr>
</tbody>
</table>

Source: Author’s construction.

We can distinguish four levels of corridor:
- Level 1 identifies a transport corridor. This is a corridor where there is only a simple physical connection (road);
- Level 2 is the multimodal corridor. We use several modes of transport: road and train, or road and barges – old example of the Bangkok-Phnom Penh-Hồ Chí Minh City corridor. In these multimodal corridors, competition may exist between the different modes of transport. It is the case of door-to-door transport with at least two different modes of transport. In practice, this is very often the case: in the case of rail transport, a lorry is generally needed to arrive at the station and a second one when the train arrives.

These two levels are essentially based on the infrastructure itself.
- Level 3 corresponds to what I call a “logistics corridor”. Physical connectivity is necessary (thus a level 1 or 2), but also a legislative framework that facilitates movement and storage in this space. In certain cases, the infrastructure arrives first and then the legislative framework follows.
Consequently, we cannot yet use the infrastructure – example of the bridge financed by Japan and built over the Mekong between Mukdahan in Thailand and Sannavakhet in Laos. When the work was completed the bridge remained unusable because the two countries had not yet reached an agreement about its conditions of use. A logistic corridor is not only the facilitation of trade and service flows, people too must be able to pass;

- The last level is the economic corridor. The prerequisite is to have attained the third level. The economic corridor must be capable of attracting investment and generating its own economic activities. Interconnected industrial zones then appear as points along the corridor.

Let us now address the question of statistics in the region. Government figures are often dubious and we may ask which figures we should choose. There are only few specific statistics about corridors, as they are established more at the national level. These are often commercial statistics that above all give a value. For my part, I am interested in volumes because they allow infrastructure planning.

Let us examine the characteristics of the North-South corridor. We are going to talk about the working method; the first thing is to assess the basic infrastructures. The assessment may be done on a quantitative basis using performance indicators, but the lack of statistics poses a problem.

### Table 23. NSEC/GMS Logistics Characteristics

<table>
<thead>
<tr>
<th></th>
<th>Road</th>
<th>Port</th>
<th>IWT</th>
<th>Airport</th>
<th>Railway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guangxi (PRC)</td>
<td>Fair/Good</td>
<td>Fair</td>
<td>Fair</td>
<td>Good/Fair</td>
<td>Good/Fair</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>Fair/Poor</td>
<td>Poor</td>
<td>Fair/Poor</td>
<td>Poor</td>
<td>N/A</td>
</tr>
<tr>
<td>Myanmar</td>
<td>Poor</td>
<td>Poor</td>
<td>Fair</td>
<td>Poor</td>
<td>Fair</td>
</tr>
<tr>
<td>Thailand</td>
<td>Good</td>
<td>Fair</td>
<td>Fair</td>
<td>Good/Fair</td>
<td>Fair</td>
</tr>
<tr>
<td>Việt Nam</td>
<td>Fair/Poor</td>
<td>Fair</td>
<td>Fair</td>
<td>Fair</td>
<td>Fair</td>
</tr>
<tr>
<td>Yunnan (PRC)</td>
<td>Fair/Good</td>
<td>Fair</td>
<td>Fair</td>
<td>Good/Fair</td>
<td>Good/Fair</td>
</tr>
</tbody>
</table>

NSEC: North South Economic Corridor.

*Source: Compiled from industry.*

There is also a qualitative method: we ask those who offer their services along the corridor to share their impressions concerning the quality of the infrastructures. The infrastructure changes and the users’ answers may evolve in function of these changes. It is not a very precise tool but it allows us to nonetheless assess connectivity.

Let us take the case of the East-West corridor. What is the level of the road infrastructure? The total level of the corridor will be that of its lowest quality segment. Even if the road is good in Thailand, the fact that it is of poor quality in Laos results in the overall quality of the corridor being poor.
We can use several assessment methods. The “Logistic Scorecard” method is mainly interested in four dimensions: infrastructures, institutional framework, service providers and operators. Within each dimension several indicators may reflect performance.

I developed a questionnaire for service providers, as there was no database to utilise. On the other hand, I was able to find information concerning the institutional framework and the importers and exporters on the World Bank’s database – www.doingbusiness.org. We find, for example, data about the time necessary for the preparation of documents before importing or the names of documents to prepare. It is an interesting tool to use when first approaching a country because it gives us an idea about the documents, cost and the time necessary to import/export. There is nevertheless a problem: there is no information about data gathering methods. In reality, the World Bank hires local consultants and often the figures given are bad in order to bring to the attention of governments the necessity to reform.
Here is the two-dimension “Banomyong Model” I developed during my doctoral thesis.

**Graph 38. The “Banomyong” Multimodal Transport Cost Model**

The vertical axis may measure time or cost, the horizontal axis measures distance. The theoretical base stems from a basic model from the domain of transport economics that is linked to the cost-distance comparison of roads and railways. Often, road transport is less expensive over short distances. There is a point of intersection after which rail becomes more competitive – between 600 and 700 km. This framework is purely theoretical because of door-to-door transport that combines different modes of transport (see Graph 39).

The initial journey is generally done by lorry, the longer the distance, the higher the cost. At the border, time lost is represented by the length of the vertical line. The same scenario is repeated with the rail transport before arriving at the destination and the departure of the ship. The model throws light upon what happens in the corridor in terms of cost and time (see Graph 40).
**Shared Challenges for Development within ASEAN**

**Graph 39. Model (1)**

![Graph 39. Model (1)](image)

*Source: Author's construction.*

**Graph 40. Model (2)**

![Graph 40. Model (2)](image)

*Source: Author's construction.*
This method also allows us to throw light upon the bottlenecks present in the corridor, the places where the merchandise does not move – transhipment, border crossings. It gives us a reference point regarding performance. The challenge is then to ask how we can reduce the vertical lines. We can thus look again at the performances of the corridor at different periods in order to verify whether the transport facilitation policies are being well implemented.

One of the advantages of using this model is to make the results accessible to everyone. It allows politicians to assess and improve the performance of the corridors, particularly at the transnational level.

Let us take the example of the railway linking Tianjin (China) and Ulaanbaatar (Mongolia). According to a bilateral agreement concluded with China, the port of entry to Mongolia is the port of Tianjin. The agreement is planned for rail transport – the road cannot be used in winter because of ice.
Graph 42. The Model: Tianjin-Ulaanbaatar Railway Link

We can observe that the speed of the trains is particularly low – three days are necessary to cover 1,700 km. The bottleneck takes place at the border. What is the problem? Firstly, the standard rail gauge is wider in Mongolia than in China: it is necessary to remove the containers and change the chassis. This operational part lasts a minimum of six hours. In order to pass through customs, there are three more hours on the Chinese side and five hours on the Mongolian side.

The study of a corridor is done in several stages. It is first necessary to be familiar with the route and then determine the modes of transport that may provide the service. It is necessary to calculate the distance between points, by section, verify how long and how much for each section. The line of route is easily calculated, the difficulty is to assess the time and cost inputs.

Interviews with service providers are necessary. The problem is that they will often only give the total cost and length of the journey: sections are absent in the analysis. It is thus necessary to broaden the circle of the people to be contacted and ask some people questions concerning sections and others questions about the whole corridor. The method is easy to grasp but it is more difficult to obtain the connection network in order to obtain the data. Corridor performance studies allow us, concerning price for example, to compare several borders.
Let us recapitulate.

**Graph 43. Corridor “Snapshot” Assessment Model**

From the origin to the destination, the challenge is to reduce the vertical lines.

Ruth Banomyong projects a video of the North-South Kunming-Bangkok corridor (see Closing the Gap. Overland from Kunming to Bangkok via Route 3 – included in the CD-ROM linked to this publication).

Let us examine the situation of the corridor in 2006 (see Graph 44).

When passing through Chiang Rai, the first choice must be made: via Laos, via Myanmar or via the Mekong River. If we observe the route that crosses through Myanmar, the border crossing is expensive: the merchandise is in transit, it is destined for Chinese consumers. Furthermore, the border crossing between Myanmar and China is also expensive. We can note that transport costs per kilometre are lower in Thailand than in Myanmar; on the other hand, the cost in Thailand and China is almost identical.

In the case studied, the transported merchandise was rubber. Through Myanmar, the cost was 470 dollars per tonne; through Laos, 382 dollars per tonne – the cost of crossing the border between Thailand and Laos is the lowest. But the least costly option is the one that combines road and river: approximately 270 dollars per tonne. This combined journey takes longer because the ships sail against the current (see Graph 45).
Graph 44. Logistics Corridor Modelling: Cost (2006)

Source: Author’s construction.

Graph 45. Logistics Corridor Modelling: Time (2006)

Source: Author’s construction.
We also have to observe the vertical line at border crossings: there is less time lost because there is a relation between the price paid and the time spent there – cost decreases with time.

Let us now assess the North-South corridor.

Table 24. Corridor Level Assessment: Road n°3

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangkok</td>
<td>Chiangrai</td>
<td>3</td>
</tr>
<tr>
<td>Chiangrai</td>
<td>Mae Sai</td>
<td>3</td>
</tr>
<tr>
<td>Chiangrai</td>
<td>Chiangsaen</td>
<td>3</td>
</tr>
<tr>
<td>Chiangrai</td>
<td>Chiangkhong</td>
<td>3</td>
</tr>
<tr>
<td>Mae Sai/Tachilek</td>
<td>Mongla/Da Luo</td>
<td>1</td>
</tr>
<tr>
<td>Daluo</td>
<td>Kunming</td>
<td>3</td>
</tr>
<tr>
<td>Chiangsaen</td>
<td>Jinhong</td>
<td>2</td>
</tr>
<tr>
<td>Jinhong</td>
<td>Kunming</td>
<td>3</td>
</tr>
<tr>
<td>Chiangkhong/Hoeuy Xay</td>
<td>Bo Ten/Mo Harn</td>
<td>1</td>
</tr>
<tr>
<td>Bo Harn</td>
<td>Kunming</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Overall level</td>
<td>1</td>
</tr>
</tbody>
</table>

*Source: author's construction.*

We have a logistic corridor in the Thai part: the infrastructure and the legislative framework are aligned. At the border crossing, logistical costs increase; we are in a transport corridor. Since the weakest link in the chain determines the total level, we may conclude that road n°3 is a first-level corridor. If we know that the border is the weakest link, we have to ask how we can improve its capacities from an infrastructure and legislative framework point of view.

What would be the impact on this corridor if the time spent at the border were reduced? (see Table 25).

In order to know this cost, it is also necessary to include the risk dimension. To do this, we have developed a “reliability index” – there is no structure that can ensure transit from the origin to the destination; in zones where insurance does not exist, it is thus necessary to interview people in the field in order to gain their opinion about the reliability of a section of the corridor. There are three groups of people to be interviewed: State representatives such as customs officers for example, transporters, exporters and importers.

The graph below shows how things have progressed between Hải Phòng and Kunming since 2000 – case with only one border crossing; the more borders crossed, the greater the increase in cost (see Graphs 46 & 47).
## Table 25. Trends on the Bangkok-Kunming Corridor

<table>
<thead>
<tr>
<th>Bangkok - Kunming</th>
<th>$/tonne</th>
<th>Transit Time</th>
<th>Perception of reliability (based on 5 point scale)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R3W (via Myanmar)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 2000</td>
<td>$639</td>
<td>77 hrs</td>
<td>2.2</td>
</tr>
<tr>
<td>• 2006</td>
<td>$470</td>
<td>46 hrs</td>
<td>3</td>
</tr>
<tr>
<td>• 2015</td>
<td>$269</td>
<td>30 hrs</td>
<td>3.5</td>
</tr>
<tr>
<td>R3E (via Lao PDR)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 2000</td>
<td>$563</td>
<td>78 hrs</td>
<td>2.6</td>
</tr>
<tr>
<td>• 2006</td>
<td>$392</td>
<td>51 hrs</td>
<td>3.3</td>
</tr>
<tr>
<td>• 2015</td>
<td>$210</td>
<td>30 hrs</td>
<td>4</td>
</tr>
<tr>
<td>Via (Mekong River)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 2000</td>
<td>$406</td>
<td>128 hrs</td>
<td>2.7</td>
</tr>
<tr>
<td>• 2006</td>
<td>$270.5</td>
<td>88 hrs</td>
<td>3.4</td>
</tr>
<tr>
<td>• 2015</td>
<td>$107</td>
<td>70 hrs</td>
<td>3.7</td>
</tr>
</tbody>
</table>

Source: Author’s construction.


Source: Author’s construction.
Table 26. Hải Phòng-Kunming Cost and Time Breakdown (in %, in $)

<table>
<thead>
<tr>
<th>Hải Phòng - Kunming</th>
<th>Transport Cost</th>
<th>Port/ Border &amp; Transit Fees</th>
<th>Corridor Cost</th>
<th>Transport Time</th>
<th>Port/ Border Crossing Time</th>
<th>Corridor Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>76</td>
<td>24</td>
<td>100</td>
<td>55</td>
<td>45</td>
<td>100</td>
</tr>
<tr>
<td>2006</td>
<td>77</td>
<td>23</td>
<td>100</td>
<td>50</td>
<td>50</td>
<td>100</td>
</tr>
<tr>
<td>2015</td>
<td>80</td>
<td>20</td>
<td>100</td>
<td>52</td>
<td>48</td>
<td>100</td>
</tr>
</tbody>
</table>

Trends in the Hải Phòng-Kunming Corridor

<table>
<thead>
<tr>
<th>Hải Phòng - Kunming</th>
<th>$/tonne</th>
<th>Transit Time</th>
<th>Perception of Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>105</td>
<td>85 hrs</td>
<td>2.4/5</td>
</tr>
<tr>
<td>2006</td>
<td>87</td>
<td>58 hrs</td>
<td>2.7/5</td>
</tr>
<tr>
<td>2015</td>
<td>43</td>
<td>26.5 hrs</td>
<td>3.8/5</td>
</tr>
</tbody>
</table>

Source: Author’s construction.
The study was carried out in 2006 and we can see that the respondents were overall confident about the improvement in the corridors. The reading template for the Nanning and Hà Nội corridor also shows a reduction in time and cost at the border crossing. This typology systematically identifies the border as the weakest link.

The ADB was quick to realise that the legislative framework was not adequate; the regional Cross Border Transportation Agreement (CBTA) was thus proposed. Its principle is to reduce border inspections: a lorry is inspected at the border jointly by the country it is leaving and the country it is entering. The inspection concerns customs, immigration and quarantine. This single inspection significantly reduces time and cost.

Vũ Quý Sơn
Can you specify the role of the ADB in the GMS?

[Ruth Banomyong]
The ADB is the catalyser of development in this area. Its role is to grant loans, which have been justified by preliminary technical studies, to member countries. An understanding of the legislative framework remains the biggest constraint.

Khin Hnit Thit O O
Why doesn’t the ADB propose a harmonisation of the different legislations to the countries concerned?

[Ruth Banomyong]
Even though the initiated agreements have been ratified by all the States, they are not all properly implemented. The ADB has no constraining powers; it cannot ask States to modify their national regulations to match regional rules. The reality on the ground is that countries conclude bilateral agreements – Laos signed an agreement with Việt Nam, but also with Thailand: Laotian lorries may pick up merchandise in Thailand and deliver it to Việt Nam. The big difficulty is to know whether all the agreements are aligned, which also explains why border employees sometimes appear disillusioned.

Trịnh Thúy Hương
Are these criteria defined as goals to be attained and not a practical reality?

[Ruth Banomyong]
The aim of the research is to support operational staff in thinking about the concept of economic corridors. We have to see the system of regional development as a triangle: the governments (supply), the private sector (demand), and academics. We have to show that our input is important.
The workshop works in groups on the following questions: How can the Banomyong model be improved? Can we include cost, time and reliability dimensions in a single model? What other dimensions can be included to assess the performance of a corridor?

Each of the three constituted groups must prepare a PowerPoint presentation that includes a graph presenting the development of the model – they have 1.5 hours to do the work.

Day 3, morning of Wednesday 22nd July

2.3.3. A Historical Approach to the Corridors

[Hugues Tertrais]

I am going to bring a historical dimension to the term corridor, define it and then discuss it.

There is a significant difference between two words: map and territory. I myself have a large collection of maps, but with age and experience, the more I realise that maps are less neutral than territories! I am thinking for example about some archives I examined about the Japanese occupation of China during the Second World War. I notably studied telegrams from a French ambassador in Nanking who took up his post at the end of the 1930s in China; “If we look at the map, Japan spectacularly occupies China; however, the reality on the ground is radically different”. Maps are necessary and fundamental to understanding big concepts, but they are not sufficient. Corridors are more than a map, geographers employ the term “chorème” (the schematic representation of a space) – its construction is based upon an existing reality or on what we think the future will be. I published a “chorème” that represents the Asia-Pacific growth axis (see Map 24).

This growth axis is not a dream or a project, but the acknowledgement of a schematised reality. Outside of Japan, the four new industrialised countries (NICs) are South Korea, Taiwan, Hong Kong and Singapore. These four countries are aligned; all the pockets of industrialisation in Asia are located strangely enough along this axis – the industrialisation of China at the end of the 1980s took place along the coast. We can distinguish three main poles: to the north, Japan and South Korea; in the centre, Taiwan and coastal China; to the south, Thailand, Malaysia, Singapore and Indonesia.

Let us examine the reality of this growth axis. To what does it correspond? It might be the Asian development corridor. This corridor would follow a maritime route, but also an air one as the region’s main airports are aligned along it. The corridor enters the Pacific by the Malacca Strait and comes out through the Korea Strait. ASEAN countries only occupy the southern part of it.

When I speak about an axis or a corridor, I am pointing out a reality and not an artificially aligned project: it is because there are flows that I represent them on the map and not the other way round. The corridors we have spoken about are more representations of the future – the case of the Banomyong model. The difficulty in defining a corridor also comes from the fact that the corridor itself does not exist; it is a word.
I will develop three objects of reflection: the history of the word corridor; the constraints linked to their implementation and the challenges they present.

**Map 24. The Asia-Pacific Growth Axis**

Source: Author’s construction.

**History of the Word Corridor**

When we think about the concept of corridors or development, it evokes the question of traffic but also of energy and the possibility of using it.

Let us return to the colonial period. During this period, the word corridor was not used and there was not the same interest in development in the same manner as today. They talked about “enhancement”. This was essentially based on the construction of roads and railways – which were not an invention for the region.

Let us examine the Yunnan road whose aim was to link China to Southeast Asia, as does the Kunming-Bangkok corridor today. It was not a development corridor, but the construction of a railway between Hải Phòng, Hà Nội and Kunming. This railway had a uniquely commercial use. Its purpose was to drain trade from southern China to benefit the Vietnamese ports of Hải Phòng.
Development Corridors in ASEAN

and, why not, Sài Gòn. Diverting this traffic to the south of Việt Nam was the ambition of French business leaders at the period. The 1920s and 1930s spelled the arrival of international railway lines. I am thinking notably of the Singapore-Bangkok line that functioned as a traffic route between the two cities and not as a development axis. This line still exists today and is above all used for tourism.

In the so-called French Indochina, the big rail project was the “Trans-Indochina” linking Hà Nội to Sài Gòn and which was connected to the Kunming – Hà Nội line – in reality it was a line between Kunming and Sài Gòn. The line only entered into service in 1936. There were 1,800 km of line and the journey then took 36 hours. We can discuss the utility of these transport networks at this period. A certain number of French writers have insisted on the very “foreign” character of these traffic routes for the countries concerned. This concerns railways but also gravel roads. Paul Mus for example developed a whole line of thought about what he referred to as the “the Vietnamese Road” (Mus, 1950): it was a zone of contact between the French and the Vietnamese; on the road, the space is French, when we leave the road, it is Vietnamese. This road network was not in itself an economic development network; it was simply laid down on the country or countries that it crossed through. From then on, all sorts of circulation routes were imagined for rich European tourists to discover the country, which contributed to the building of these networks.

The following period was that of development poles. It was essentially the adventure of 1945 and the aftermath of the Second World War, at least in French Indochina. It became evident that the roads already traced contributed in no way to economic input. Japan was defeated, the country was in ruins and France then imagined a plan for Indochina that would allow it to industrialise the region around two poles: to the north, the Cẩm Phả region, near Hạ Long Bay; to the south, the Cam Ranh region near Nha Trang. Why these two regions and what is a pole of development? What was interesting about these two sites was their capacity for maritime exploitation with ports. Furthermore, they had a great capacity for the production of energy: Cam Ranh is near the city of Đà Lạt, which was the source of abundant hydropower; to the north, the presence of good quality coal ensured the massive production of energy. The war had put a stop to these projects but the ideas had persisted.

