Joint Master's Thesis – 45 ECTS

SUSTAINABLE INFRASTRUCTURE DEVELOPMENT

A SOCIO-ECONOMIC IMPACT ANALYSIS OF AIRPORT DEVELOPMENT IN VIET NAM

Submitted by
Pascal Fentsch and Jes Halim Nauckhoff
Department of Geosciences

In partial fulfilment of the requirements
For the degree of Master of Science

Universiteit Utrecht

February 2013

Universiteit Utrecht

Joint Master's Thesis

Sustainable Infrastructure Development – A Socio-economic Impact Analysis of Airport Development in Viet Nam

Contact:

Pascal Fentsch (3593347) - (pascal.fentsch@gmail.com)

Jes Halim Nauckhoff (3683656) - (j.nauckhoff@gmail.com)

Supervision:

Dr. Guus van Westen

Department of Geosciences
Willem C. van Unnik Building
Heidelberglaan 2
3584 CS Utrecht
The Netherlands

Program:

M(Sc) Environmental Sciences – Sustainable Development

Font:

This paper is written in Garamond, one of the most sustainable and print-efficient fonts

Graphic used by permission of Airis International Holdings, LLC

FOREWORD

This research was prepared in collaboration with Airis International Holdings, LLC and under the guidance of the University of Utrecht in the Netherlands to fulfill the requirements of a Master's Degree (Msc) in Environmental Sciences (Sustainable Development). As a joint thesis, it examines processes of socio-economic development in Soc Son District related to the operation and expansion of Noi Bai International Airport in Hanoi, Viet Nam. The data presented in this study was collected during a two-month fieldwork period and comprises two main research components: a local community survey of people living around the airport and an airport employee survey. Additionally, interviews were conducted with local development experts, government representatives and airport management. The authors hope that the insights provided in this study will bring forth a new impetus for sustainability research in the field of airport development in the emerging economies of Southeast Asia and beyond.

TABLE OF CONTENTS

LIST OF FIGURES

AKNOWLEDGEMENTS

The authors would like to express their gratitude to a number of outstanding individuals without whom this academic endeavour would not have come to fruition. First and foremost this is directed at the Airis family including Mr. Ron Factor and Mr. David Kaplan who, without reservations, provided exceptional support throughout this project. The authors are especially thankful to Mr. Nguyen Trong Nguyen, who has redefined the meaning of the term hospitality and, with his invaluable personal contacts and knowledge, greatly facilitated the successful completion of the fieldwork in Viet Nam. Next, many thanks go to Dr. Guus van Westen, who despite his busy schedule, provided honest, insightful and constructive feedback throughout the course of the research. The authors would also like express their sincere gratitude to Ms. Duong Thi Nhung and Ms. Vuong Quynh Loan. Their unmitigated enthusiasm, generous assistance, and brilliant translation/organization skills greatly contributed to making this project possible, but also turned the authors' stay in Viet Nam into an unforgettable time filled with laughter and great food.

Local community access was greatly facilitated by Ms. Dinh Thi Anh Tuyet from the Rural Enterprise Development Center VietED and Ms. Tran Thi Du from the Women's Union of Soc Son District. Mr. Nguyen Duc Hung, vice president of the Airport Corporation of Viet Nam was instrumental in enabling the airport employee questionnaire. Moreover, first-hand information on local development processes in peri-urban Hanoi were provided by Mr. Pham Van Hoi from the Hanoi Agricultural University. Their helpfulness and cooperation is deeply appreciated. Lastly and most importantly, the authors would like to thank their friends and families for their boundless and unquestioning support over the past year. Their patience, advice, and understanding made this research possible.

ABSTRACT

Airport operation and development in Southeast Asia is at a crossroads. In order to maintain high levels of socio-economic development and improve national competitiveness within an increasingly globalized economic system, governments throughout the region are investing heavily to modernize their outdated and frequently under-dimensioned aviation facilities. While these processes have been found to benefit countries at the national and regional level, the associated socio-economic impacts on people living in the vicinity of major airports have seldom been documented in academic literature. The research uses a case study of Noi Bai International Airport in Hanoi, Viet Nam, to examine how the access to available livelihood assets can influence the adaptability of local households to processes of change related to airport operation and development. Using surveys from airport employees and local residents, complimented by expert interviews, the research explores the airport-related socio-economic spillovers which reinforce vulnerability and marginalization among low-income households in Soc Son District. The aim of the research is to illustrate the need for innovative, context-specific, and sustainable models of airport development that can mitigate negative spillovers while fostering economic growth and sustainable development at the local level.

Keywords: Vietnam; Noi Bai Airport; infrastructure planning; peri-urban development; local livelihoods; socio-economic impact assessment; mega projects.