The end of the war in Indochina and the Bandung Conference in 1955 brought to the forefront the newly independent countries of Asia and Africa. In 1957, Thailand, Laos, Cambodia and South-Việt Nam decided, under the aegis of the United Nations (UN), to come together within a Mekong Committee in order to promote the economy and ensure social progress. The idea was not one of development corridors but one of using the great river to allow the production of hydropower. But, once again, the Việt Nam War spread towards Laos and Cambodia. It was only after the end of the Cold War and in the post-1990s that big development projects were once again undertaken in the region: the Greater Mekong project including Myanmar and also southern China.

**The Constraints behind the Implementation of Corridors**

The physical constraints are essentially linked to the configuration of the region and more specifically to the configuration of the Mekong River system.

The Mekong is one of the only, if not the only, big river in the world to be first and foremost a border river – it does not form a border in China, but it does between Myanmar and Laos as well.
as between Laos and Thailand. It then passes through Cambodia before meeting the sea in the south of Viêt Nam. The Mekong is not totally navigable: there is an obligatory break in continuity in northern Cambodia because of waterfalls.

I would like to remind you that historically the Mekong basin corresponded to the ancient Khmer Empire. Ever since the 13th century, a certain number of peripheral countries fed from this Khmer empire, until it eventually disappeared, thus transforming the Mekong, which had been hitherto a central river, into a border river. Let us finish with the constraints by retaining above all the fact that the corridors are solutions proposed to go beyond physical barriers.

One other principal constraint was the series of wars that affected the region until almost 1990; their effects still weigh heavily today on the reality of the region. From 1945 onwards, the system of circulation was disturbed. Communications between North and South Viêt Nam became difficult, which resulted in the great famine in the North. Roads then constituted the essential stakes of the Indochinese War. Certain roads were not yet completed, I am thinking in particular about the French road n°6 that was to link Hà Nội to Vientiane. In North Viêt Nam, the major preoccupation was to cut the roads in order to prevent the French from circulating, while the French were permanently hurrying to rebuild and re-open the road networks. We thus move away from the idea of transport corridors and circulation. Revolutionary powers settled in the border areas and in the confines. It was no longer possible to cross the borders; it was no longer possible to circulate. This situation only got worse with the second Vietnamese War between 1965 and 1972.

Let us take a look at the situation in 1967. I have chosen this date for two reasons: it was the year ASEAN was created with the Bangkok Declaration that thus founded this association between five Southeast Asian States; I was myself at this period in the region. I had come from France by road and my plan was to reach Bangkok. From there, I could enter Laos, a country which was difficult to get out of. Half of Laos was in the clutches of war, and every evening at 6 pm bridges were closed because they had been mined by the military. It was impossible for non-military staff to travel from Laos to Viêt Nam. I was able to enter Cambodia by car after eight days of travel. The region was completely closed off, the borders were fortresses. In the 1970s, the situation was comparable. The city of Đà Nẵng was not a city in Central Viêt Nam but a border town, situated just to the south of the 17th parallel. All the routes alignments that correspond to the corridors of today were the most closed-off places during this period. Road n°9 that today links Đà Nẵng to Moulmein was a highly secured war zone.

[Nathalie Fau]

In our book, there is an article about the East-West corridor between Laos and Viêt Nam. Our colleague Vatthana Pholsena wrote an article entitled “There is More than One Road” (Pholsena, 2014). The interviews conducted in the field with the local populations show that beyond economic development, there is also a feeling of rebirth – the road was associated with the war and massacres. The author distances herself from the idea of the ADB for whom the road simply signifies progress and economic development.
I would now like to introduce the idea of the stakes involved in the realisation of these corridors. How, in national terms, do people feel about the idea of corridors? One of the biggest stakes is the reduction of the obstacles that constitute borders between countries particularly at an economic level. In the region, the importance of borders is largely the legacy of wars. A second issue is perhaps the character more or less relevant to their path. Do the physical difficulties of getting to Moulmein from Đà Nẵng not make us doubt the “realism” of the axis? A third element of reflection might be the role of States in the development of corridors. Why not build a corridor within Vietnam? Today, corridors are only envisaged on a regional scale. Why not envisage corridors on a national scale? How do nations perceive these corridors? These questions touch upon supranational issues. Who decides and how? European construction was achieved with a dose of supranationality. How is this issue perceived at the State level? Finally, a more geopolitical question: Who profits from these corridors? For my part, I had the feeling, when studying ADB maps, that the region’s future remained Bangkok, located at the heart of these corridors. Việt Nam seemed to be absent from the original plan. Today, we get the impression that the city of Kunming is playing a leading role and we can observe a sort of bipolarisation in regional development.

Hugues Tertrais divides the workshop in groups. The work consists of raising questions about the articulation between the idea of international corridors and the national sensitivities of each country.

Day 4, Thursday 23rd July

2.3.4. The Economic Approach to Corridors

Our approach takes place prior to when the more technical and practical problems related to corridors occur; it is, however, at the heart of a historical process that resulted in the perspective of corridors in the region and the implementation of an integration process. My question is to discover the underlying development model before making a critical analysis of it. In order to give you the means to understand and critically analyse the current development model, we are going to carry out a theoretical and historical perspective.

Let us first introduce the subject.

The growth rate is an essential indicator.
Table 27. Gross Domestic Product Per Capita Growth – ASEAN Countries 1986-2011

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunei</td>
<td>-4.37</td>
<td>0.35</td>
<td>-1.08</td>
<td>-0.03</td>
<td>-1.26</td>
</tr>
<tr>
<td>Cambodia</td>
<td>4.54</td>
<td>3.14</td>
<td>4.89</td>
<td>7.83</td>
<td>5.59</td>
</tr>
<tr>
<td>Indonesia</td>
<td>4.98</td>
<td>6.15</td>
<td>-0.29</td>
<td>3.40</td>
<td>4.73</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>1.60</td>
<td>3.38</td>
<td>4.00</td>
<td>4.67</td>
<td>6.40</td>
</tr>
<tr>
<td>Malaysia</td>
<td>3.66</td>
<td>6.68</td>
<td>2.46</td>
<td>2.51</td>
<td>2.84</td>
</tr>
<tr>
<td>Myanmar</td>
<td>-3.60</td>
<td>4.42</td>
<td>6.96</td>
<td>12.20</td>
<td>9.52</td>
</tr>
<tr>
<td>Philippines</td>
<td>2.03</td>
<td>-0.17</td>
<td>1.33</td>
<td>2.50</td>
<td>2.96</td>
</tr>
<tr>
<td>Singapore</td>
<td>6.28</td>
<td>5.50</td>
<td>3.37</td>
<td>3.06</td>
<td>2.93</td>
</tr>
<tr>
<td>Thailand</td>
<td>8.44</td>
<td>7.55</td>
<td>-0.27</td>
<td>4.30</td>
<td>2.38</td>
</tr>
<tr>
<td>Việt Nam</td>
<td>1.96</td>
<td>6.11</td>
<td>5.64</td>
<td>6.35</td>
<td>5.67</td>
</tr>
<tr>
<td>ASEAN (aggregates)</td>
<td>4.84</td>
<td>5.63</td>
<td>1.28</td>
<td>3.74</td>
<td>3.94</td>
</tr>
</tbody>
</table>


In order to be relevant, this indicator must show the added value created over one year as compared to the number of inhabitants (GDP) and must be studied by taking into account the dynamism of the population. You can see in this table that the most developed countries in the region have slower annual growth rates than the less advanced countries. Their GDP being higher, it is necessary to add a large quantity of wealth to raise it. It is therefore difficult to obtain growth rates comparable to the so-called “take-off” rates that are observed in Myanmar and Laos for example. ASEAN is experiencing a high growth, even though it is slower than those of China and India; the region is better integrated into the world economy; growth fell in 1997 with the Asian crisis, in 2001 with the electronic crisis and in 2009 with the global crisis. The growth profile indicates to what extent the ASEAN economy is linked to globalisation and global demand. It is a case of “externally based” growth.

Other factors must also be considered as far as human development is concerned.
### Table 28. Selected Social Indices of ASEAN Countries: 1990, 2005, 2012

<table>
<thead>
<tr>
<th>Country</th>
<th>Human Development Index (HDI) value</th>
<th>Education index</th>
<th>Health index</th>
<th>Income index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brunei</td>
<td>0.782</td>
<td>0.855</td>
<td>0.620</td>
<td>0.757</td>
</tr>
<tr>
<td>Cambodia</td>
<td>N/A</td>
<td>0.543</td>
<td>0.391</td>
<td>0.520</td>
</tr>
<tr>
<td>Indonesia</td>
<td>0.479</td>
<td>0.629</td>
<td>0.380</td>
<td>0.577</td>
</tr>
<tr>
<td>Lao PDR</td>
<td>0.379</td>
<td>0.543</td>
<td>0.304</td>
<td>0.453</td>
</tr>
<tr>
<td>Malaysia</td>
<td>0.635</td>
<td>0.769</td>
<td>0.532</td>
<td>0.731</td>
</tr>
<tr>
<td>Myanmar</td>
<td>0.305</td>
<td>0.498</td>
<td>0.267</td>
<td>0.402</td>
</tr>
<tr>
<td>Philippines</td>
<td>0.581</td>
<td>0.654</td>
<td>0.581</td>
<td>0.679</td>
</tr>
<tr>
<td>Singapore</td>
<td>0.756</td>
<td>0.895</td>
<td>0.607</td>
<td>0.804</td>
</tr>
<tr>
<td>Thailand</td>
<td>0.569</td>
<td>0.690</td>
<td>0.413</td>
<td>0.599</td>
</tr>
<tr>
<td>Việt Nam</td>
<td>0.439</td>
<td>0.617</td>
<td>0.374</td>
<td>0.539</td>
</tr>
</tbody>
</table>


Progress may be observed in all the countries in the region. The distinction between growth and development was first made in the 1960s. Perroux defined growth as "... a steady rise over one or several periods of a dimension indicator" (Perroux, 1961). According to Perroux, in order to speak about development, it is necessary to integrate the combination of mental and social changes in a population because these are factors that make it apt – or not – to cumulatively and qualitatively increase its real global product. I believe for my part that development is a movement in both space and time. It involves structural changes in the conditions of production and distribution of revenues and a transformation of created value results from it.

In all the countries of the region, structural change is taking place. Between 1990 and 2012, Cambodia, Laos, Myanmar and Việt Nam continued their industrialisation process – these four countries are, nonetheless, still characterised by a high share of agriculture in their global GDP.

Another characteristic of ASEAN: its attractiveness for foreign capital. As a percentage of national investment, the entries of foreign investment can be very high: in Cambodia, nearly 40% between 2008 and 2011; in Việt Nam, the ratio today is higher than the regional average.

Although regionalisation is working well institutionally, things are less clear at the economic level.
Table 29. Export-Import Share and Trade Intensity Index of ASEAN and Selected Partners

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Export Share (%)</strong></td>
<td>Asean</td>
<td>18.94</td>
<td>24.41</td>
<td>22.98</td>
<td>25.33</td>
<td>25.03</td>
<td>25.92</td>
</tr>
<tr>
<td></td>
<td>China</td>
<td>1.82</td>
<td>2.69</td>
<td>3.84</td>
<td>8.05</td>
<td>10.85</td>
<td>11.35</td>
</tr>
<tr>
<td></td>
<td>Japan</td>
<td>18.89</td>
<td>14.23</td>
<td>13.44</td>
<td>11.12</td>
<td>9.84</td>
<td>10.27</td>
</tr>
<tr>
<td></td>
<td>Asean+3</td>
<td>43</td>
<td>44.44</td>
<td>43.93</td>
<td>48.32</td>
<td>50.01</td>
<td>51.96</td>
</tr>
<tr>
<td><strong>Import Share (%)</strong></td>
<td>Asean</td>
<td>15.2</td>
<td>17.95</td>
<td>22.47</td>
<td>24.34</td>
<td>24.17</td>
<td>23.18</td>
</tr>
<tr>
<td></td>
<td>China</td>
<td>2.93</td>
<td>3.04</td>
<td>5.05</td>
<td>10.5</td>
<td>13.58</td>
<td>14.77</td>
</tr>
<tr>
<td></td>
<td>Japan</td>
<td>23.13</td>
<td>23.45</td>
<td>19.08</td>
<td>13.95</td>
<td>12.23</td>
<td>11.05</td>
</tr>
<tr>
<td></td>
<td>Asean+3</td>
<td>44.42</td>
<td>48.88</td>
<td>51.4</td>
<td>53.47</td>
<td>55.98</td>
<td>55.24</td>
</tr>
<tr>
<td><strong>Trade Intensity Index</strong></td>
<td>Asean</td>
<td>4.06</td>
<td>3.32</td>
<td>3.68</td>
<td>4.24</td>
<td>3.74</td>
<td>3.57</td>
</tr>
<tr>
<td></td>
<td>China</td>
<td>1.21</td>
<td>0.78</td>
<td>0.94</td>
<td>1.23</td>
<td>1.2</td>
<td>1.27</td>
</tr>
<tr>
<td></td>
<td>Japan</td>
<td>2.82</td>
<td>2.53</td>
<td>2.45</td>
<td>2.35</td>
<td>2.34</td>
<td>2.36</td>
</tr>
<tr>
<td></td>
<td>Asean+3</td>
<td>2.84</td>
<td>2.35</td>
<td>2.38</td>
<td>2.39</td>
<td>2.18</td>
<td>2.18</td>
</tr>
</tbody>
</table>


Exports within ASEAN remain weak: only one quarter of total exports compared to about two-thirds for Europe. Economic integration implies a polarisation of trade, which is not yet the case for the region. China’s trade is rising considerably, both for imports and exports – we note a fall in Japan’s growth. Economic regional integration can be observed at the ASEAN+3 level – ASEAN, Japan, China and South Korea (Figuière and Guilhot, 2007, 2011; Chaponnière, 2014). The economic corridors are part of this context.

Connections are made through trade flows, which are themselves generated by the presence of multinationals that have built their factories particularly in the north of the region. The opening of the corridors encourages the arrival of foreign capital.

**Transport Infrastructures in the Development Economy**

The corridors are for the most part the fruit of international cooperation; they are mainly financed by development aid. Development aid and economic development are not necessarily linked: some countries have developed without relying on aid; others have received aid without developing.

What is international cooperation? According to Gabas, a development economist at Sciences Po, the term cooperation designates “an act jointly carried out by two institutions or countries that set together the same objective they intend to reach by combining their resources according to certain rules” (Gabas, 2002). Cooperation requires a common diagnosis of the difficulties and the belief that a
common action is more advantageous than two separate actions to resolve the difficulty. Human societies are mutually dependent whether they like it or not. Cooperation is the process through which we organise this mutual dependence rather than remaining passive to it – through the implementation of agreements, treaties and common projects.

The ambitions of Official Development Assistance are narrower and more precise. By taking priority over international cooperation at the end of the Cold War, this form of aid did more to create a disparity between the giver and the beneficiary; indeed, since the 1950s, aid became highly institutionalised. The United States’ Marshall Plan is often cited as a starting point for Europe. It became a statistical indicator; the Official Development Assistance (ODA) measures the flows of money registered at the OECD level by the Development Assistance Committee (DAC). The ODA meets four conditions: (i) it must originate from States, local communities or multilateral organisations (WHO, ADB); (ii) it must be to the benefit of developing countries and territories; (iii) it must be granted with the intention of serving development; (iv) it must be accompanied by favourable conditions: grants, loans with lower rates than those practised by banks.

We distinguish humanitarian aid, food aid, technical assistance, and project or programme aid. Thus, Official Development Assistance stems from the rich countries of the OECD and poor countries are the beneficiaries. An asymmetry occurs when international cooperation does not integrate this bipolar dimension. Gabas argues that the problem with aid is that the hand that receives is always beneath the hand that gives. However a – recent – dynamic is at work with the arrival of new emerging donors: non-member countries of the OECD are also playing the development aid card – China for example, or Brazil, or even Malaysia and Thailand since 1980.

Let us now examine a development chronology.

We are going to work on an applied exercise by comparing two examples of cooperation in Asia: the Colombo Plan of the 1950s and the GMS. Let us first of all fix the framework that you will use to compare the two models. The authors who have written about the history of development theory have identified several periods in development theory (Hugon, 1993; Charnoz and Severino, 2007):

- 1959-1965: the principal themes of aid concerned industry and infrastructure. Transport was at the heart of the issues.

Development theory sees the cause of underdevelopment as an insufficiency in investment. This dynamic encounters the absence of savings that would trigger the accumulation of capital in the developing country – the food-producing agricultural sector attracts the greatest part of economic activity. Economists during this period wagered on the creation of large-scale factories because they believed that a “sprinkling” of small investments would not lead to the accumulation of capital. In order to get production going, it is indispensable to create the infrastructures that will allow the production to be transported to the consumer. During the period of decolonisation, infrastructures were to become both the stakes and a lever for development, the sector then benefitted from significant funding via international aid – infrastructures are a crucial element for the development policy and control of a territory. Their development will go hand in hand with stronger political control, allow national construction in newly independent countries, as well as the organisation of economic flows and supply lines and, finally, facilitate the
flow of goods and raw materials. Small, rural farmers leave food-producing agriculture for more productive sectors. The Colombo Plan is a typical example of this development philosophy.

- 1965-1980: development is rethought through the inclusion of a social balance dimension – with particular attention paid to rural development.

Development aid began to develop the informal sector, which constituted a reservoir of jobs. This was reflected in a lot of technical assistance. The issue of infrastructure and transport is relegated to a secondary position – Why have such costly infrastructure programmes, if people are neglected? During this period a certain conception of the State’s role in the economy dominated (Musgrave, 1959):

* The State is the producer when it comes to public goods such as infrastructures, health or education – if the market was responsible for them, those who pay would benefit from them. The State may also be the producer of the resources that are indispensable to the population – oil, electricity;

* The State is a redistributor: redistribution of wealth, a progressive tax system in order to manage the rise in inequalities. Powerful instruments of redistribution are implemented: taxes not only on income but also on wealth and inheritance; social security redistributing to poorer populations, the sick and large families, etc.;

* The State pilots the economic situation: macro-economists create tools to slow down or accelerate the economy particularly from a monetary point of view – avoid "overheating" or revitalise. This implies the application of Keynesian mechanisms. The State deepens its deficit in difficult economic years – investments to feed consumption – then, when the economy takes off, it re-floats its budget through taxes.

- There was a sudden turning point in development thought in 1980 with Margaret Thatcher in the United Kingdom and Ronald Reagan in the United States. A new political economy came to power that was opposed to the previously developed Keynesian theories. The key author was Milton Friedman, who, since the 1950s, had been forging an “anti-Keynesian war machine”. This period marked the “neo-liberal” turning point, which was founded on the economic theory of monetarism. The market alone creates balances, in a perfect and automatic way. Supply and demand match each other mechanically without State intervention – the Chicago School. The governments then suddenly raised interest rates in the United States and in the United Kingdom: the debt crisis hit many South American countries, particularly Mexico. Development aid changed its tone, it began to accompany International Monetary Fund (IMF) interventions and impose structural adjustment programmes. The imposed reforms liberalised the markets and called for deregulation, privatisation and financial stabilisation.

The underlying problem was that the close control of inflation – the single objective of the monetarists – put a stop to growth. Imbalances were resolved by privatisation and many State burdens were eliminated: education and health services were attacked, notably in Africa. A new strategy for development was recommended: the promotion of exports in order to finance necessary imports. Some countries developed this strategy autonomously by choosing themselves the sectors; others witnessed the arrival of foreign multinationals who were to produce in
great quantity by profiting from cheap labour. The products of these enterprises were exported. The idea was a simple one: the exploitation of comparative advantages. The World Bank interpreted the economic success of Asia, and more particularly of Singapore, Hong Kong, Taiwan, and Japan, as the success of this export promotion strategy. The role of the State was limited to deregulating markets in order to facilitate the task of enterprises. All other types of State interventions were judged to be inefficient, illegitimate and even destructive.

- Since 2000, development aid has given priority to the fight against poverty to which we must add "good governance" – "Washington Consensus". We accept that the State plays a secondary role but it must be irreplaceable. Good governance became an indispensable ingredient to what might be good economic development. The corridors were created to promote access to transnational markets and the logics behind installation choices. Financing became less strictly private: it was accepted that in certain domains, it was in the interest of the public and private sectors to build together – public-private partnerships (PPPs). Where did this change come from? Some researchers consider it to have come from East Asia – States have organised production capacity through industrial policies. For my part, the lever came more from China where the State was the main pilot and whose success greatly impressed international organisations. It was what we refer today as the "Beijing Consensus". Can we then see this as a return to the past where the State was at the centre of national development? Absolutely not. The opening of borders and globalisation have created competition between territories and industries since the 1950s. The financing of State economies and enterprises has become increasingly linked to the international financial market and less and less to the national banking market. For the GMS economies, finding a place in the globalised economy is evidently difficult.

We are going to study together the Colombo Plan and the GMS. What do they teach about the evolution of the role of transport, of the development dynamic?

The Colombo Plan was developed in 1950 by members of the Commonwealth. The Commonwealth, which was created in 1948, brought together India, Pakistan and Sri Lanka – recently independent – Great Britain – which was feeling the loss of its colonies – New Zealand and Canada. The member countries did not wish to cooperate with South Africa because of apartheid. For its part, the United States was witnessing the arrival of communism in East Asia one and a half years after the victory of Mao Zedong in China and the rise of Uncle Hồ - Hồ Chí Minh – in Việt Nam. Southern countries were experiencing a moment of extraordinary historical reversal of achieving self-determination; the United States could "be present" only when the poor countries had decided amongst themselves – even though American intervention was expected because of its economic strength in comparison to England that had been much weakened by the war. The cooperation method was unique and spectacular: each country was asked to develop its own six-year plan, construct its own budget according to its needs and specify the sectors that it would finance itself – for example, the transport issue was essential in India, in Pakistan and in Sri Lanka and thus formed a principal part of their total budget. Other progress was to be made thanks to the financing acquired in the domain of agricultural export: mainly tea, sugar and rubber.
Elsa Lafaye de Micheaux proposes some group work aiming to compare the Colombo Plan and the GMS. The trainees must answer the following questions for each of the two programmes: What are the objectives of the cooperation programme? What problems did the countries face at each period? What are/were the methods of financing? What was the role of transport? Using the analyses as a basis, the aim is to determine the evolutions of the cooperation policy and the development vision. The workshop is divided into two groups and then into two sub-groups: the first answers the questions for the Colombo Plan, the other for the GMS. A comparison of their answers stimulates debate (Cohen, 1951; Huyck, 1953, Benham, 1954, Basbh, 1955 Colombo Plan Secretariat, 2010; Lafaye de Micheaux, 2013).

Four major axes of evolution may be identified at the heart of corridor policies, transport policies and development projects:
- Moving from modal infrastructures to integrated intermodal corridors;
- Moving from national planning to the corridor as a tool for regional integration;
- From a tool for national development, the corridor becomes a tool of competitiveness in globalisation;
- In terms of financing, planning remains public; governance becomes complex and consists of public and private funding – example of PPPs.

Finally, we can observe dynamics that reflect the evolution of academic thought about transport, development, development aid practices and ideological swings concerning the role of the State.

[Stéphane Lagrée]
Did the Colombo Plan result in an increase in inequality? Or was there indeed an effort to allocate capital? How can we compare it to the GMS?

[Elsa Lafaye de Micheaux]
For the Colombo Plan, many countries were implementing socialist policies – Nehru in India and Jayawardene in Sri Lanka were careful to redistribute wealth. These governments had introduced democracy and were anxious to fulfil the mandate they had been given. This is not the case in the GMS where there is a clear widening of inequality. The GMS is part of a development concept where the market plays the leading role and shares growth. This issue leads us to governance and the effects of development aid that we will address in the practical work.

[Vũ Quý Sơn]
We might add the supporting role of financial institutions. For the Colombo Plan, international financial institutions are not involved, whereas they play an essential role in the construction of GMS corridors.
[Elsa Lafaye de Micheaux]

The Colombo Plan is mainly based on State budgets, even though the International Bank for Reconstruction and Development (IBRD) was present at the period.

Integration of Space in Economy

The concept of space was forgotten for a long time by economic theory, whereas the concept of time has been developed by classical authors such as Keynes, Ricardo and Marx.

The national economy is a central axis of economic theory. This framework allows us to count and reason about mechanisms. At the micro-economic level, we talk about enterprises and consumers. We put ourselves at the level of individuals. The consumers thus represent demand and producers supply. The market appears as an abstract place where they meet. For more than a century, the spatial dimension was not included in economic theory: the model of a market of pure and perfect competition assumes a homogeneity of products. Introducing the concept of space brings into question the homogeneity of products. Some economists have thus begun to realise that the question of the location of enterprises does not have the same effects and this is in function of space (Krugman, 1991 and 1993; Arthur 1988 and 1990).

Furthermore, basic economic models assume constant returns to scale. However, taking into account the spatial dimension has lead to the appearance of increasing returns to scale. What is this all about? The economists of the new geographical economy showed that in function of the place where the enterprise is located, there are "geographical agglomeration externalities". These externalities explain the economic interest of corridors. Let us examine the model of Krugman who was awarded the Nobel Prize in Economics in 2008 for having demonstrated the effects of economies of scale on models of international trade and the localisation of economic activity. I have used this research to explain, for example, the arrival of electronics in Penang (Malaysia) in the 1970s. This model has been notably used to explain the development of Silicon Valley in California or the film industry in Los Angeles. In reality, we have to understand that enterprises choose where they go and their choices are often made in function of space. Krugman distinguishes two types of assets:

- The first advantages correspond to the objective qualities of the place for the needs of the enterprise – heavy production will need the presence of a port. The advantage here is of a physical nature. The same reasoning may be used for the labour force or labour competence: the interest that a region will present for an enterprise depends – in function of its own preferences – on labour cost, productivity and the competences that are grouped there. This is, at the outset, an asset/characteristic that is specific to the place (First Nature);

- The second advantages are linked to agglomeration externalities: the more enterprises you have in the same place, the more you benefit from the situation. For example, all the potters are grouped together in the village of Bát Tràng, located near Hà Nội. This contributes to the construction of a virtuous circle of benefits and growth. The geographical theory states that the diminution of transport costs results in the agglomeration of enterprises in the same place.

What are the advantages of having so many enterprises in the same place?
Xiong Maiyer

It is possible to negotiate prices.

[Elsa Lafaye de Micheaux]

Indeed, and you can discuss the quality very easily. Know-how is also more widely shared. The suppliers and subcontractors of the agglomerated enterprises will eventually try to join the field of activity, which will stimulate technical progress. They may also create infrastructures together – the case in Penang of HP, Hitachi and other electronic companies who compete with each other throughout the world and who got together to create a joint training centre for electronic workers. Communities will facilitate the development of these enterprises, the general context will be particularly favourable – snowball effect. Krugman and Arthur claim that the agglomeration is created purely by chance (Arthur 1990; Krugman, 1993). I personally believe that development corridors may be interpreted as catalysts of fortunate coincidences that trigger the virtuous dynamic of the agglomeration. Indeed, the corridors reduce transport costs and the Special Economic Zones (SEZs) have an undeniable attractive effect – “industrial cluster” dynamic.

_ Elsa Lafaye de Micheaux proposes to divide the workshop into three groups before starting work on the three following topics:_

- Analysis of the geographical simulation model: Uses of this model? Why create the EWEC corridor? Impact analysis and discussion about methodology;
- GMS financing methods: How can we define the investment framework in the GMS from 1992 to 2014? What is the new investment plan for the 2015-2020 period? Why should we prioritise PPP funding?
- The impact of the GMS on development: Presentation of the principal results. Can they be attributed to the GMS? In what conditions can the GMS encourage development in the region? Critical appreciation of the presented results.
Day 5, Friday 24th July

The day is divided into two parts: final feedback by the trainees on the exercise set by Elsa Lafaye de Micheaux the previous day; impact study of the corridors on the development of the cities through which they pass – case of the East-West corridor using a methodology developed by Nathalie Fau and Elsa Lainé in the framework of a thesis about twin cities.

2.3.5. Geographical Approach to Corridors

[Nathalie Fau]

For the ADB, the development of corridors must contribute to the modification of urban hierarchies by allowing cities to access the functions from which they have been hitherto excluded. The ADB pays special attention to the strengthening of small and medium-sized cities located along the corridors. Among these cities, it distinguishes:

- Border cities. These cities have been isolated for a long time owing to conflicts. Most of them correspond to marginal areas according to a centre-periphery model – example of Bangkok. Laos is an exception to this rule: all the cities in this country are situated along the Mekong that serves as a border. They are generally located opposite small cities whereas they are big cities on their territory. These border towns attract the most investment; they are an interesting indicator to assess the openness and the impact of the corridors;

- Commercial nodes. These are cities that suddenly acquire new commercial functions due to the implementation of a corridor – they are also border cities;

- The nodes. These are “gateways”, or exits to the corridors. The ADB maintains a continuing interest in the “gateways” and particularly those that are situated at the intersection of a land route and a maritime route. They link mainland Southeast Asia to the rest of the world;

- Cities at the intersection of corridors. The ADB is trying to give priority to these cities because of their potentially strategic locations – case of Khon Kaen in Thailand at the junction of the North-South and East-West axes.
Map 25. Development of Towns in GMS Corridors

Source: Author’s construction.
At the outset, ADB’s policy was to give priority to the twin cities along the five corridors. Over the 2012-2014 period, 15% of the scheduled ADB funding amounts were directed towards these spaces.

The typology that we developed in the framework of the Transiter programme is a little different from that of the ADB. We focused particularly on three types of nodes that structure the internal functioning of the corridors: gateways, twin cities and urban pairs. The map entitled “The Corridors Network of the GMS and the Malacca Straits Region” presented in the plenary session throws light upon these different types of cities. The gateways are generally experiencing the strongest economic development. Regarding these gateways, it is interesting to remark that there are both already well-established poles but also emerging ones. The North-South corridor gateways (Kunming, Bangkok and Hà Nội) and South (Bangkok and Hồ Chí Minh City) are consequently cities with several million inhabitants with regional importance that have been historically integrated into trade networks. These metropolises, which did not used to be linked to each other, are now increasingly connected, which has encouraged development in synergy. Their inclusion in the GMS directly contributes to the strengthening of their regional weight as they have taken on new functions to encourage articulation between the different corridors, and also between continental and maritime flows. Christian Taillard has assessed their new respective weights by identifying the number of economic corridors governed by each of the metropolises. Bangkok and Kunming, which are at the crossroads of at least three corridors, stand out quite distinctly from the other metropolises.

The “Twin Cities” are often small cities situated opposite each other – with the notable exception of Vientiane. Finally, “Urban Pairs” are cities located in the hinterland that may benefit from development because of the border – the case of Khon Kaen in Thailand.
Lastly, we can note that the corridors modify the hierarchy of cities at the national level – the case, for example, of Mandalay in Myanmar at the junction of two corridors and which benefits from its position to develop independently from Yangon.

Let us examine the East-West corridor. Several types of cities may be observed: gateways – Đà Nẵng and Moulmein – and the twin cities Lao Bảo and Dansavanh, Savannakhet and Mukdahan or Mae Sot and Myawaddy (see Map 26).

This corridor is about 1,500 kilometres long. It is unique in that it does not cross through any big city: this is a deliberate choice of the ADB in order to observe whether or not the positioning of such a corridor favours the development of small cities. Japanese aid has essentially contributed to the development of infrastructures along the corridor – the port of Đà Nẵng, the tunnel between Đà Nẵng and Huế and the bridge between Mukdahan and Savannakhet.

**The Gateways**

The East-West corridor favours the emergence of new poles by designating as gateways cities of lesser importance on the regional scale such as Moulmein or Đà Nẵng.

Why is it important for a city like Đà Nẵng to be a gateway of the East-West corridor? The city, located in Việt Nam’s Central region, was hindered in its economic development for a long time as a result of the dual metropolisation of the country around the capitals of the north, Hà Nội, and the south, Hồ Chí Minh City. However, its new regional role as a gateway to the East-West corridor and the improvement of links with Bangkok have allowed it to access international functions that were hitherto monopolised by the other two big Vietnamese metropolises. The objective is for Đà Nẵng to become an exit gate for Laos and Thailand, for it to benefit from the opening of borders and the acceleration of trade flows along this axis. The problem lies in the fact that there are other competitive routes along the East-West axis (see Map 4).

- The maritime route. The idea of the ADB promoters was to have all flows pass through Đà Nẵng. However, it is a lot more profitable to pass through Bangkok and take the maritime route from Hải Phòng. Maritime routes still remain the dominant mode of transport for trade flows between Thailand and Việt Nam. This choice may be explained by the coastal location of production and consumption zones, by the low transport costs and by the nature of the products traded;

- The route identified by Ruth Banomyong: this route is currently the most used by the private sector. This itinerary that links Bangkok to Khon Kaen then becomes part of the East-West corridor by running along road n°9 through all the Laotian part and then joining the Vietnamese meridian motorway to arrive in Hà Nội without going through Đà Nẵng.

Studies on the flow along the Đà Nẵng-Pakse-Bangkok axis have highlighted its current lack of use. For Đà Nẵng to exist as a gateway, a corridor alone is not enough; an active Vietnamese government policy is also necessary.

Research by Christian Taillard and Nguyên Tùng shows that the acceleration of the Đà Nẵng metropolisation process is not only the result of its new regional status, but above all because of the choices and huge intervention of the State.
The State, which is looking to create the necessary conditions for Đà Nẵng’s metropolisation, separated the city from the province of Quang Nam and, in 1996, raised its status to the level of an “autonomous city dependent on the central government”. In 1997, it defined the “key economic zone of Central Vietnam” that aims to create synergies between the cities of Đà Nẵng and Huế in order to increase the competitiveness of the Central region and constitute a bipolar urban region capable of mobilising investment in a sustainable manner. The construction of a tunnel under the Ocean Cloud Pass has resulted in the improvement of connectivity between the two cities.

The State is also financing the development of interface infrastructures, both ports and airports. The container port should become the corridors’ exit gate. Flows have increased from 30% to 40%. There are now direct international liaisons from and to this port – which strengthens its weight in the region, as traffic used to have to transit via Hồ Chí Minh City or Bangkok.

Finally, the State invested in the elaboration of development plans and in the funding of urban infrastructures, bridges, four-lane roads and the development of riverbanks.

Metropolisation factors first met the needs of transnational positioning and of public and institutional interventions. It was necessary to await the beginning of the 2000s for national and foreign private investors to take over the task.

In order to measure these changes, we focus on markers of internationalisation:

- The criterion of evolution of urban change: international cities are polycentric – idea of the Đà Nẵng-Huế dual centre;
- The criterion of change in construction type: implementation of a business centre, commercial centre, international standing hotels, specific urban amenities such as river or sea fronts, the construction of condominium type housing;
- The criterion of change in infrastructure: it must be able to concentrate large flows such as motorways or a massive public transport system;
- The implementation of specific infrastructure such as international zones, business centres, technopoles, etc.

The identification of these markers of internationalisation is based upon an analytical framework that we jointly elaborated in a research group working on “minor metropolisation”, that is to say on second-rank cities that have been transformed by metropolisation. These studies have been published in *Territoires de l’urbain en Asie du Sud-Est, Métropolisation en mode mineur*, under the direction of Manuelle Franck, Charles Goldblum and Christian Taillard (2012).

This example is interesting as it emphasises the central and local government’s wish for internationalisation. This deliberate move towards modernity has been followed by support from the private sector – example of the opening of a Novotel. A political will shown by the government is necessary. The other gateway is Moulmein.
The above-mentioned doubts for Đà Nẵng are even greater in this case, as it is a small city that does not have the capacity for a deep-water port – a structure that has, however, been developed in the neighbouring city of Kalagauk.

On the ADB map linking the cities of Southeast Asia, Moulmein does not even appear in the plans (see Map 20). This gateway is far from being able to benefit from its status to rise in the urban hierarchy of the region.
Twin Cities

Twin cities are located on either side of international borders. Border cities were created to ensure the function of sealing the border. How are these cities going to evolve now that these borders are open? Are they going to evolve at the same pace? Will there be international agreements between these cities for wider development? The ADB’s policy is notably directed towards funding these Special Economic Zones (SEZs) on borders. They are often bonded zones that can facilitate industrial development. Since 1994, the ADB has funded 41 SEZ projects mostly in border areas (Ishida, 2013). The research of Ishida takes a look at almost all the border twin cities in Southeast Asia. Two types of models are identified:

- For the most developed countries in the region the aim is to develop the outskirts and strengthen regional integration – the case of Thailand or Malaysia;
- For the least developed countries, the aim is to create national development poles – the case of Cambodia, Laos and Myanmar. In these countries, the success of border areas depends on the wealth of the neighbouring country. The idea is to capture the wealth of the neighbouring country at the border, in order to ensure the country’s own economic development.

Let us focus on the twin cities of Mukdahan in Thailand and Savannakhet in Laos.

Diagram 23. Research Questions

Source: Lainé (2013).

Three scales of analysis must be considered: the city, the twin city itself, the country (even the region). It is necessary to know the factors of internationalisation, their rhythm and the urban impact that results from it.
Shared Challenges for Development within ASEAN

Diagram 24. Methodological Point: Internationalisation Process

The internationalization process will be studied at the urban scale.

Source: Lainé (2013).

For our twin city, let us bear in mind the opening of a cross-border bridge in 2007 and the unequal development between the two cities – Savannakhet has been experiencing spectacular development since 2007. Mukdahan is a small city located in the northeast of Thailand, one of the poorest regions from an economic point of view. On the contrary, Savannakhet is the second biggest city in Laos; it is located on road number 13 that runs along the Mekong, the economic centre of Laos.

What is the political strategy of the two countries in relation to the borders? Thailand is characterised by a dual coherence – Dual Track Strategy – from the point of view of its regional integration and the development of its peripheral zones. Ever since its ninth national plan (2002), there has been a real willingness to give priority to the development of the border provinces located along the East-West and North-South corridors. The Thai government is using these corridors as a supplementary tool for the development of its outlying provinces and for the decongestion of the Bangkok metropolitan region. It is encouraging the creation of border twin cities by massively investing in cross-border transport infrastructure: a cross-border bridge similar to the “Friendship Bridge” between Nong Khai in Thailand and Thanaleng near Vientiane, or even border-crossing bus routes, all of which aim to facilitate border crossing.
This policy also includes the Thailand+1 strategy: the idea is to open economic zones just on the other side of the border where labour is cheap. Specialised industries with a high added value remain in Thailand whereas less technical industries are relocated.

In Laos, the border policy is part of the policy for the development of cities and particularly secondary cities – ADB project. Since secondary cities are located at the borders, the political programme is duplicated.

The two provincial capitals diverge in their national integration – as much in demographic terms as in per capita income.
The two cities have developed on both sides of the border. Traffic between them was done by ferry for a long time and the two historical centres were located around the embarkation points. The opening of the bridge in 2007 disrupted this organisation.

Before 2007, Savannakhet presented few signs of internationalisation: the building of a new modern market using Singaporean funding, an administrative centre financed by the ADB and a new national stadium – the latter was furthermore given as compensation for environmental damage caused by Australian mining in the region. The construction of the bridge, which began in 2004 and completed in 2007, aimed to strengthen links between the countries and the two cities. The new economic zone in Savannakhet was built in the extension of the bridge: it is the economic centre of the city that has moved from the ferry port towards the new bridge.

On the Mukdahan side, the city has not changed its centre. A casino was opened in 2009 using Macau funding (60%), Laotian government funding (20%) and private Laotian funds. The project was mainly built for Thai clientele. A system of ferryboats has been implemented between Mukdahan and the casino – and even Bangkok, as it is forbidden to gamble on the Thai side of the border. Let us take this opportunity to point out that on the Cambodian and Laotian borders, the two most dominant forms of economic development are the casinos that have proliferated there because they are forbidden on the other side of the border, and SEZs that seek to attract foreign investors through the implementation of tax exemption policies and the deregulation of social legislation, which has no equivalent in the Asian region. However, in both cases, these zones function more like enclaves than growth poles and are far from encouraging growth spillover, as they are totally disconnected from their regional environment. As for the casinos, they feed above all a cross-border economy of illicit trafficking. The city of “Golden Boten”, located in the “golden triangle” zone on the Chinese-Laotian border, is thus a Chinese enclave on Laotian territory entirely dominated by the Chinese drug baron, Ling Mingxian. However, it is not only a popular holiday destination for the Chinese, but also and above all a centre for money laundering, prostitution and drug dealing.
From an institutional point of view, the two cities are “Twin cities”. Trade has increased between the two countries, 35% of flows between Thailand and Laos now pass through the Mukdahan-Savannakhet twin cities. However, foreign investment in Mukdahan is a lot less than that invested in other cities in Northeast Thailand. The big difference between the two cities is that Savannakhet is a node in the Laotian urban hierarchy, whereas Mukdahan is on the Thai periphery. The latter has to compete with other cities in the region and attracts almost no foreign investment. One project will create an international airport between Laos and Thailand in order to disseminate the industrial success of Savannakhet towards Mukdahan.

Let us take a quick look at the example of Mae Sot in Thailand and Myawaddy in Myanmar. In this case the model is the opposite: Mae Sot functions well, which is not the case for Myawaddy. Border trade is correlated with the quality of diplomatic relations between Thailand and Myanmar – in the case of Myanmar, the regional integration policy must also be taken into account. 80% of exports and 70% of imports of this country are linked to four countries: Thailand, China, India and Singapore. The border crossing in Mae Sot represents 55% of the land flows between the two countries.

We estimate that about 400 industries are represented in Mae Sot among which mainly figures the textile industry that is manned by temporary immigration from Myanmar – about 20,000 workers. These are mainly female aged on average from 20 to 30 years old. The migrants do not only come from Myawaddy but also from other more distant regions as far away as Yangon.

Why develop an industrial zone in Mae Sot and not in Yangon? Firstly, because the salaries of Burmese workers in Mae Sot are five times higher than those of workers employed in the same industries in Yangon. Indeed, the enterprises on the Thai side are obliged to pay the migrants the country’s minimum wage. For manufacturers, the choice stems from a logistical problem. It is a lot easier to connect production to the region’s big distribution axes from Mae Sot via Bangkok than from Yangon: Yangon has no direct link with Japan and must transit through Singapore – which results not only in extra costs but also hampers daily links. In the same way, from Yangon, raw materials need to be imported from Thailand whereas they are available in Mae Sot. Finally, a big constraint for investors is the very poor quality of infrastructure in Yangon.

Infrastructure has been built in Myawaddy but the government has not given it the status of SEZ: taxes, customs, and lengthy controls at the border. This does not encourage investment on this side of the border.

There are some plans for an industrial zone – the Hpa-an project – but the salaries are not attractive for Burmese workers.

Studies have been carried out on the Ayuttaya-border-Yangon segment. The problem is the waiting time at the border – lorries are not allowed to cross the border, which means transferring the merchandise.

Let us now look at the last twin cities, Dansavanh in Laos and Lao Bảo in Việt Nam.

In this case, there was a failure on both sides. It is due to the environment in which the two border towns developed.
Vietnam implemented a policy to develop its economic zones; there are four types:

- **Industrial Parks**: zones with bonded factories used for processing before export;
- **Export Processing Zones (EPZs)**: entirely bonded zones. There are only three of them in Ho Chi Minh City;
- **Coastal Economic Zones (CEZs)**: zones of more than 10,000 hectares located in coastal or island regions;
- **Border Gate Economic Zones (BEZs)**: zones of more than 10,000 hectares located in border zones.

The first border zone was established in Mong Cai – on the border with Guangxi (China) – following a decision by the central Vietnamese government. The objective is to "appease" the borders, to attract foreign investment and assert the presence of the Vietnamese in the zone.

Lao Bao is a region with a low population density and inhabited mainly by non-Kinh Vietnamese. The region is poor, mountainous and marginal. The same observations may be made for the Laotian side. Both governments have taken measures to try to encourage investors to settle in these zones: on the Lao Bao side, the creation of a special industrial zone (2005) directly administered by the central government and not by the local government; on the Dansavanh side, creation of a border zone and a package of measure to attract investors. The objective was to create a big commercial and industrial zone:

- In Lao Bao, there has been a modest commercial development; there are few industries present. There is little available labour, the city is disadvantaged by the distance that separates it from the main export ports. Furthermore, there is strong competition from the other Vietnamese borders that have a more favourable environment for investment;
- In Dansavanh, there has been a resounding failure. No project has come to fruition because of the lack of basic infrastructures and human resources; what is more, the city is in competition with Savan Seno and its SEZ.

Relations between the two cities are above all symbolic. Most flows are unofficial and illegal. Banomyong has already pointed this out. There should have been an experimental zone to allow free trade flow in the region: this was made official at an institutional level but the legislation has never been implemented by customs officials.

Let us now take a look at the possibility of the sustainable development of these border zones.
Three stages have been identified:

- The border is closed, no development is possible as no flows are possible on either side of the border;
- The border is open and flows are facilitated in the crossborder zone;
- Integration between the two countries is facilitated: transport infrastructures are good both in the cross-border zone and in the country’s urban centres. At this stage, the economic zones of the cross-border regions risk decline and shift towards economic poles that are now more accessible. The fear is that these industrial poles will only be temporary and disappear as soon as new infrastructures allow a return of the industrial centres.

The same question regarding sustainability may also be asked about bonded commercial zones. If the trend is towards a complete integration of the countries, these zones will no longer have a reason to exist, as the customs barriers will cease to exist.
The third case that raises most questions is that of border tourism, particularly with the development of casinos that do not bring any financial benefit to the rest of the country. Who profits from it? In Boten in Laos, the government has decided to close the casino as it was bringing no economic development to the zone and was a Chinese enclave on the territory: financed by China, built with Chinese labour and used by Chinese clientele.

Nathalie Fau presents the methodological framework used to carry out her analysis of border zones.
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<td>Achievements and mechanisms in the framework of the GMS that are part of the reclassification of border cities</td>
<td>Primary sources: ADB documents/Secondary sources: integration and regional cooperation studies in Southeast Asia</td>
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<td></td>
<td>Articulation between national and regional strategies</td>
<td>Primary sources: government planning documents (national plans)</td>
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<td></td>
<td>Reconfiguration of border spaces by flows (trade, FDI, development aid, migration and tourism)</td>
<td>Trade flows; database of the Thai Ministry of Trade and customs data/flows of capital: Board of investment data, Thailand, Chambers of Commerce and Planning Departments, Laos/Official Development Assistance in Laos: donors’ technical reports and interview with NEDA in Thailand/Migratory flows: ILO technical reports in Thailand</td>
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<td>Redefining the role of the border</td>
<td>Characterisation of border provinces in national spatial organisation</td>
<td>Secondary sources: Atlas of Thailand and atlas of Lao PDR; statistical data (demographical and economic characteristics)</td>
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<td>Genesis of the border</td>
<td>Secondary sources: historical studies</td>
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<td>Players and public policies in the border cities</td>
<td>Planning in border cities at several levels (national, regional and local)</td>
<td>Data from public authorities: national plans (NESDB in Thailand), regional master plans, local plans</td>
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<td>Articulation between local and central authorities; role of municipalities in urban development</td>
<td>Secondary sources for decentralisation: for the prerogatives of decentralised authorities: interviews with the municipalities</td>
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<td>Urban reconfiguration by private players; identification of markers of internationalisation</td>
<td>Location of equipment (observation and list of activities)/Interviews with the Chamber of Commerce and investors</td>
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<td>Internationalisation and change of scale of border cities</td>
<td>Stages of urbanisation: identification of rhythm of urbanisation and disruptions; new forms produced</td>
<td>Extension of urbanised area: comparison of plans at different periods and historical sources/Modernisation: observation/Urban development: interviews with the municipalities</td>
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<td></td>
<td>Trans-border interactions</td>
<td>Integration through flows: trans-border trade data/Institutional cooperation: interviews with local authorities</td>
</tr>
<tr>
<td></td>
<td>Trans-national dynamics and forms produced</td>
<td>Location of economic zones/Origin of foreign investors</td>
</tr>
</tbody>
</table>

*Source: Lainé (2013).*
<table>
<thead>
<tr>
<th>Dynamics to be assessed</th>
<th>Retained criteria</th>
<th>Indicators or characteristic elements</th>
</tr>
</thead>
</table>
| Degree of symmetry in the localising of urban forms produced by internationalisation | Location of principal amenities | Equipment linked to bridges  
Industrial (SEZ) equipment and tourist amenities  
Commercial function: principal markets, except local products |
|                         | Orientation of urbanisation dynamics and location of new centralities | New urbanisation axes: new entries to structuring cities and principal road axes  
Spaces under construction, being made denser or re-classified  
New centralities at bridgeheads or at intermediary positions in relation to old centres |
| Stages of urbanisation and rhythm of internationalisation | Phase 1: Implementation of conditions for internationalisation, with government policies as a motor and the place of the city in the national urban hierarchy  
Phase 2: expected relays from the national and international private sector, with as a motor, the management of national and, increasingly, transnational flows |
| Types of interaction on a twin-city scale | Fluidity of border passage | Distance between the historical centre and the border bridge  
Occurrences of border closure for security reasons |
|                         | Institutional cooperation to encourage cross-border integration | Implementation of cross-border transport of goods and people agreement (CBTA)  
Rationalisation of investments: functioning in synergy (joint projects)  
Other forms of specific cooperation |
|                         | Scale of integration by flows | Volume and nature of flows, eventual functional specialisation  
Origins of committed players |

Source: Lainé (2013).
The trainees discuss in groups and pool together their avenues of reflection in order to elaborate a final presentation of their activities and the knowledge they have acquired for the next day’s final summary in plenary session.

We greatly appreciate the work we have done with you this week. The diversity of nationalities was a great richness and adopting a different disciplinary approach each day, for the same subject of study, is exceptional in the university sphere.

**Working Papers**

Analytical framework of the corridors established by Nathalie Fau in the framework of the French National Research Agency-funded Transiter.

Methodological framework for the study of border cities in Thailand: research axis, indicators and types of source, established by Nathalie Fau and Elsa Lainé in the framework of the National Research Agency-funded Transiter and the thesis by Elsa Lainé, *The role of Mekong valley border cities in the Thai strategy to control the Greater Mekong Subregion (GMS)*, defended in December 2013.

**Reading Material**

Banomyong, R. (2001), *Modelling Freight Logistics: The Vientiane-Singapore Corridor*, Department of International Business and Transport Management, Faculty of Commerce and Accountancy, Thammasat University, Bangkok, Thailand.


Selected Bibliography


Charnoz, O. and J-M. Severino (2007), L’aide publique au développement, collection Repères, La Découverte.


Lainé, E. (2013), Le rôle des villes frontalières de la vallée du Mékong dans la stratégie thaïlandaise de commandement de la Région du Grand Mékong, doctoral thesis in Geography, INALCO.


Shared Challenges for Development within ASEAN

Texts online (GEMDEV’s archives)


(article on line: http://joeg.oxfordjournals.org/content/11/2/333.full.pdf+html)

Websites

https://aric.adb.org/
http://www.gms-eoc.org/
## List of Trainees

<table>
<thead>
<tr>
<th>Surname and first name</th>
<th>Institution</th>
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<th>Research theme</th>
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<tbody>
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2.4. Cities and Climate Challenges

Hypatia Nassopoulos – EIVP,

(Transcript)

Day 1, Monday 20th July

The first part of the morning is devoted to introducing the trainees and trainers (see trainers’ biographies and the list of trainees at the end of this chapter); the overall issues to be dealt with and the week’s programme are also presented.

2.4.1. Integration of Adaptation to Climate Change in the Design of Urban Development Projects: New Tool(s) and New Specialist(s)

This first session about the current major approaches of French research on adaptation to climate change highlights the multidisciplinary character of the climate change challenge and the need to mobilise a wide variety of research disciplines. At the end of some iterative work based on data from the Observatoire National sur les Effets du Réchauffement Climatique (ONERC), 24 projects were selected for analysis – ONERC indexes the research projects of consortiums with French partners that stem from public or private enterprises and research institutions. Advanced research allows us to use diverse criteria such as the sector in question, the considered environment or the type of research being carried out.

[44] The content of the presentations by Hypatia Nassopoulos, as well as the illustrations used during the training and the present transcript, are also the work of Mrs. Colombert (EIVP), Gantois (City of Paris), Jacquet (Egis Concept), Jojo (EIVP), Leseur (CDC Climat), Mangeot (EIVP), Meunier (Egis Concept) and Salagnac (CSTB). The Adaptatio project team would also like to thank the French Ministry of Ecology and Sustainable Development for the financial support it provided.
Key information is selected: each project’s “identity” (consortium, research duration, financing mechanisms, research programme, etc.); objectives and context (objectives of the research being carried out; used or suggested definitions for adaptation to climate change, climate hazards, etc.); scales and sectors (spatial analysis scales, time scale, environments and geographical places, analysed sectors, etc.); adopted methodology (types of research carried out, applied methods, etc.) obtained results (scope of the obtained results, possible uses, limits and difficulties, valorisation, etc.).

[Hypatia Nassopoulos]

The Adaptatio project was financed by the French Ministry of Ecology and Sustainable Development. The objectives were to mobilise modelling tools in order to understand how the water and energy consumptions of an urban development project evolve, and also to bring into contact the stakeholders linked to urban development in order to exchange ideas with them, in the framework of workshops, about the inclusion of climate change (CC) in the design of their project.

Box 7

Project Goals

- Analyse research projects, finalised or in progress, involving French teams and dealing with the impact of CC on the urban scale: systems’ knowledge, systems’ vulnerability to CC, CC impact management, adaptation to CC impacts;
- Identify potential ideas and initiatives on the integration of information related to the adaptation of the urban built environment and its users, under the perspective of a new climatic profile;
- The built environment:
  * ... has already adapted to the local climate; the change is not an unknown issue in the world of construction, yet...;
  * the speed induced by the dynamics of climate change represents a new challenge.
- Analysis framework set up designed to identify useful information for the Adaptatio project: understanding of the concept of adaptation to the impacts of CC, degree of stakeholders’ involvement, working methods, degree of interdisciplinarity of the approaches followed, etc.

The data below recapitulate information such as the projects’ financers, the definition given of climate change, the different topics and sectors studied, the local and spatial scale, the considered methods and the results obtained.
The 24 selected projects were analysed using a table defined by the Adaptatio project team. Four categories were thus determined:

- Projects that mostly involved “the characterisation and knowledge of the systems and environments”. These projects aim to objectify the context of data linked to the environment and climate, a context that influences how we ask the question about adaptation to climate change;

- Projects that mostly involved “risk management and vulnerability”. These projects focus on specific situations and their objective is to draw up modes of action for adaptation to climate change (place, activity) with the aim of limiting damage;

- Projects that mostly focus on “the impacts of climate change”. The projects focus on the assessment of the consequences of the evolution of climatic variations linked to climate change;

- Projects that mostly involve “adaptation to climate change”. These projects notably aim to specify the concept of adaptation.

What objectives are clearly visible in all the projects? Let us take a look at each one by category.

**Characterisation and Knowledge of Systems and Environments**

- “Giving Access to French Regional Climatic Scenarios to Study their Impact and Adaptation of our Societies and Environments” (DRIAS). The objectives are climate modelling by French researchers and the presentation of the gathered information in the form of a platform dedicated to the scientific community working on adaptation. It aims to form a community that gives its support to available knowledge – accompanying scientific knowledge with a glossary;

- “Climate Local Information in the Mediterranean Region Responding to User Needs” (CLIMRUN). The main objective is to bring about scientific development through the presence of key stakeholders in tourism, energy and forestry sectors. The scale is one of buildings and heritage;

- “Climate for Culture”. The project brings together academics from the hard sciences and social sciences. It aims to bring communities closer together and make their interactions sustainable – heritage project. However, the short-term challenges identified show that it is difficult to integrate the issue of climate change, as adaptation to change is a long-term challenge;

- “Mobilisation of Interdisciplinary Knowledge and Interface between Climate Sciences, Society and Politics” (RAMONS). Analysis is anchored in the field – action approach or Ground Theory. The project has resulted in the production of communication tools such as “reflexive pauses”, which aim to build solid links between the two communities. As is the case for “Climate for Culture”, it is difficult to make the link sustainable for long-term challenges;

- “Urban Forms, Settlement Patterns and Urban Climate in the Urban Peripheries of Toulouse” (PERIURB Toulouse). This multidisciplinary and multi-scalar approach examines the links between the built environment, inhabited spaces and climate with a particular focus on the urban sector. The stakeholders are made aware of the issues. The analysis of the perception of climate change underlines the importance of large-scale action; it has also been observed that individuals place the responsibility for climate change at a higher level;
Shared Challenges for Development within ASEAN

- “The Role of Vegetation in Sustainable Urban Development – An Approach using the Challenges linked to Climatology, Hydrology and the Mastery of Energy and Environments” (VegDUD). This project sets out to contact local decision-makers who wish to work on green zones in public and private spaces;

- “Cognitive Adaptations to Climate Change” (ACOCLI). This project studies the mental representations of the climate change issue. Different population groups are created in order to assess, through semi-structured interviews, the notion of adaptation;

- AdaptTERR. The role of political decision-makers is central; the approach is purposefully less psychological or anthropological. The project demonstrates that adaptation and mitigation concern different spatial and temporal scales. Decision-makers consider that standard solutions exist, whereas for adaptation, it is necessary to identify specific solutions.

Risk Management and Vulnerability

- “Vulnerability of the Coastal Systems of a Large Mediterranean Agglomeration” (VULIGAM). This project focuses on coastal areas in terms of vulnerability and revenue – the most affected communities are taken into consideration. Reflection is notably based on local urban-planning documents in order to assess the risks of submersion; the project includes a legal dimension in order to study risk responsibility at different levels;

- “Regional Climate Change and Impacts in the Mediterranean Region” (CIRCE). This European and Mediterranean project focuses on climate change and also on socio-economic dynamics: tourism, energy, and migration. Field studies are being carried out in Athens, Beirut and Alexandria with the help of local communities (fishermen, farmers, etc.);

- “Towards Climatic Services for French Industries” (SECIF). This project focuses on the world of enterprises by raising the question of their needs with regard to climate change. The emphasis is on surveys carried out among professionals and the development of vulnerability indicators. Subsequent to SECIF, the INVULNERABLE project proposed an analysis of the impact of very cold periods on energy production – case study carried out with Veolia. The objective is to identify uncertainty – and its consequences – in the face of climatic information;

- “Vulnerability of Enterprises” (INVULNERABLE 2). This project is carried out in close collaboration with enterprises – GDF SUEZ. The project raises questions about the needs of enterprises in terms of climatic information. The exploratory dimension is less present: the emphasis is placed more on French enterprises and their way of perceiving the question of vulnerability and risk;

- ECCLAIRA. This project deals with risk management linked to vegetation and the taking into consideration of decisions at a local level. The final rendering is a guide about forms of vulnerability;
Cities and Climate Challenges

- “Urban Vulnerability during Heat Waves and Adaptation Strategies” (VURCA). How can heat waves at the urban level influence our technical and energetic comfort? There was a great deal of interest in this project and it allowed us to define indicators of severity and vulnerability during heat waves. The cost and benefits of adaptation options during heat waves are assessed.

Impacts of Climate Change

- “Living with the Risk of Landslides in Europe: Assessment, Effects of Global Change and Risk Management Strategies” (SAFELAND). This project focuses on the mechanisms and risks linked to landslides,
- “Climatisation and Urban Climate” (CLIM 2). The project’s objective is to understand how refrigeration techniques contribute to the diffusion of heat spikes in the urban environment;
- “Air Pollution and Climate Change Health Impact Assessment” (ACHIA). Air quality and its impact on health lie at the heart of this important project – see concentration of particles.

Adaptation to Climate Change

- AMICA. Development strategies are conceived according to a new climatic profile by combining short- and long-term actions at local and regional scales;
- “Vulnerability and Resilience to Climate Change in the Urban Environment” (VuReCCUrbain). This project associates the notions of mitigation, adaptation and resilience in order to give priority to conceptual links; some definitions are suggested;
- “Climate Change and Urban Green Zones: Towards an Interdisciplinary Approach” (CCTV). This interdisciplinary research studies urban and biodiversity policies by using tools from geography and sociology. The aim is to demonstrate that policies linked to biodiversity are not a side issue and that they must interact with urban policies.

What observations can be made from the analysis of the 24 selected projects?

A large majority of these projects are limited to the scale of the city; some projects are devoted to a neighbourhood scale, networks and infrastructures, and a very specific segment of a street. We have taken a look at projects in Africa, Asia and the Middle East; there are many projects on French cities. The main objective seems to be restricted to an urban scale.
Emphasis is above all placed on extremes linked to temperature and rainfall. Corporate needs have included a focus on extremes – and less on average changes. Certain studies simply envisage climate change in general, without specifying the types of risk.

- **Box 8**

  **Examples of Places and Environments**

  **Place:**
  - Africa (Egypt): CLIMATE FOR CULTURE
  - Asia (Wenchuan): SAFELAND
  - Middle East (Beirut): CIRCE
  - France (Nantes, Tours, Toulouse): ACCLIMAT, ACOCLI
  - Paris: CCTV, CCTV2

  **Environment:**
  - Island: DRIAS, CIRCE
  - Mountain: DRIAS, ACOCLI
  - Coastal: VULIGAM, ACOCLI
  - Forest: CIRCE, SAFELAND

- **Box 9**

  **Examples of Risk Studies**

- Dangers linked to extreme temperatures and rainfall: ACCLIMAT, SECIF, CIRCE
- Disturbances linked to wind: DRIAS, CIRCE, CCTV
- Reduction in snowfall: DRIAS, ACOCLI
- Rise in sea levels: VULIGAM, CIRCE
- Landslides: SAFELAND, CLIMATE FOR CULTURE
- Increase in water temperature: CIRCE, ACOCLI
- Forest fires: CLIM-RUN
- General references to climate changes: RAMONS, VuReCcUrbain
In general, the approaches used are: analysis, modelling on different spatial and temporal scales, and interviews. Few research projects use experiments; few projects take into account mitigation and adaptation jointly.

A number of projects acknowledge the importance of users – or local decision-makers – in order to arrive at common decisions with a clear division of responsibilities between the actors. In the field, adaptation remains a challenge; the link between research and implementation lies at the heart of our concerns.

Finally, we observe that adaptation is rarely defined. In the CIRCE project, participants defined it themselves; other projects did not give a definition.

[Irène Salenson]
What is the average financial amount devoted to a project?

[Hypatia Nassopoulos]
They are essentially French projects financed by the Agence Nationale de la Recherche (ANR), for example.

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<th>Projects</th>
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<td>ANR</td>
<td>VEGDUD, SECIF, MUSCADE, VURCA, ACOCLI</td>
</tr>
<tr>
<td>Europe</td>
<td>CIRCE, SAFENALD, CLIM-RUN, CLIMATE for CULTURE, AMICA</td>
</tr>
<tr>
<td>GICC</td>
<td>DRIAS, INVULNERABLE2, Adapt’ERR, ECCLAIRA</td>
</tr>
<tr>
<td>GIS Climate</td>
<td>RAMONS, CCTV, CCTV2, ACHIA</td>
</tr>
<tr>
<td>PIRVE</td>
<td>PeriUrbToulouse, VULIGAM, VuReCcUrbain</td>
</tr>
<tr>
<td>City of Paris</td>
<td>EPICEA, CLIM2</td>
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<tr>
<td>STAE Toulouse</td>
<td>ACCLIMAT</td>
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</table>

*Source: Author’s construction.*

The average funding is between EUR 500,000 and EUR 800,000, or even more for EU projects. The EU CIRCE project is an exception as it groups together around 60 partners for a total of approximately EUR 10 million.

Trainee
Adaptation is important, but is it not better to emphasise mitigation? How do the projects integrate individual behaviour?
The projects that use modelling as a method consider that human beings are “perfect” — that is to say that they “react” immediately, for example, to the adaptation options tested in a model — but it is nevertheless important to understand individual behaviour and how it influences climate change. One priority is to bring together all the stakeholders in order to build a common vision.

There is no adaptation law, strictly speaking, but only documents of a legal/judicial nature and framework documents that refer to adaptation. Among the projects analysed, some advocate the implementation of a law devoted to climate change. Adaptation does not mean forgetting mitigation: the idea of reducing emissions is present.

2.4.2. “Cities and Climate Change” in the International Debate.

The Role of City Networks

My presentation is organised around four points: the role of the Intergovernmental Panel on Climate Change (IPCC); the role of the United Nations and the Kyoto protocol; the Conference of the Parties (COP); cities in the climate negotiations.

Graph 48. A Few Figures Concerning Climate Change

- Average rise in temperatures between 1880 and 2012: +0.85°C
- 20 cm average rise in sea levels (1901-2010)
- Retreat of sea ice (4% per decade)
- Causes of greenhouse gas emissions:
By way of an introduction, some data must be retained in order to measure the phenomenon (see Graph 48).

The biggest cause of greenhouse gas emissions is the use of coal to produce electricity, for individual use but also for industry. Let us also note oil-based production and the emissions from industrial production and transport. Finally, a large part is due to deforestation and the cultivation of land for crops that releases the carbon captured by vegetation.

The IPCC was created in 1988 by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO). Its mission is to produce data about the causes and consequences of climate change. Its reports serve as a reference for international negotiations – the fifth report was published in 2014.

**Box 10**

**The Fifth IPCC Report**

- **Negative impacts of climate change:**
  - Diminution of agricultural yields;
  - Modification in the water availability and water quality (salinization, etc.);
  - Land vulnerability: extreme climatic events;
  - Land and marine ecosystems.

**Recommendation of the IPCC:** not to go beyond 2°C > reduce emissions

- Factor Four: divide emissions by four before 2050 (reduce by 40 to 70%)

**Means:** low carbon energy (neither oil nor coal, but renewable energies), energy efficiency, and circular economy.

**For cities:** low emission (collective, green) transport, densification, compact cities, and energy-efficient buildings.

Several international conventions have left their mark on our way of thinking about climate change. In 1992, in Rio de Janeiro, the UNFCCC established three major principles: uncertainty about climate change should not defer action – the precautionary principle; responsibility is shared but differentiated – industrialised countries pollute more than others, creation of international funds; the right to economic development.

The Kyoto Protocol is an international process in which countries pledge to reduce emissions in percentage terms – the protocol was published in 1997 and came into effect in 2005. The 38 most industrialised countries must reduce their greenhouse gas emissions (GHGs) by 5% between 2008-2012 – the United States, which did not communicate any numbered commitments, did not sign the Protocol. In 2013, the objectives were reached thanks to the carbon market: the most polluting countries were able to buy quotas from less polluting countries – during the same period, China and India increased their volume of greenhouse gases by 30%. The commitments in 2011 set a reduction target of 20%, but the ratification process is still underway.
Let me remind you of the negotiation process.

Graph 49. The Process of Climate Negotiations

Bali 2007 is a starting point for numbered commitments in 2012 and after. The COP15 in Copenhagen is, for its part, considered to have been a failure: no text was unanimously voted by the players present – an unsigned agreement between 26 countries was arrived at (!) The proposal to create international funds in Cancun in 2010 – Green Climate Fund and Adaptation Fund – is unique but countries are currently fixing the amounts – from 2016, developing countries should be able to apply in order to obtain funds. In 2011, in Durban, an agreement in principle marked commitment to a process of numbered reductions. For COP21 in December 2015, countries must put forward numbered commitments to be applied in 2020.

What is the role of cities in the negotiations? To their regret, cities have not signed the United Nations Convention. They wish for recognition of their role and competences to participate in climate change – they have notably been shown to be the biggest source of emissions: although the figure is still being debated by scientists, it is believed that 75% of emissions come from cities. Cities voluntarily pledge to reduce greenhouse gas emissions – let us note that these commitments are sometimes mere announcements: the city of London announced an 80% reduction before 2015.
The Mexico City Pact was signed in 2010 by 138 cities and 43 countries. The role and commitments of the cities was recognised at the Cancun Conference. The cities involved are currently arguing for their roles.

In 2014, at the United Nations Summit in New York, the Secretary-General of the UN, Ban Ki-Moon nominated Michael Bloomberg, the former mayor of New York (2002-2013), as responsible for creating ties with the cities. The Alliance of Mayors was also created on this occasion: this alliance of networks will lead to voluntary commitments and a common method in order to assess emissions – the Carbon Registry for example.

[Charlotte Raymond]

The aim of this presentation is to present the principal networks of cities working on climate and the tools being used in order to help them negotiate in the COP21 framework.

Today, many cities are working on the climate: it is in their interest to be present on the international scene and use climate as a showcase. Thus, some organisations are structured at an international level to provide methodological and financial aid to developing countries. These networks and initiatives have become competitive, they propose methodologies for the implementation of climate projects. The institutional and political challenges show that climate is a strategic issue for these networks.

Here are three particularly big networks:

- International Council for Local Environmental Initiatives (ICLEI). This is a worldwide network that groups together territories committed to climate and sustainable development issues: The United States, emerging countries, Asia; 12 mega-cities, 900 urban areas and 84 countries. ICLEI proposes both a networking of the cities and of climate-related institutes. Its mission is also to create new methodological tools for climate policies;

- The Covenant of Mayors is a European commitment network piloted by the European Commission. Its signatories pledged to lower emissions from 1990 to 2010 and to reduce, by at least 20%, carbon dioxide emissions before 2020. The member cities must establish an inventory of emissions, a plan of action for sustainable energy and an implementation report. 4055 action plans have been submitted – pilot projects are in operation in North Africa and in other countries outside Europe;

- Asian Cities Climate Change Resilience Network (ACCRN). This network is funded by the Rockefeller Foundation. The ten founding cities are located in India, Thailand, Bangladesh and Indonesia. In Việt Nam, the Institute for Social and Environmental Transition supports this project. The participating cities are Bình Định, Cần Thơ and Đà Nẵng. The United States Agency for International Development (USAID) is one of the network’s partners and has notably funded training for public decision-makers in Lào Cai and Huế.
Table 34 indicates some examples of financial partnerships.

**Table 34. Examples of Financing Proposed by Donors for Adaptation to Climate Change Projects**

<table>
<thead>
<tr>
<th>100 Resilient Cities</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Working on urban adaptation</td>
</tr>
<tr>
<td>- Financed by the Rockefeller Foundation (ACCCRN)</td>
</tr>
<tr>
<td>- Beneficiaries: local authorities</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Urban Climate Change Resilience Trust Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Working on urban adaptation</td>
</tr>
<tr>
<td>- Financed by the ADB / DFID / Rockefeller Foundation</td>
</tr>
<tr>
<td>- Beneficiaries: local authorities</td>
</tr>
<tr>
<td>- USD 140 million available</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Adapt-Asia Pacific Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Working on adaptation</td>
</tr>
<tr>
<td>- Financed by the USAID</td>
</tr>
<tr>
<td>- Beneficiaries: national and local governments</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADB Climate Change Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Working on adaptation</td>
</tr>
<tr>
<td>- Financed by the ADB</td>
</tr>
<tr>
<td>- Beneficiaries: public and private counterparts</td>
</tr>
<tr>
<td>- USD 50 million (USD 14 million dedicated to adaptation)</td>
</tr>
</tbody>
</table>

*Source: Author’s construction.*

The financing of these networks is assigned to adaptation. In Asia, there is a high level of vulnerability, so emphasis is placed on adaptation and how to resolve inadaptability.

France is one of the few countries in the world to have implemented methodological tools to fight against warming at the level of local communities. Local community climate plans are obligatory when there are more than 50,000 inhabitants; 465 climate plans have been developed. These methodologies are used in the form of pilot plans in other parts of the world – South Africa for example.
Mexico, South Africa, India, China, Brazil and Argentina are emerging countries that account for 37% of global emissions. 365 network initiatives have been identified. International effort is thus focused on a few countries that capitalise more than others on the available financing and technical support. This reality is also proof of the strategic challenges and policies that lie behind international climate aid: it also helps certain national and international players to adopt a better standpoint with regard to politically influential countries with rapidly expanding economies.

By way of a conclusion, I would like to show you some results of a large survey carried out in preparation for the COP21, organised in June 2015 entitled “The planetary citizen debate”.

This unprecedented project is part of the United Nations Framework Convention on Climate Change. It was organised by the Danish Board of Technology Foundation (DBT), the National Commission for Public Debate (CNDP) and Public Missions; 10,400 citizens participated in 104 debates on five continents and 15 islands. The result is a real-time photograph of the global awareness about environmental issues.

**Graph 50. Stakeholders’ Commitments in the Preparation of COP21 (1)**

<table>
<thead>
<tr>
<th>Which of the following options should a Paris agreement include to address loss and damage associated with the impacts of climate change?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) A global fund should be established that should be pay for such damages</td>
</tr>
<tr>
<td>(2) We should help countries implement plans to reduce such damages</td>
</tr>
<tr>
<td>(3) We should create new institutional arrangements, such as an international climate court to settle damage claims</td>
</tr>
<tr>
<td>(4) Countries should take private insurance coverage</td>
</tr>
<tr>
<td>(5) Private insurance should play that role, and it should be left to anyone (individual, corporation, public body) to be insured or not</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Should a Paris agreement include a global long-term goal for zero emissions at the end of this century?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Yes, it should be legally binding for all countries</td>
</tr>
<tr>
<td>(2) Yes, but it should be only legally binding for developed and emerging nations</td>
</tr>
<tr>
<td>(3) Yes, but it should be voluntary for all nations</td>
</tr>
<tr>
<td>(4) No</td>
</tr>
<tr>
<td>(5) Don’t know / Do not wish to answer</td>
</tr>
</tbody>
</table>

*Source: [http://climateandenergy.wwviews.org](http://climateandenergy.wwviews.org)*
Day 2, Tuesday 21st July

2.4.3. The Adaptatio Research Project

Adaptatio is a research project financed by the French Ministry of Ecology and Sustainable Development. Its aim is to propose an innovative methodology for climate change and urban development; analysis is based on two key resources: water and energy.

[Hypatia Nassopoulous]

How can we integrate the issue of adaptation on the scale of neighbourhood urban development? The Adaptatio project notably focuses on the understanding of the effects of climate change on a real situation – the study considers that the selected neighbourhood remains unchanged over a 50-year period in order to show the project’s key stakeholders how the neighbourhood, which they themselves have defined, may be affected by a modified climate. One of the central issues is to thus assess the physical and economic vulnerability of the neighbourhood; two types of model are used for the assessment of physical vulnerability: the first on the scale of buildings to calculate energy consumption; the second on the neighbourhood scale to estimate water and comfort heating consumption.
The urban environment is complex. According to a preceding IPCC report, the increase in temperature over the 1980-1990 and 2080-2099 periods could be from 1 to 6.5 degrees.

**Graph 52. Urban Heat Islands**

Heat islands have large effects at the urban level. There is a strong link between climate, population and the built environment: this entails building in function of the climatic profile in order to obtain the optimal conditions for the inhabitant – bioclimatic aspects. In the field, the development of urban activities leads to a modification of the environment: increase in temperatures, a rise in air turbulence, decrease in the number of days of extreme rainfall, etc. – see 2003 heat waves in France. According to the International Energy Agency, cities are responsible for 67% of greenhouse gases.

In this situation, there are two possible types of response: adaptation and mitigation. Until now, we have concentrated our efforts on mitigation.

Mitigation aims to reduce emissions, adaptation to reduce impacts. They are complementary responses at different levels and in different domains: waste management, urban planning, transport, renewable energies, building materials, etc. However, the general observation remains the following: infrastructures have long lifespans and the replacement rate of buildings remains low. Rising to the challenge of adaptation implies, however, great anticipation: infrastructure that we build for the next 50 years should already be integrating the adaptation dimension. In reality, there are not many tools at hand, and those we have cater more to the needs of comfort.

The *Adaptatio* project aims to address these concerns. Integration must also have an "operational dimension" by including in our observation the stakeholders/practitioners of the project: the project
Shared Challenges for Development within ASEAN

leaders, the engineers, the technicians, etc. The challenge is to bring together a wide range of competences in order to adopt a complex approach to the issue.

**Diagram 28. Urban Socio-ecosystems and Environmental Changes: The Case of the Adaptatio Project**

<table>
<thead>
<tr>
<th>Human drivers</th>
<th>Environmental changes</th>
<th>Cross scale influences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional</td>
<td>Human, social and economic activities</td>
<td>Altered biogeochemical cycles (BGC): greenhouse gases (GHGs) Climate change</td>
</tr>
<tr>
<td></td>
<td>Production and consumption</td>
<td></td>
</tr>
<tr>
<td>Local</td>
<td>Land use and cover change (resource extraction, agriculture)</td>
<td>Altered BGC cycles: pollutant transport, GHGs Climate change: regional Altered hydrosystems: large water projects Biodiversity: Regional species pools</td>
</tr>
<tr>
<td></td>
<td>Land use and cover change (urbanization)</td>
<td>Altered BGC cycles Climate change: Urban heat island Altered hydrosystems Biodiversity</td>
</tr>
</tbody>
</table>

Source: Grimm et al. 2008.

A new innovative methodology:
- Allows key stakeholders to integrate into the design of their projects the question of adaptation to climatic change and assess different scenarios: energy and water consumption, comfort as well as the economic vulnerability that results from it;
- Examines adaptation solutions in order to reduce the physical vulnerability of neighbourhoods as well as economic vulnerability;
- Creates conditions of exchange between researchers and the stakeholders/practitioners of the development project. Do we need an “intermediary” to establish links between the world of research and the operational one – see the emergence of a new profession: designer?

The first stage of the study entails gathering information from the field for the study of the selected case (urban planning project scale) and making a bibliographical situational analysis at the beginning of the project on issues linked to climate change adaptation, cities, tools, etc. A review of existing literature shows that there is no single definition of adaptation to climate change.
Several key words can be identified in the definitions of adaptation to climate change: for the United Nations, we have to face up to climate change; for the EU, we have to reduce emissions to control its effects. For the French State, adaptation also consists of reducing vulnerability to climate change – see territorial climate energy plans.

The city of Paris climate plan dates back to 2007 and 2012, and that of the city of Nice, in the south of France, to 2013. These three plans are mentioned as examples of climate plans. In terms of flooding, flood management plans are mentioned; a reference system is proposed in order to be able to recognise all individuals exposed to the risk of heat waves and particular attention is paid to comfort and the role of vegetation and water. Particular attention is paid to the protection of local flora and fauna. Finally, the three climate plans highlight the importance of the transfer of knowledge to citizens at risk. However, although communities are aware of issues surrounding the identification and evolution of risks, very little has been put in place to manage these risks.

**Stéphane Lagrée**

If we come back to the definition of climate change according to the EU and the United Nations, for example, how can we envisage the dialogues that will take place at the COP21 in Paris next December?
[Hypatia Nassopoulos]
It is a question of governance. In order to act at a local level, the message must also be clear at the higher level. The COP21 may contribute to the dialogue. “Adaptation” and “mitigation” have to be discussed.

Roland Mindene Mbella
Man plays an essential role in the chain. How is the ecological conscience of people constructed de facto? Furthermore, what is the link between physical and economic vulnerability?

[Hypatia Nassopoulos]
It is important to work on the citizen’s conscience aspect – bottom-up approaches. Consumers’ or citizens’ associations can play an intermediary role. At a given moment, it is essential to announce the economic cost of vulnerability – numbered examples in the case studies.

[Irène Salenson]
Some types of actions at a citizen level can be identified:
- Regulatory models – which may be coercive or incentive. The case of prohibiting cars from driving through Paris in the event of severe pollution;
- Tax help or reductions if citizens improve their houses to make them better adapted to climate change – solar panels;
- Government and community awareness campaigns: posters about waste disposal, subsidised documentaries on television, etc.;
- Integration of the issue in school curricula.

[Charlotte Raymond]
There is an integrated project in the school curriculum in Đà Nẵng. A pilot project was launched in a district of the city, teachers were mobilised and benefitted from training about climate in their respective subjects – for primary school, geography, natural sciences and sciences; for secondary school, biology, geography and civic education.

[Hypatia Nassopoulos]
For our Tolbiac Chevaleret case study, the choice of site was made after a series of interviews with people responsible for other urban development projects – the project leaders with a technician/practitioner profile generally considered that climate change belongs to the domain of local responsibility, however, the examples of the actions that have been mentioned often focus on mitigation.
The big technical challenge of the neighbourhood was the presence of a railway. The solution was to cover the rails with a slab of concrete and build on the slab. In an original way, the buildings were constructed both on the slab and on the soil.

The two main objectives of the project were to create a mixed neighbourhood – housing, shops, cultural activities, etc. – and the inclusion of vegetation – walkways. Several stakeholders were involved in the project such as the city of Paris, managers, the coordinating architect and specialists in environmental studies.

In France certifications are granted in function of the type of building (certificates for housing, offices) and in function of the building’s performance. These certificates testify, among other things, to acceptable energy consumption and a certain level of comfort – examples of this include the Bâtiment Basse Consommation (BBC) the Habitat and Environment certificate.

Through our analysis, for this neighbourhood that is under construction, climatic information from the past is taken into account in the project’s design. The major risk is that of flooding and its prevention. Another important issue concerns geological risks. A last element was the presence of different networks – water and drinking water networks, techniques applied to save water resources.

In order to model adaptation on the neighbourhood and building scale, it was necessary to: make a physical representation of the neighbourhood, study its physical changes, envisage the changes in the neighbourhood in another climate, determine how the neighbourhood functions and assess costs – for this last aspect, the study used the cost/efficiency method: calculation of costs in function of a fixed objective of temperature comfort; investment for the adaption solution: energy and water bills.

Finally, in the framework of the reflections carried out by the consortium about the possible necessity of a (designer) intermediary, the people-centred approach, called Design Thinking has been presented. This approach considers the technological possibilities and financial constraints; all the stakeholders are consulted. According to Brown (2010), three stages are distinguished: the necessity of understanding needs; a creation and innovation phase; real time applications and tests.

The workshop was divided into two groups each working on Paris case studies: Boucicault in the 15th district; Clichy-Batignolles in the 17th district. The framework documents and the main technical characteristics were provided: historical background; size of operation; presence of biodiversity; programming objectives; conservation of national heritage and social and environmental objectives. The details of each project gave the trainees information linked to the sites, their development, waste management, mobility, considered risks, financing arrangements, labels and the management of energy and water aspects. The illustrations allowed the trainees to visually examine the two studies and bibliographical references refer them to Internet sites.

Each group had to analyse the data from an adaptation to climate change angle by notably using the Adapatio project as an example. Feedback was expected.
Day 3, Wednesday 22nd July

2.4.4. How do we Finance the “Climate” Projects of Cities and Territories? The Challenges, Methods and Tools of a Donor

[Clémence Vidal de la Blache]

How does AFD set up, finance and monitor its climate and city projects?

We can note a large increase in the number of projects that are financed by AFD and present climate co-benefits. The total amount of commitment is near to EUR 3 billion (2014); urban projects thus represent about 50% of AFD climate financing. However, the estimations of cities concerning financing needs are in the region of EUR 1,000 billion over the next 20 years: needs go largely beyond the financing capacities of institutional donors.

The agency intervenes at the same time on mitigation issues – encouraging lower emission development trajectories – and adaptation – reducing the vulnerability of its partners in order to face up to the already witnessed effects of climate change. The common theme of reflection is that if climate changes are not taken into account, then development cannot be sustainable.

Development players are aware that public funding will never be enough, we thus increasingly talk about “transformational” goals (one of the big criteria of the new Green Climate Fund for example): climate funding must be innovative, in order to accompany the transformation of developing economies and urban production methods towards more resilient paths that are more carbon-efficient. They must also seek to have a demonstrative or “catalytic” effect, that is to say encourage the mobilisation of supplementary resources, notably from the private sector.

A dialogue began between the workshop’s trainers about issues of urban resilience and the characteristics of a “city climate” project – the trainees were notably asked to give a classification of the types of urban project in function of their impacts (priority given to adaptation or mitigation). This exercise allowed us to have a methodological overview of the first two days of exchanges.
How can we characterise the agency's projects concerning "Cities and climate" issues?

- There are big financial commitments: AFD has funded more than a hundred urban projects with climate co-benefits in more than 70 urban territories since 2005;

- More than EUR 4 billion was committed between 2010 and 2014, of which 20% for adaptation – integration of water resources and prevention of extreme climatic events: dykes, evacuation, and early prevention;

- Urban issues are essential levers that are increasingly important: 35% of climate commitments over this period (and even 50% in 2014);

- Three main sectors of intervention: urban mobility, energy development and efficiency.

In the framework of AFD’s "sustainable cities” strategy (2014-2016), and in relation to the climate strategy adopted in 2012, the working goals of a donor like AFD can be divided into three major axes:

- Accompanying the climate commitments of cities with adapted funding and support – more than 70 communities financed since 2005; development of partnerships and studies to feed into reflection about innovative climate funding adapted to the needs of cities;

- Convincing cities to act in favour of carbon efficiency – boost advocacy for the climate aspect of urban policies; encourage and accompany local public policies that reconcile social and climatic challenges;
- Bringing cities and innovative expertise closer together – mobilisation of French know-how in the domain of sustainable development: partnerships with the Agence de l’Environnement et de la Maîtrise de l’Énergie (ADEME), the Fédération Nationale des Agences d’Urbanisme (FNAU), the Agence Nationale pour la Rénovation Urbaine (ANRU), decentralised cooperation and private expertise; support for international initiatives (networks of cities, Alliance) aiming to bring together the offer and demand of financing.

We have summarised below the financial tools and illustrated our points with some examples (see Graph 53 & Table 35).

We can also note a wide range of projects and financial tools, with the aim of adapting to each institutional context. An AFD intervention in favour of an urban project with climate co-benefits may also directly concern local stakeholders (community, public establishment), the State, municipal funds, and banks and specialised financial institutions. The case studies presented aim to illustrate the diversity of this “range of interventions” (see Diagram 30).

**Graph 53. Financial Tools and Types of Intervention**

- A wide range of financial tools resulting in the commitment of EUR 18bn since 2007:
  - Grants (3%);
  - Sovereign loans (68%);
  - “Non-sovereign” loans (29%).
- Three major families of intervention:
  - Mitigation: “A mitigation project is a development project that reduces greenhouse gas (GHG) emissions during its lifetime compared with a baseline without a project.”
  - Adaptation: “An adaptation project is a development project that reduces the vulnerability of goods, people or ecosystems to climate risk.”
    Support for national and territorial climate policies and action plans via budget support and/or technical assistance.

*Source: Author’s construction.*
Table 35. Toolkit: What Institutional Set ups?

1. Direct financing of local stakeholders, with or without State guarantees:
   - Local climate budget loans
   - Investment programmes/projects with an impact on climate

2. Financing of local or regional financial intermediaries

3. Support for the emergence of local resilient and low-carbon strategies via the State

Examples of projects

- Johannesburg, state of Minas Gerais in Brazil, Department of Antioquia in Colombia
- La Barquitaín St Domingo, Medellin, State of Rio, Durban in South Africa, Bus Rapid Transit (BRT) Addis Ababa, Zenata in Morocco, Toledo in Brazil
- Corporación Andina de Fomento (CAF), BDMG (Minas Gerais development bank), Denizbank, infrastructure fund in Việt Nam
- Philippines, secondary cities in Cameroon, Lomé in Togo

Source: Author’s construction.

Diagram 30. Which Associated Financial Tool?

Source: Author’s construction.
The first example of a project is in Johannesburg, the economic capital of South Africa.

**Map 28. Case of Johannesburg**

- Johannesburg: transform the city to address problems of social inequality and urban sprawl
  - Densification of urban nodes along the transport corridors and re-generation of the city centre: integration of poorer populations, functional mixing
  - Reduction of the carbon footprint and reconciliation of social and climatic objectives

- Two components:
  - Investments: access to services and amenities in the city centre and along the corridors
  - Technical cooperation with Paris and Lille on spatial planning, to integrate better climate challenges

- Institutional criterion: successful local development strategy, politically backed
- Transformational? Urban and climate morphology
- Financial criterion: non-sovereign and budget approach because of the degree of municipal risk

*Source: Author’s construction.*
The challenges to be met in South Africa are closer to those of Southeast Asia than those of Africa. The big social divide (one of the biggest in the world) is apparent in the spatial development and geography of South-African cities; they are the result of the country’s history and its apartheid regime.

In South Africa, urban growth is still strong, notably due to rural migration – but also because of international migrations: Johannesburg groups together a large number of migrants from throughout the region (Zimbabwe, Somalia, Congo, Nigeria). This has notably led to a rise in xenophobia with several anti-foreigner riots in Johannesburg in recent years.

Poorer neighbourhoods are concentrated on the city’s outskirts – Soweto is located for example at 60 km from the Central Business District (CBD) – but also in the city centre that deteriorated and was abandoned and “emptied” at the end of apartheid. The city is thus confronted by extensive urban sprawl phenomena. This has social consequences (time spent commuting and the high costs associated with it, notably for the poorer households) and climatic ones (greenhouse gas emissions linked to the dominance of motorised journeys). What is more, the city is vulnerable to flooding and above all to major water stress – it is the biggest city in the world that is not located near a lake or the coast.

One of the goals of the City of Johannesburg’s project, funded by AFD, is the integration of poorer neighbourhoods into the urban fabric. This also entails investing massively in public transport to open up these neighbourhoods (BRT network), while at the same time investing in social housing, neighbourhood amenities, improvement of and access to water and electricity in urban nodes along the transport corridor. In the long term, the project aims to transform the morphology of the city to make it more compact and limit movement.

In parallel with the budget loan that finances the investment, AFD has implemented a technical cooperation programme with several activities: finalising of the climate energy plan and support for its operationalisation, training of city teams for the monitoring of the impacts of the climate strategy and the inclusion of climate issues in planning documents.
In Cameroon, AFD worked with the Ministry of Urban Development to support three secondary cities, with the aim of strengthening the urban framework and creating regional poles: cities of Bertoua, Bafoussam and Garoua.

Map 29. Case of Cameroun

- Financing of the priority investment programmes of three regional capitals: Bertoua, Bafoussam, Garoua
- Intervention only in existing neighbourhoods with the aim of fighting urban sprawl (mitigation)
- Installation of solar street lamps in the isolated neighbourhoods of three cities (mitigation)
- Construction/renovation of drains in Garoua leading to the reduction in the vulnerability of inhabitants to the risk of flooding (adaptation)
- Preservation of city green spaces

- Institutional criterion: “programme” approach at a national level
- No climate strategy, but inclusion of these challenges in the programming and conception of priority investments

Source: Author’s construction.

The secondary cities pose particular and common challenges, notably the isolation of neighbourhoods and a lack of urban amenities. Climate is not the first goal of the project. Emphasis is placed on public road services, public spaces and neighbourhood amenities and urban services.

This case study demonstrates that we can, however, include climate issues in all urban investments: creation of drains to facilitate the evacuation of rainwater and avoid the recurrent flooding of urban zones, priority given to solar energy for street lighting. In parallel, the idea is to begin working on planning tools in order to allow cities to control their growth and make the populations aware of the risks the territories face.
The Philippines is a country that is particularly vulnerable to natural and climatic risks, and this vulnerability is increasing because of climate change: frequency and/or change of the path of typhoons, rise in sea levels, acidification of oceans with an impact on fishing.

The government has made adaptation to climate change one of its five priorities; the climate policy – revised in 2010 – is considered to be one of the most successful regulatory frameworks at an international level. Since this reform, significant competences in the domain of the management and prevention of risks, including climatic ones, have been transferred to local communities (urban planning, prevention, evacuation management and first aid, etc.).

AFD financed a technical assistance project in 2013 to work on three cities, one of which was General Santos City. This entails helping municipal authorities to apply the law, which obliges them to include climatic and prevention of natural risk issues in their planning documents. The last intervention dates back to 2015: funds were mobilised from the European Union Asia Facility to strengthen a certification implemented by the government – cities respecting their obligations.
Finally, the last intervention consists of a budget loan to support the national policy for the management and prevention of risks, notably at a local level.

Finally, one last example, the Andean Development Corporation – *Corporacion Andina de Fomento* (CAF) – brings together the most urbanised regions in the world. The challenges are big because of urban sprawl and the overexploitation of resources. The CAF is a regional development bank and the leader in financing infrastructures in Latin America. It recently committed itself to an initiative to formalise its urban strategy and strengthen its climate approach and tools. AFD is providing it with long-term resources to finance urban projects with climate co-benefits in the region, and is accompanying it *via* a CAF technical cooperation programme – and its borrowers – on climate issues: support in the development and implementation of climate strategies; structuring of resilient and low-carbon projects; definition of local public policies in sectors that have an impact on the climate (waste, transport, housing/habitat etc.).

**Photo 2. Case of the Andean Development Corporation**

- **CAF**: regional development bank, strategic partner of AFD in Latin America
- **Bringing up to standard of urban strategy** (“city of the future” programme) and implementation of climate tools and diligence (carbon balance, vulnerability diligence, etc.)
- **Credit line to finance 3-4 urban investment projects “classified” climate** *via* eligibility criteria negotiated with AFD
- A technical cooperation programme:
  - Support to the CAF on climate issues (methodological developments) and integrated urban development
  - Technical support to municipalities regarding: (i) the development and implementation of climate strategies (territory carbon balance, climate strategy definition and action plans, CC vulnerability diagnostics and inclusion in the planning process), (ii) support for the definition and implementation of resilient and low-carbon public policies and projects (waste policies, transport, pre-feasibility studies, energy audits, etc.)
- **Institutional criteria**: added value of a financial and strategic partnership for AFD
- “Bank” financing adapted to a regulatory context limiting access of communities to loans/donor loans

*Source: Author’s construction.*
Day 4, Thursday 23rd July

This fourth day of training was devoted to the study of territorial climate strategies. The practical cases developed allowed the trainees, who were divided into work groups, to reflect on the different stages of development and implementation of a local public climate policy, as well as the factors and stakes to be considered for its efficiency.

The first case study was presented by Charlotte Raymond. It concerned Minas Gerais, one of the federal States in Brazil, located to the north of the country’s South-East Region – its population is about 20 million inhabitants for a surface area of nearly half more than that of Việt Nam. The economic data and the energy, climate and vulnerability profile of Minas Gerais were transmitted to the trainees three weeks prior to the training (see work document “a climate energy plan for Minas Gerais in Brazil. Practical case study”). The aim was to exchange ideas about the planning stages concerning climate change – How can a community organise its territory and integrate climate issues into its sectoral policies (transport or energy production)? The trainees had to place themselves in the position of an individual technically responsible for the State of Minas Gerais and follow the preparatory stages for the governance of the climate plan by carrying out a diagnostic of the territory’s situation in terms of energy and vulnerability, and by proposing an action plan via an exchange process with the stakeholders.

The second presentation was made by representatives of the city of Đà Nẵng – Đà Nẵng Climate Change Coordination Office (Đà Nẵng CCOO) concerning the good practices implemented in the community in terms of climate strategy: composition and way of functioning of the pioneering body; local planning actions; coordination with donors and the urban fund of the department for the development of investment funds (DDF). The interventions also showed the limits of Đà Nẵng’s climate policy and the improvement axes to overcome these limits. The presentations of the CCOO led to a question and answer session with the audience.

Day 5, Friday 24th July

This last day, which was facilitated by Clémence Vidal de la Blache, was also devoted to practical exercises concerning the setting up of a project to illustrate the challenges, methods and tools that aim to improve the inclusion of climate issues in urban strategies and projects. This entailed mobilising the knowledge acquired during the week for a study of the city of General Santos located on Mindanao Island in the Philippines.

The work groups had to reason like members of the city’s planning service. The imagined scenario was to present to the new mayor of General Santos, who is elected on a pro-business platform in the near future, the main challenges of the territory, by linking urban dynamics and climatic issues. The challenge was to convince the new mayor to pursue, and improve, the project, concerning the prevention of climate-related risks, which was begun by the preceding municipal team.
After a presentation of the institutional and regulatory framework in the Philippines, the groups were invited to work on a first diagnostic-type analysis. Four work groups were constituted in function of four topics: urban diagnostic; vulnerability and adaptation study; carbon balance; institutional diagnostic.

The second exercise assumed that, six months later, the new municipal strategic document included climatic issues and had allowed them to identify a list of priority actions, which covered municipal investments, as well as institution strengthening actions. Using this priority programming, the groups were led to identify and defend an urban project with climate co-benefits.

A search grid was proposed in function of the two following axes:

- Objectives and importance for the city: Why should this project be a priority for the mayor (What are the criteria for choice)? What development challenges do they meet? Which climate challenges do they contribute to (co-benefit)?

- Critical route for the project’s preparation: What institutional set up should be proposed for the preparation/implementation of the project; Which other stakeholders should be consulted? How can the climate risks be integrated – location of infrastructures, construction standards, choice of materials, “soft” accompanying actions? What are the main difficulties we can anticipate: technical, financial, social, environmental, available data? What institutional measures need to be adopted – urban/sectoral planning, political/regulatory decisions, awareness campaigns/education? Which partners need to be mobilised to accompany the city in its preparations, financing and implementation?

The day was wound up with the construction of a final summary of the week that was submitted, the following morning, during the feedback in the plenary session.
Reading Texts and Work Documents


Raymond, C. (2015), Danang case study, internal report in the context of the study « Les conditions de mise en œuvre et de réalisation des projets urbains et territoriaux à objectif « climat » en France et dans les pays en développement » on behalf of AFD.


Selected Bibliography


Websites
http://climateandenergy.wwviews.org
http://www.espere.net
## List of trainees

<table>
<thead>
<tr>
<th>Surname and first name</th>
<th>Institution</th>
<th>Field/discipline</th>
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### Shared Challenges for Development within ASEAN

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Biographies of Speakers
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TITLES AND DIPLOMAS
2001: Ph.D. in international logistics, University of Wales, Cardiff School of Management (Cardiff Business School), award for the best Ph.D. thesis in logistics from the United Kingdom Chartered Institute of Logistics and Transport (CILT).

PRESENT PROFESSIONAL POSTING
Head of the International Affairs Department, logistics and transport at the management faculty of the University of Thammasat, Thailand.

CURRENT MISSIONS AND RESEARCH WORK
My research is principally centred on multimodal transport, international logistics, logistics development policy and performance measures for the supply chain. I have published more than eighty articles and reports in specialised journals such as the *Journal international de distribution physique et de gestion logistique*, the *Journal international de recherche et d'application logistique*, the *Asie-Pacifique Journal du Marketing et de la logistique*, the *Journal of Applied Sciences*. I have co-written twelve books.
Marc CHOISY

Email: marc.choisy@ird.fr

TITLES AND DIPLOMAS

2004: Ph.D. in integrative Biology, University of Montpellier, congratulations from the jury.

PRESENT PROFESSIONAL POSTING

Research Fellow at the IRD since 2007. Research programme into the spatial dynamics of dengue in Southeast Asia and its consequences for efficient control, carried out in partnership with the University of Pittsburgh, Oxford University and Hanoi Pasteur Institute (NIHE).

CURRENT MISSIONS AND RESEARCH WORK

I am interested in the evolution of infectious diseases. My work consists in applying concepts and methods from ecological sciences and evolution to the study of infectious diseases. My approach carries a large theoretical component and calls upon mathematical, computer and statistical modelling. Since being recruited by the IRD, I have taken a particular interest in developing models by basing myself as much as possible on real data. This allows me to make quite high-quality quantitative predictions. Among the issues that particularly interest me figure:

- The study of the seasonality of infectious diseases. Understanding their seasonality is important in terms of predicting and anticipating epidemics. Demographic (particularly birth-rate) and climatic factors have a great influence on seasonality;

- The spatial dynamic of infectious diseases. Human populations are relatively well structured in space and diseases move around within these populations. I seek to understand how these diseases move around and identify the factors that control these movements. One of the principal results of the dynamics of metapopulations is that spatial dynamics may largely influence global persistence. The idea is to find efficient control policies that explicitly take into account spatial dynamics;

- Interactions between infectious diseases. Human populations are collectively affected by several diseases that engender either synchronous or successive epidemics. The idea is to explore whether the diseases can interact with each other and identify the mechanisms that may either be immunological or behavioural (e.g. convalescence, quarantine, school calendar etc.), or environmental (e.g. climatic). Understanding these interactions between infectious diseases is important from a control point of view: we wish to ensure, for example, that a control against a disease A does not favour a disease B.

My research work uses human infectious diseases to explore general fundamental questions in ecology. Thanks to the abundance of available data, infectious human diseases are a good biological model. Furthermore, the results of my work all have concrete applications in epidemiology.
Shared Challenges for Development within ASEAN

Alexis DROUGOUL

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TITLES AND DIPLOMAS
2000: Accreditation to supervise research work, Computer Sciences, University of Paris 6.

PRESENT PROFESSIONAL POSTING
Research Director since December 2004 at the IRD, Associate Researcher (since 2012) at the University of Cần Thơ (Việt Nam); Professor of Computer Science (2000-2004) at the University of Paris 6, LIP6 Laboratory; Computer science Lecturer (1995-2000) at the University of Paris 6, LAFORIA & LIP6 laboratories.

CURRENT MISSIONS AND RESEARCH WORK
My general research work issue concerns the conception of tools of artificial intelligence to help with the modelling and simulation of complex systems, with a great desire to facilitate interdisciplinary work and extract multi-domain, cross-cutting concepts. On these grounds, I was already participating in 1991 in defining certain basic concepts of "agent-based modelling", and at the same time working in parallel on numerous thematic applications (in ethnology, hydrology, geography, road traffic, to mention but a few). From 1998, at the crossroads of the domains of computer science, experimental economy and participative conception, I worked more specifically on participative simulation and modelling methods, which allow us to involve social players in the conception of models which proved to be particularly adapted to the management of conflicts concerning the users of shared resources. They have been successfully applied in the field (Bhutan, Viêt Nam, Thailand and Mexico). In 2005, I became the designer and one of the principal architects of the modelling and simulation platform GAMA (http://gama-platform.googlecode.com), which, to recapitulate 15 years of research in the domain, aims to put at the disposition of non-computer scientists tools of conception for spatially explicit, multi-scale and multi-formalism models, as well as allow an “intelligent” exploitation (by simulation and optimisation) of the thematic project in which I have been participating for more than six years now, first in Hà Nội then at the University of Cần Thơ, involve decision support in the policy of fighting against environmental disaster (the rise and salinisation of Mekong water, biological invasion, avian flu epidemiology, urban disaster).
Biographies of Speakers

Nathalie FAU

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TITLES AND DIPLOMAS
2003: Ph.D. in Geography, University Paris X-Nanterre, very honourable distinction with the unanimous congratulations of the jury.
1996: Unilingual language and oriental civilisation diploma (Dulco) in Indonesian at the Institut national des langues et civilisations orientales (Inalco).
1994: Agrégation in Geography.

PRESENT PROFESSIONAL POSTING
Lecturer at the University Paris 7-Denis Diderot since 2004.
Member of the Centre d'Etudes en Sciences Sociales sur les Mondes Africains, Américains et Asiatiques – CESSMA laboratory –, a mixed research unit (UMR 245) created in 2014 and controlled by three institutions: University Paris Diderot, Inalco, IRD.
Guest researcher at the CNRS, the Institut de Recherche sur l’Asie du Sud-Est Contemporaine (IRASEC), USR 3142 - UMIFRE 22 CNRS MAEE, Bangkok, based in Kuala Lumpur, Malaysia between 2011 and 2014. Associated researcher since 2014.
Guest researcher at the Maritime Institute of Malaysia (MIMA), Kuala Lumpur.

CURRENT MISSIONS AND RESEARCH WORK
All my research concentrates on three big areas of research.
- "New urban central areas in Southeast Asia" studies the essentially urban spaces built through globalisation: world cities such as Singapore and also cities on the fringes of metropolisation such as Penang or Johor Barhu in Malaysia.
- "Cross border and transnational spaces in Southeast Asia" studies the link between cross-border and transnational spaces using the Malacca Straits. The Malacca Straits are divided into two areas of cross-border cooperation, commonly referred to by the neologism of “growth triangle”. These studies into cross border spaces have gradually brought me to see the Malacca Straits as a transnational area. When we go from a cross-border space to a transnational one there is a change in the scale of spatial organisation. This research was subsequently extended in the framework of the Agence National pour le Recherche (ANR) “Transnational dynamics and territorial restructuring in southern countries” (Transiter) that compares the economic corridors of the Greater Mekong region with those implemented in the Malacca Straits region in order to study the interactions between transnational dynamics and territorial restructurings.
research that followed, I took an interest in the questions of connectivity and the construction of infrastructures in Southeast Asia.

- “The role of maritime spaces in regional integration in Southeast Asia” aims to analyse the processes of spatial integration using maritime spaces – a little used approach in the study of large regional areas – and envisages the seas of Southeast Asia not through a conflict approach, but through one of regional cooperation: programmes of military cooperation, of the diplomatic policy of multilateral defence and maritime security (Regional cooperation and port development axis); the structuring role of ports that constitute hubs of maritime integration and also inter-modalism or even Barter Trade and Ro-Ro networks (Regional cooperation and port development axis); cooperation to protect the maritime and coastal environment in Southeast Asia with the multiplication of protected maritime areas and multilateral, sub-regional and bilateral projects within ASEAN (Regional cooperation and the maritime environment axis); implementation of the common management of disputed spaces in order to go beyond conflicts and commonly exploit natural resources (Regional cooperation and the management of natural resources axis).
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TITLES AND DIPLOMAS
2008: Doctorate thesis in artificial intelligence, University of Toulouse.

PRESENT PROFESSIONAL POSTING
In 2010, after completing two post-doctorate years at the Institut de la Francophonie pour l’Informatique (IFI) in Hà Nội, I took a post as lecturer in the computer science faculty at the University of Toulouse 1, Capitole.

I am carrying out my research within the Institut de Recherche en Informatique de Toulouse (IRIT) in the Systèmes Multi-Agents Coopératifs (SMAC) team.

CURRENT MISSIONS AND RESEARCH WORK
Generally speaking, my research work concerns the formal or non-formal in human cognition and decision-making (particularly confidence and emotions) and the integration of these models within multi-agent simulations.

This research is currently part of two research projects:

- The MAELIA project (Multi-Agent for Environnemental Norms Impact Assesment) supported by the RTRA STAE. The MAELIA project consist in modelling the socio-environmental impacts of the governance and management norms of renewable natural resources and the environment. It aims at developing a modelling and simulation platform of the direct/indirect and expected/unexpected impacts of norms on a territory whose resources are both subject to concurrent exploitation and dependent on physic-bio-geochemical variations. The preferred domain of application is water management in the Adour-Garonne basin;

- The ANR Emotes project (Emotion in Social Interaction: theory, experiences, logical and computerised studies). The aim of the Emotes project is to study the so-called strategic emotions, such as guilt, remorse, envy, anger, and moral satisfaction which may arise in a strategic interaction context (that is to say, when the utility of an agent’s choice also depends on what other agents are going to decide to do) under the triple point of view of psychological theories, logical formalisation and simulation. The aim is to integrate strategic emotions into the behaviour of agents on the Soc Lab (simulation platform of organisations based on the formalisation of C. Sibertin-Blanc and P. Roggero of Sociologie de l’Action Organisee) platform.

I am also involved in several other thematic networks supported by the National Network of Complex Systems, whose networks are SimTools-Network, MAPS (Multi-Agent modelling applied to Spatial Phenomena) and METISSE (Methods and Theories for an Engineering of Socio-Environmental
Systems). Finally, I am participating in the development of the GAMA platform for multi-agent modelling and simulation.
Rémi GENEVEY

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TITLES AND DIPLOMAS
1978: École supérieure des sciences économiques et commerciales (ESSEC).

PRESENT PROFESSIONAL POSTING
I have been the director of the AFD in Viêt Nam since September 2013, and before this I was the Executive Director in charge of management strategy covering economic research, macroeconomic analysis, assessment, strategic management and AFD’s business university, the CEFEB, whose training programme is recognised as a Master’s 2. As the Director of Strategy, I was an administrator of the IRD and the Iddri and was also responsible for the publishing of AFD’s scientific collections.

Before this, I was the Financial Director of AFD (2006-2008), Director of the Mediterranean and Middle East Department (2002-2005), Director of AFD Group in Morocco (1999-2002), and Deputy Chief Executive Officer of PROPARCO, an AFD subsidiary in charge of the financing of the private sector (1994-1999).

CURRENT MISSIONS AND RESEARCH WORK
I was trained as a financier and have a passion for economic development geography. Most of my career has been devoted to the adaptation of the best practices for financial tools to the particular situations in which developing countries and French overseas territories find themselves. This work has principally concerned the development of financial instruments adapted to economic players in both the public and private sectors, actors in DCs, as well as the conception of the most efficient methods of refinancing.

More recently, the strategic orientations of AFD in the domains of sustainable development and the fight against climate change, and also for our adaptation to these changes, have led me to put my knowledge as a development practitioner at the service of this global ambition of AFD Group, which has now committed itself to devoting more than 50% of its annual commitments (70% in Asia) to projects that will have a positive (and measurable) impact in this area.
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TITLES AND DIPLOMAS
2000: Ph.D. in Economics, University of Boulogne, Dijon, unanimous congratulations from the jury. Prix Vouters.

PRESENT PROFESSIONAL POSTING
Economics lecturer at the University Rennes 2, Social Sciences faculty, Rennes, France. Teacher of the Master’s course “Europe-Asia economic relations”, Rennes 2-Foreign Trade University, Hà Nội - Việt Nam.
Currently guest CNRS researcher at the IRASEC, Kuala Lumpur post, Malaysia.

CURRENT MISSIONS AND RESEARCH WORK
My studies are in the domain of the economic policy of development in a continuation of the institutionalist perspective characteristic of the French-speaking school. Since my Ph.D. in Malaysian development, my research has concerned a theoretical plan regarding the definition of the integration of institutions in the analysis of the phenomena and dynamics of development. My research, which has been mostly centred on Malaysia for its empirical part, has successively dealt with education, labour and employment, electronic clusters, the trajectory of growth and the State’s role in Malaysia’s emergence. The question of development aid, which remained a marginal part of my work, has been recently addressed using the Colombo Plan (1951 to nowadays) – a plan that was largely forgotten in pan-Asiatic cooperation. I am currently taking quite an interest in the contradictions and transformations of Malaysian politics and economics from the angle of the regulatory programme of the “diversity of Asian capitalisms” (Boyer). Rather than reasoning in terms of the middle-income trap, I seek to define current Malaysian capitalism in its own specificity and dynamics, including at the labour dimension level seen in the context of regionalisation and the rise of Chinese power.
Nicolas MARILLEAU

Email: nicolas.marilleau@ird.fr

TITLES AND DIPLOMAS

2006: Ph.D. in Computer Sciences, University of Franche-Comté.

PRESENT PROFESSIONAL POSTING

Research engineer at the UMI 209 UMMISCO at the IRD since 2006, associate researcher since 2010 at Femto-ST, University of Franche-Comté.

CURRENT MISSIONS AND RESEARCH WORK

My research activities belong to the domains of distributed systems: the collaboration and modelling-simulation of complex systems such as they are treated in ecology, geography or robotics. This implies implementing conceptual approaches (methodologies, formalisms) and adapted collaborative tools in order to help thematicians in their scientific approach.

As a modeller, I mainly collaborate with thematicians who are biologists and geographers in the framework of several research projects such as MIRO (Arnaud Banos, ANR, 2009-2013), Camisole (Laetitia Bernard, FRB, 2014) and Pampiope (Sebastien Barrot, Andra, 2013). This applied research consists in the conception of models and simulators, and serious games. Furthermore, it feeds into a fundamental thinking process about the modelling/simulation of complex systems by providing different points of view.

The originality of my work is that it considers both the distribution of competences and the distribution of calculation at the same time. The challenge is to develop concepts and tools in order to make modelling-simulation processes accessible to as wide a scientific and operational community as possible. For example, I wish to include high-performance calculating systems in the modelling-simulation context. I am no stranger to this research issue given the research I carried out before coming to the IRD. In the framework of the Spirales tender 2010, I submitted the EPIS project (IRD-Spirales, 2010-2011) in which teams from UMMISCO (Bondy, Dakar, Hà Nội), the LIFC (Besançon), the LIRMM (Montpellier) and Eco&Sol (Montpellier) participate. This project aims to promote an educational infrastructure, coupled with high-performance calculation infrastructure (cluster and/or grid) that allows the development of simulations and the exploration of models in record time.

Thus, in 2010, some veritable research work concerning the distribution of complex modelling/simulation systems began and is being developed in my laboratory.
Hypatia NASSOPOULOS

Email: hypatia.nassopoulos@eivp-paris.fr

TITLES AND DIPLOMAS


PRESENT PROFESSIONAL POSTING

I am a lecturer/researcher at the École des Ingénieurs, Paris (EIVP), in the energy and climate pole. I represent the EIVP in the European community of knowledge and innovations network (KIC Climate), as well as in the setting up of innovation projects. I also represent the EIVP in the framework of the setting up of European projects H2020 (scientific, financial and administrative aspects). I am also in charge of traineeships at the EIVP and participate in the academic supervision of students at the EIVP, through my lectures and supervising of projects within the Energy and Climate pole.

CURRENT MISSIONS AND RESEARCH WORK

My research mainly deals with climate change (CC) and notably the inclusion of the issue of adaptation to climate change on operational local scales, particularly at the urban development scale.

I am currently involved in the Adaptatio research project that is financed by the French Ministry for Ecology, Sustainable Development and Energy. The aim of the project is to propose a new methodology for the inclusion of CC adaptation in the conception process of urban development projects. This entails thinking about adaptation and mitigation jointly and prior to the urban development project conception process, by focusing on two key resources: energy and water. In the framework of this research, the objective is to develop a new assessment tool for the water and energy consumption of an urban project for different climatic scenarios and technical choices, and to bring together, in the framework of the decision-making process, all the stakeholders/practitioners involved in this process. In this framework, I coordinate three research issues:

- In order to bring the adaptation to CC challenge closer to the operational sphere, interviews are conducted with agents from the City of Paris and public/private sector players who are involved in urban development projects. The aim is to assess the understanding of urban public/private sector practitioners of the CC challenge, and to see if the latter is taken into account in their operational activities. These interviews allow us to identify a Paris urban development project that may be used in order to test the multidisciplinary approach developed within the framework of the Adaptatio project;

- In order to provide the quantitative information to foresee the future situation and think beforehand about the adaptability and flexibility of an urban development process, modelling activities are carried out with ENVI-met, a three-dimensional software programme that is immobile and
non-hydrostatic. The ENVI-met software programme is used in order to analyse, at the urban development project level, the urban microclimate from the angle of different climate scenarios and technical choices;

- In order to propose a new framework for organisation and reflection with the active participation of all the stakeholders concerned and thereby involve them in the innovation process, exploratory research is being carried out on the Design Thinking theory. The aim is to discover all the aspects of this theory and establish a parallel with the process of urban development, with a view to identifying all the potential synergies.
Email: damien.philippon.dev@gmail.com

TITLES AND DIPLOMAS

2015: Master’s in Computer Sciences, option “Intelligent Systems and Multimedia” at the Institut de la Francophonie pour l’Informatique (IFI), a twin degree course with the University of La Rochelle (year 2).

PRESENT PROFESSIONAL POSTING

I have a Bachelor’s degree in computer studies with a “developer” option and also a “multimedia” one, I am completing my training by learning about the modelling of complex systems within a framework more geared to research in order to carry out doctoral work in a Southeast Asian country.
Biographies of Speakers

Adrian POP

Email: adrian.pop@univ-nantes.fr

TITLES AND DIPLOMAS

2012: Accreditation for direct research, "Essays on Banking Supervision, Regulation, and Corporate Governance", University of Nantes.

2005: Ph.D. in Economics, "Market discipline in banking regulation: the role of subordinated debt", University of Orléans, very honourable distinction with the unanimous congratulations of the jury, proposed for a thesis prize and a grant for publication, award for monetary and banking thesis by the Fondation Banque de France (February 2006).

PRESENT PROFESSIONAL POSTING

Lecturer at the University of Nantes (since November 2006), in charge of supervising the Master’s 2 "Banque, Chargés de clientèle Professionnels (Banking, Professional Customer Account Managers)", (work-linked training, in collaboration with the Centre de formation de la profession bancaire), consultant for the Autorité de Contrôle Prudentiel (ACP), Banque de France (2008-2013), consultant for Agence France-Presse (AFP), 2007-2008.

CURRENT MISSIONS AND RESEARCH WORK

My research issue is centred on banking risks, financial crises and the prudential regulation of banks. Some other issues that I address in my research are: privatisation and enterprise governance in emerging countries, credit derivatives, principles of Islamic finance.

My research into banking economics is centred on three principal axes:

- The role of market discipline in the prudential regulation of banks, pricing policies of banking debt instruments on world financial markets, the Basel Capital Accord on equity capital;

- Systemic risk, financial contagion effects and "the Too-Big-To-Fail" doctrine, assessment of the market reaction to systemic bankruptcies of banking establishments and/or to changes in public policy with regard to systemic risk banks;

- The macro-prudential regulation of financial systems, the pro-cyclical impact of financial regulation, calibration of macroeconomic stress tests in the banking sector.

My research work is essentially empirical and aims to test the relationships, intuitions and hypotheses of behaviour predicted by economic theory. Most of my research projects are carried out in collaboration with economists from the ACP/Banque de France and are based upon micro and macroeconomic databases.
Email: diana.pop@univ-angers.fr

TITLES AND DIPLOMAS

2006: Ph.D. in Economics under the supervision of Xavier Galiègue, University of Orléans: “Corporate governance in transition countries: the experience of the Romanian acquisitions’ market”, very honourable distinction with the unanimous congratulations of the jury.

PRESENT PROFESSIONAL POSTING

Lecturer at the University of Angers and researcher with the Angers research group in economics and management (GRANEM) since September 2009. Since 2012, I have been jointly in charge of teaching the Master’s 2 “Financial services in enterprises” at ESEMAP. Since 2014, I have been jointly in charge of the GRANEM research pole “Finance, Regulation, Governance”.

RESEARCH WORK

My research issue centres on the vast theme of corporate governance in emerging countries. This issue particularly concerns the chain of share investment, namely the identification of investors and control structures, the reinforcement of the exercising of investors’ rights, notably minority shareholders, and the commitment of shareholders in the new landscape of the financing of enterprises that are quoted on the stock market. My research, which is essentially empirical, aims to highlight the particular institutional framework of emerging markets and the economic basis of the different reforms implemented in the interest of regional and international regulatory harmonisation.

The calling into question of the current model of governance that incites the pursuit of short-term objectives requires a better understanding of the mechanisms that skew the economic results of enterprises. Hence the need to identify the particular aspects of corporate behaviour, namely capital operations – transactions concluded between related parties – and stock market operations carried out by insiders, which are likely to explain the governance-value creation relationship. These themes are based upon original data that were mostly collected by hand, as well as upon microeconomic databases.
Email: charlotte.raymond@i-care-consult.com

TITLES AND DIPLOMAS


PRESENT PROFESSIONAL POSTING

“Air, Climate, Energy” project leader, EnvirOconsult (enterprise), project leader specialised in international matters.

CURRENT MISSIONS AND RESEARCH WORK

I am a consultant specialised in the sustainable development strategies of national and local authorities, and air quality issues, climate change and energy management. As the EnvirOconsult project leader, I participate in many public policy studies such as Plans Territoriaux Climat Energie (PCET) for French and foreign communities. I am specialised in planning methodologies, governance and the participatory processes linked to climate change and the sustainable city.

I am mainly involved in the following axes:

- The elaboration and guidance of climate and energy public policies;
- Good practice and strategic positioning on climate studies;
- The interconnection between urban development/the sustainable city and climate/energy challenges for national and international institutions.
Shared Challenges for Development within ASEAN

Irène SALENSON

Email: salensoni@afd.fr

TITLES AND DIPLOMAS
1997: Agrégation in Geography.

PRESENT PROFESSIONAL POSTING
Study leader in the research division at AFD.

CURRENT MISSIONS AND RESEARCH WORK
The post of study leader at AFD includes several aspects:

- The guidance of research programmes, led by research institutes that are external to AFD and which more often than not have a multi-disciplinary dimension (grouping of researchers and experts that associate economists, town planners, sociologists, engineers), on the following subjects: sustainable cities, city and climate, eco-neighbourhoods, essential services (including waste management);

- Expertise in the domain of sustainable development: internally – opinion on the operational project of AFD, opinion on publications in this domain, externally – participation notably in the “Sustainable Cities” working group for the French Facility for Global Environment;

- Training activities and support for training activities (notably student workshops, working as consultancies for AFD in order to identify new ways of financing projects).

My past and current research topics concern the following aspects:

- Elaboration and challenges of urban policies: town planning, relationships between public and private players in urban development, influence of political issues on urban decisions;

- Civil society and town planning: participation of inhabitants in the development process, elaboration of city dweller strategies alternative to the urban policies of the authorities, role of non-governmental organisations (NGOs);

- Development of natural heritage and historic buildings, identity issues, development challenges, economic challenges;

- Sustainable urban development and development challenges in Southern cities: specific challenges, role of international cooperation.
Email: tertrais@univ-paris1.fr

**TITLES AND DIPLOMAS**

*Agrégation* in History.

Chinese language diploma.

Doctor in history, accreditation for direct research.

University Professor.

**PRESENT PROFESSIONAL POSTING & RESPONSIBILITIES**

Professor of contemporary history at the University Paris 1 Panthéon-Sorbonne.

Director of the *Centre d'histoire de l'Asie contemporaine* (CHAC), UMR IRICE (CNRS-Universities Paris 1 & Paris 4).

Director of the Master’s "History of international relations and foreign worlds", University Paris 1 Panthéon-Sorbonne.

President of the *Commission d'histoire des relations internationales* (CHIR), *Comité international des sciences historiques* (CISH).

President of the *Société française d'histoire des Outre mers* (SFOM) & director of the publication of *OUTRE MERS revue d'histoire*.

Member of the Scientific Council of the GIS Asia/Asia &Pacific network.

**CURRENT MISSIONS AND RESEARCH WORK**

I develop my teaching, research and scientific guidance around the history of contemporary Asia, principally in the 20th century, both as a continent and in its relations with the rest of the world.

I have worked on its conflicts, the Indochina War in particular, which I proposed to “think about in terms of its cost”, a method that allows us to look at the conflict in a different way and understand it better. I also deal with the subsequent Việt Nam War that had a strong regional dimension. I have specifically developed my analyses about Southeast Asia, as it has been recently denominated, a new region that is emerging from the conflicts that have marked its history since 1945.

My work shows great awareness of long-term legacy and national identities, and the recurrent question of the very definition of Asia, and I thus examine regional construction, particularly in Southeast Asia, by comparing it with what is happening in Europe: ASEAN of course, a unique institutional process in Southeast Asia, but also everything that strengthens regional integration, particularly at an economic level. The context is one of unprecedented economic growth and a rise in the region’s
influence, which is marked by a constant evolution of the relationships between its principal players: Japan, China, India, to which Southeast Asia may be now added.

The construction of Asia, understood both in time and as a project, thus appears as both a product of long-term history and of current developments. It lies at the foreground of world reconfiguration.
Email: tcquang@ctu.edu.vn

TITLES AND DIPLOMAS
2009: Master’s degree in Cartography, Remote Sensing and Geographic Information Systems, Polytechnic University, Hồ Chí Minh City.
2001: Diploma in Computer Engineering, University of Cần Thơ, Việt Nam.

PRESENT PROFESSIONAL POSTING
Teacher at the University of Cần Thơ. Doctoral student in computer sciences (modelling and complex systems) under the joint supervision of the University Pierre et Marie Curie and the University of Cần Thơ.

CURRENT MISSIONS AND RESEARCH WORK
I am a lecturer in the Department of Field Resources (Faculty of the Environment of Cần Thơ). I give lessons on databases, geographic information systems (GIS) and modelling to students on the field management course.

I am preparing a Ph.D. My subject concerns modelling and land use in the coastal region of the Mekong. It is a subject that uses modelling and agent-based simulation in order to study land use under the effect of climate change and particularly the rise in sea levels and the salt water flooding that annually affects the Mekong delta. This work is part of the cooperation project between the IRD and the University of Cần Thơ (ACCLIMATE PEERS project).
Krisna UK

Email: krisna.uk@khmerstudies.org

TITLES AND DIPLOMAS
2006: Master’s in Social Anthropology, Cambridge University.

PRESENT PROFESSIONAL POSTING
Director of the Centre d’Etudes Khmères (CKS) since 2013. Member of the Board of Trustees of Cambodia Trust (2007-2012).

CURRENT MISSIONS AND RESEARCH WORK
The CKS that I have been directing for more than two years is an American multidisciplinary research centre that groups together historians, anthropologists, linguists and Sanskritists who are interested in Cambodia and the Southeast Asian region.

My personal field of research mainly covers the ethnic minorities from north-east Cambodia, and the survival strategies adopted by the local populations in the regions affected by mines and bombs (Cambodia, Laos, Myanmar, Việt Nam), as well as by environmental problems such as the current political and social challenges posed by the degradation and exploitation of natural resources in ASEAN countries.
**Thomas VALLEE**

*Email*: thomas.vallee@univ-nantes.fr

**TITLES AND DIPLOMAS**

2010: *Agrégation* in Economy.
1999: Ph.D. in Economics, University of Nantes, congratulations of the jury.

**PRESENT PROFESSIONAL POSTING**

Professor at the University of Nantes.
Director of the *Laboratoire d’économie et de management de Nantes-Atlantique* (LEMNA).

**CURRENT MISSIONS AND RESEARCH WORK**

My research issues concern decision theory/game theory, multi-criteria analysis, network theory, the construction of composite indicators and dynamic economics. They have multiple applications, but prioritise problems concerning the exploitation of natural resources, negotiation problems and shaping dynamics within both commercial and managerial networks.

I am the scientist in charge of the implementation of a World Bank project aiming to create, within the National University of Management in Phnom Penh (Cambodia), an observatory devoted to maritime transport, aquaculture and fishing sectors. Finally, I am currently supervising or co-supervising several doctoral theses concerning the following subjects of study: third generation bio-fuels, integration and commercial dynamics measures in Southeast Asia, the construction of composite indicators to measure the impact of coastal tourism in Việt Nam and the impact of the exploitation of the gold mining sector in Burkino Faso.
Clémence Vidal de la Blache

Email: vidaldelablachec@afd.fr

DIPLÔMES

2008: MSc International Relations, London School of Economics.
2008: Master’s in Relations Internationales, Sciences Po (summa cum laude).

PRESENT PROFESSIONAL POSTING

Project leader in AFD’s Local Authorities and Urban Development Division since January 2013, after five years of international professional experience.

I am in charge of the management, negotiation and monitoring of urban infrastructure projects, mainly in the ASIA zone (Philippines, Laos, Sri Lanka, India, Bangladesh, Indonesia) and in Turkey. These projects mobilise the terms and conditions of various methods of financing, and are often set up in partnership with other multilateral and bilateral donors.

While the “Cities & Climate” issue lies at the heart of AFD’s mandate in these regions, I also support several crosscutting projects on this theme. In 2015, this was notably expressed by the monitoring of a study on the methods of financing urban “climate” investments via local financial institutions.
Email: voducanvn@yahoo.com

TITLES AND DIPLOMAS
2012: Ph.D. in Computer Sciences, University Paris 6.

PRESENT PROFESSIONAL POSTING
Since July 2007, I have been working in the MSI-IFI team as a trainee/engineer. I am participating in the development of the agent-based simulation and modelling platform GAMA (http://gama-platform.googlecode.com). The platform is used to develop several agent-based models, epidemiology, aid management following natural disasters, insect invasions, etc.

I have been studying for a Ph.D. financed by the Agence Universitaire de la Francophonie under Alexis Drogoul (Director of Research, IRD). I have worked in two laboratories: in Hà Nội and the IRD in Bondy, France. The aim of my thesis was to propose an agent-based modelling language in order to develop multi-level agent-based models.

I am currently lecturing at the Computer Sciences Faculty of Đà Nẵng Polytechnic University.
Vũ Thị Mai Hương

Email: vumaihuongdn@gmail.com

TITLES AND DIPLOMAS

PRESENT PROFESSIONAL POSTING
March 2011 – Present: DA NANG CLIMATE CHANGE COORDINATION OFFICE (CCCO). Đà Nẵng is a state city in Việt Nam. It is located in the centre of Viet Nam and is a dynamic city (website: www.danang.gov.vn). Based on my experience and knowledge of climate change and environment and my motivation, in March, 2011, the Director of the Da Nang Deparment of Natural Resources and Environment (DONRE) assigned me to work for Da Nang CCCO. Đà Nẵng CCCO is a Da Nang government agency and acts as permanent advice office for the Da Nang City Steering Committee for Response to Climate Change (website: www.ccco.danang.gov.vn).
Acronyms and Abbreviations

ACCP  ASEAN Committee on Consumer Protection
ACCRN  Asian Cities Climate Change Resilient Network
ACHIA  Air Pollution and Climate Change Health Impact Assessment
ACIA  ASEAN Comprehensive Investment Agreement
ACOCLI Cognitive Adaptations to Climate Change
ACP  Autorité de Contrôle Prudentiel
ACU  Asian Currency Unit
ADB  Asian Development Bank
ADEME  Agence de l'environnement et de la maîtrise de l'énergie
AEC  ASEAN Economic Community
AFD  Agence Française de Développement
AFP  Agence France-Presse
AFTA  ASEAN Free Trade Area
AHN  ASEAN Highway Network
AIIB  Asian Infrastructure Investment Bank
AMRO  ASEAN+3 Macroeconomic Research Office
AMU  Asian Monetary Unit
ANR  Agence Nationale de la Recherche
ANRU  Agence nationale pour la rénovation urbaine
APEC  Asia-Pacific Economic Cooperation
ATAP  ASEAN Transport Action Plan
ASEAN  Association of Southeast Asian Nations
ASEM  Asia-Europe Meeting
ASTP  ASEAN Strategic Transport Plan
AUF  Agence universitaire de la francophonie
AusAID  Australian Cooperation Agency
BBC  Bâtiment basse consommation
BEZ  Border Gate Economic Zones
BHNS  Bus à haut niveau de service
### Shared Challenges for Development within ASEAN

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>BIMP-EAGA</td>
<td>Brunei Darussalam, Indonesia, Malaysia and the Philippines-East ASEAN Growth Area</td>
</tr>
<tr>
<td>BM</td>
<td>Board Meeting</td>
</tr>
<tr>
<td>BRT</td>
<td>Bus Rapid Transit</td>
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<tr>
<td>CAD</td>
<td>Comité d’aide au développement</td>
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<tr>
<td>CAF</td>
<td>Corporacion Andina de Fomento</td>
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<td>CASE</td>
<td>Southeast Asian Centre</td>
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<tr>
<td>CBD</td>
<td>Central Business District</td>
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<td>CBTA</td>
<td>Cross-Border Transport Agreement</td>
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<td>CC</td>
<td>Climate Change</td>
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<td>CCOO</td>
<td>Climate Change Coordination Office</td>
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<tr>
<td>CCTV</td>
<td>Climate Change and Urban Green Zones: Towards an Interdisciplinary Approach</td>
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<tr>
<td>CDC</td>
<td>Centers for Disease Control and Prevention</td>
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<td>CEMCA</td>
<td>Center for Mexican and Central American Studies</td>
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<tr>
<td>CEP</td>
<td>Common Effective Preferential Tariff</td>
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<td>CEZ</td>
<td>Coastal Economic Zones</td>
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<td>CHAC</td>
<td>Centre d’histoire de l’Asie contemporaine</td>
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<td>CHIR</td>
<td>Commission d’histoire des relations internationales</td>
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<tr>
<td>CIDA</td>
<td>Canadian International Development Agency</td>
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<tr>
<td>CIRAD</td>
<td>Centre international de recherche agronomique pour le développement</td>
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<tr>
<td>CIRCE</td>
<td>Regional Climate Change and Impacts in the Mediterranean Region</td>
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<tr>
<td>CILT</td>
<td>Chartered Institute of Logistics and Transport</td>
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<tr>
<td>Cis</td>
<td>Composite Indicators</td>
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<tr>
<td>CISH</td>
<td>Comité international des sciences historiques</td>
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<td>CKS</td>
<td>Center for Kmer Studies</td>
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<tr>
<td>CLIM 2</td>
<td>Climatisation and Urban Climate</td>
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<tr>
<td>CLIM-RUN</td>
<td>Climate Local Information in the Mediterranean Region Responding to User Needs</td>
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<tr>
<td>CM</td>
<td>Common Market</td>
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<td>CMLV</td>
<td>Cambodia, Myanmar, Laos, Việt Nam</td>
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<tr>
<td>CNDP</td>
<td>National Commission for Public Debate</td>
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<tr>
<td>CNRS</td>
<td>Centre national de recherche scientifique</td>
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<tr>
<td>COP</td>
<td>Conference of the Parties</td>
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<td>CRUEIP</td>
<td>Central Region Urban Environmental Improvement Project</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>CU</td>
<td>Customs Union</td>
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<td>DAC</td>
<td>Development Assistance Committee</td>
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<td>DBT</td>
<td>Danish Board of Technology Foundation</td>
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<td>DDF</td>
<td>Development of Investment Funds</td>
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<td>DMIC</td>
<td>Delhi Mumbai Industrial Corrido</td>
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<tr>
<td>DRIAS</td>
<td>Giving Access to French Regional Climatic Scenarios to Study their Impact and Adaptation of our Societies and Environments</td>
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<tr>
<td>DRVN</td>
<td>Democratic Republic of Việt Nam</td>
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<td>EAEC</td>
<td>East Asian Economic Caucus</td>
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<td>ECDC</td>
<td>European Centre for Disease Prevention and Control</td>
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<tr>
<td>ECU</td>
<td>European Currency Unit</td>
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<tr>
<td>ÉFEO</td>
<td>École française d’Extrême-Orient</td>
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<tr>
<td>EIN</td>
<td>European Investment Bank</td>
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<td>EIVP</td>
<td>École des Ingénieurs de la Ville de Paris</td>
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<td>EPHE</td>
<td>École pratique des hautes études</td>
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<td>EPZ</td>
<td>Export Processing Zones</td>
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<tr>
<td>ERIA</td>
<td>Economic Research Institute for ASEAN</td>
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<td>EU</td>
<td>European Union</td>
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<tr>
<td>EWEC</td>
<td>East West Economic Corridor</td>
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<tr>
<td>FDI</td>
<td>Foreign Direct Investment</td>
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<tr>
<td>FNAU</td>
<td>Fédération nationale des agences d’urbanisme</td>
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<tr>
<td>FTA</td>
<td>Free Trade Area</td>
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<tr>
<td>FTZ</td>
<td>Free Trade Zone</td>
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<tr>
<td>GASS</td>
<td>Graduate Academy of Social Sciences</td>
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<tr>
<td>GATS</td>
<td>General Agreement on Trade in Services</td>
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<tr>
<td>GAMA</td>
<td>Gis and Agent-Based Modelling Architecture</td>
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<tr>
<td>GAML</td>
<td>Gama Modeling Language</td>
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<tr>
<td>GDN</td>
<td>Global Development Network</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>GHG</td>
<td>Greenhouse Gas Emissions</td>
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<tr>
<td>GIS</td>
<td>Geographical Information Systems</td>
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<tr>
<td>GMS</td>
<td>Greater Mekong Subregion</td>
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<tr>
<td>GNP</td>
<td>Gross National Product</td>
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<tr>
<td>GUI</td>
<td>Graphic User Interface</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>HDI</td>
<td>Human Development Index</td>
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<tr>
<td>IAI</td>
<td>Initiative for ASEAN Integration</td>
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<tr>
<td>IBRD</td>
<td>Bank for Reconstruction and Development</td>
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<tr>
<td>ICLEI</td>
<td>International Council for Local Environmental Initiatives</td>
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<tr>
<td>IEF</td>
<td>Index of Economic Freedom</td>
</tr>
<tr>
<td>IFI</td>
<td>Institut de la francophonie pour l'informatique</td>
</tr>
<tr>
<td>IMT-GT</td>
<td>Indonesia-Malaysia-Thailand Growth Triangle</td>
</tr>
<tr>
<td>IFM</td>
<td>International Monetary Fund</td>
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<tr>
<td>ILO</td>
<td>International Labour Organization</td>
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<tr>
<td>INVULNERABLE 2</td>
<td>Vulnerability of Enterprises</td>
</tr>
<tr>
<td>IPCC</td>
<td>Intergovernmental Panel on Climate Change</td>
</tr>
<tr>
<td>IRD</td>
<td>Institut de recherche pour le développement</td>
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<tr>
<td>IRASEC</td>
<td>Institut de recherche sur l'Asie du Sud-Est contemporaine</td>
</tr>
<tr>
<td>IWRM</td>
<td>Integrated Water Resources Management</td>
</tr>
<tr>
<td>JTD</td>
<td>Journées de Tam Đảo (Tam Đảo Days)</td>
</tr>
<tr>
<td>KEXIM</td>
<td>Korean Cooperation Agency</td>
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<tr>
<td>LEMNA</td>
<td>Laboratoire d’économie et de management de Nantes-Atlantique</td>
</tr>
<tr>
<td>MAELIA</td>
<td>Multi-Agent for Environmental Norms Impact Assessment</td>
</tr>
<tr>
<td>MERCOSUR</td>
<td>Common Market of the South</td>
</tr>
<tr>
<td>MEU</td>
<td>Monetary Economic Union</td>
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<tr>
<td>MIETC</td>
<td>Mekong India Economic Corridor</td>
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<tr>
<td>MIMA</td>
<td>Maritime Institut of Malaysia</td>
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<tr>
<td>MMTT</td>
<td>Multi-Modal Transit Transport</td>
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<tr>
<td>MPAC</td>
<td>Master Plan on ASEAN Connectivity</td>
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<tr>
<td>MRB</td>
<td>Metropolitan Rail Transport Project Board</td>
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<tr>
<td>MSE</td>
<td>Mean Square Error</td>
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<tr>
<td>MSR</td>
<td>Maritime Silk Road</td>
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<tr>
<td>NAFTA</td>
<td>North American Free Trade Agreement</td>
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<tr>
<td>NICs</td>
<td>New Industrialised Countries</td>
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<tr>
<td>NGO</td>
<td>Non-Gouvernemental Organisation</td>
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<tr>
<td>NTMs</td>
<td>Non-tariff Measures</td>
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<tr>
<td>OECD</td>
<td>Southeast Asia Corporate Governance Initiative</td>
</tr>
<tr>
<td>ODA</td>
<td>Official Development Assistance</td>
</tr>
<tr>
<td>Acronyms and Abbreviations</td>
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<td>----------------------------</td>
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<tr>
<td>OLS</td>
<td>Ordinary Least Squares</td>
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<tr>
<td>ONERC</td>
<td>Observatoire national sur les effets du réchauffement climatique</td>
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<tr>
<td>PCET</td>
<td>Plans territoriaux climat énergie</td>
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<tr>
<td>PERIURB</td>
<td>Urban Forms, Settlement Patterns and Urban Climate in the Urban Peripheries of Toulouse</td>
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<tr>
<td>PPPs</td>
<td>Public-Private Partnerships</td>
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<tr>
<td>PU</td>
<td>Political Union</td>
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<tr>
<td>RAMONS</td>
<td>Mobilisation of Interdisciplinary Knowledge and Interface between Climate Sciences, Society and Politics</td>
</tr>
<tr>
<td>RIETI</td>
<td>Research Institute of Economy, Trade and Industry</td>
</tr>
<tr>
<td>RULE</td>
<td>Royal University of Law and Economic Sciences (Cambodia)</td>
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<tr>
<td>SAFELAND</td>
<td>Living with the Risk of Landslides in Europe: Assessment, Effects of Global Change and Risk Management Strategies</td>
</tr>
<tr>
<td>SARS</td>
<td>Severe Acute Respiratory Syndrome</td>
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<tr>
<td>SDGs</td>
<td>Sustainable Development Goals</td>
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<tr>
<td>SEATO</td>
<td>Southeast Asian Treaty Organisation</td>
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<tr>
<td>SECIF</td>
<td>Towards Climatic Services for French Industries</td>
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<tr>
<td>SEZs</td>
<td>Special Economic Zones</td>
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<tr>
<td>SFHOM</td>
<td>Société française d’histoire des Outre-mer</td>
</tr>
<tr>
<td>SGM</td>
<td>Shareholders’ General Meeting</td>
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<tr>
<td>SKRL</td>
<td>Singapour-Kunming Rail Link</td>
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<tr>
<td>SMAC</td>
<td>Systèmes multi-agents coopératifs</td>
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<tr>
<td>SP-RCC</td>
<td>Support Program to respond to Climate Change</td>
</tr>
<tr>
<td>SVG</td>
<td>Scalable Vector Graphics</td>
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<tr>
<td>TAGP</td>
<td>Trans-ASEAN Gas Pipeline</td>
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<tr>
<td>TAR</td>
<td>Trans-Asian Highway</td>
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<tr>
<td>TPP</td>
<td>Trans-Pacific Partnership</td>
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<tr>
<td>TRANSITER</td>
<td>Dynamiques transnationales et recompositions territoriales</td>
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<tr>
<td>UML</td>
<td>Unified Modeling Language</td>
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<tr>
<td>UN</td>
<td>United Nations</td>
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<tr>
<td>UN Comtrade</td>
<td>United Nations Commodity Trade Statistics Database</td>
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<tr>
<td>UNCTAD</td>
<td>United Nations Conference on Trade and Development</td>
</tr>
<tr>
<td>UNEP</td>
<td>United Nations Environment Programme</td>
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<tr>
<td>UNFCCC</td>
<td>United Nations Framework Convention on Climate Change</td>
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</tbody>
</table>
### Shared Challenges for Development within ASEAN

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
</tr>
<tr>
<td>VASS</td>
<td>Việt Nam Academy of Social Sciences</td>
</tr>
<tr>
<td>VegDUD</td>
<td>The Role of Vegetation in Sustainable Urban Development – An Approach using the Challenges linked to Climatology, Hydrology and the Mastery of Energy and Environments</td>
</tr>
<tr>
<td>VULIGAM</td>
<td>Vulnerability of the Coastal Systems of a Large Mediterranean Agglomeration</td>
</tr>
<tr>
<td>VURCA</td>
<td>Urban Vulnerability during Heat Waves and Adaptation Strategies</td>
</tr>
<tr>
<td>VuReCCUrbain</td>
<td>Vulnerability and Resilience to Climate Change in the Urban Environment</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
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<tr>
<td>WMO</td>
<td>World Meteorological Organization</td>
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</tbody>
</table>
Various authors

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“Tam Đảo Summer School Week” (Đà Nẵng, Việt Nam)
(Những thách thức phát triển chung trong khối ASEAN
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This work contains a verbatim account of the presentations and debates from the plenary sessions and workshops that took place from 17th to 29th July 2015 at the University Duy Tân (Đà Nẵng) on the topic of “Shared Challenges for Development within ASEAN”. Four main areas of reflection are prioritised in the framework of the thematic workshops: (i) Economic, Financial and Logistical Integration in ASEAN; (ii) Epidemiological Risks and Integration of Health Policies on a Regional Scale: Modelling to Make Better Decisions; (iii) Development Corridors in ASEAN; (iv) Cities and Climate.