1. INTRODUCTION

International airports are key drivers of global productive integration, providing the transactional space for over three billion travellers and 48 million tonnes of cargo annually (ACI 2011). This represents a substantial increase from twenty years ago, when roughly one billion people travelled by air (OECD 1993). Consistent growth in air traffic has driven airports to evolve beyond their traditional role as transportation hubs into national/regional economic gateways (O'Connor 1995; Button and Taylor 2000; Karim et al. 2003). In addition to their core transportation function, these modern aviation facilities incorporate a wide array of commercial and industrial activities in their business model, providing an important impetus for local and regional economic development (Kasarda 2006; Wang et al. 2011). Against this backdrop, the global aviation industry is forecast to continue its strong expansion over the next twenty years — with centers of growth shifting away from the saturated markets of North America and Europe toward middle-income and emerging economies (Emerson and Leahy 2010). In the Asia-Pacific privatization, deregulation, regional integration, urbanization, rising income levels, and the convenience of direct connections between major urban centers are encouraging significantly more people to fly each year. As a result, close to half of all commercial air traffic will either be to, from, or within the region by 2027 (Boeing 2007).

In Southeast Asia three in every five international airports currently operate at or over their intended maximum capacity.[1] Airport authorities are scrambling to meet the rapidly increasing demand for air travel by upgrading existing facilities, extending runways, and building new passenger terminals and support functions.[2] In addition, the Association of Southeast Asian Nations (ASEAN) has declared the enhancement of intra-regional connectivity and the extension of transportation networks as central to fostering a more competitive and resilient community (ASEAN 2010). This has spurred significant investments in the region's aviation facilities, providing opportunities for innovative approaches to the current infrastructure constraints that recognize the importance of sustainable development. At the interface between the global and the local, airports are commonly perceived as employment generators and catalysts of wider economic development; however, very little academic literature has investigated the link between airports and sustainable development in the context of emerging economies (Upham et al. 2003).

The research presents Noi Bai International Airport located in Hanoi, Viet Nam, as a case study representative of many of the challenges facing airport operation and development in the ASEAN. Located 45 kilometers from Hanoi city center, in the peri-urban district of

[1] Data was collected for the three largest airports of each ASEAN member-state, which found that 16 out of 26 airports operate at or above their intended capacities. For more information, please see Appendix II.

[2] In this context 22 out of 26 major airports included in the sample are currently in the process upgrading or expanding their facilities.

Soc Son, Noi Bai inaugurated its first modern passenger terminal in 2001. Designed to accommodate six million travellers annually, its maximum capacity has been surpassed in recent years and as of 2011 reached a record eleven million. As a consequence, the airport is in the process of constructing a second terminal to increase total capacity to 16 million passengers by the end of 2014 (Nguyen 2012c). With passenger volumes predicted to surpass this number within five years of completion, terminal buildings three and four and the construction of a third runway are already in the planning stages (ibid.). These developments will occur in an environment characterized by increasing land scarcity, growing residential settlements, rapid urbanization, and an economy dominated by agriculture that is dependent upon access to land to sustain local livelihoods. As a consequence, the manner in which future expansion projects are planned and executed will have a significant impact on people living in Soc Son District.

The central objective of the research is to determine how airport operations and planning can be improved so as to mitigate negative spillovers on local communities in peri-urban environments of Southeast Asia, while at the same time fostering positive socio-economic outcomes. Airports are often hailed as drivers of national, regional and global economies; however, many of the negative impacts associated with airport activities can be found concentrated at the local level. The research aims to identify and measure the costs and benefits of airport-related impacts on local communities within a framework of sustainability inclusive of social, economic and environmental variables. The term sustainability has, in many cases, become a catchphrase used throughout the aviation industry, but without standardized models of assessment or measurement, the merit of its application is difficult to ascertain. Consequently, the examination of past and current impacts of Noi Bai International Airport provides a foundation from which the planning of future developments can be structured to maximise benefits across all spatial scales.

The research is subdivided into two separate yet interrelated components. First, the economic impact section seeks to address how airport development and operation influences the economy of communities located in close proximity to an international airport. Therein special attention is paid to the spatial distribution of economic impacts and the opportunities that exist for local populations to benefit from the economic stimulus provided by airports. Second, the social analysis focuses on the ability of people living in rural/peri-urban areas to adapt to the changes associated with the growing presence of an international airport. Specifically, it examines to what extent the processes associated with the airport impact accessibility to and availability of local livelihood assets, and how the quantity and quality of available assets influence responses to these processes. Combined, the two analytical parts help to determine if the presence of an airport in a low-income, peri-urban setting supports the realization of desired outcomes among local households, or inversely, if it presents additional constraints, increases vulnerability or contributes further to the marginalization of traditional livelihoods.

The structure of this study is separated into nine chapters, excluding references and the appendix. The first chapter introduces the reader to the relevance of the study and provides a brief overview of the theoretical underpinnings of sustainability research and airports. The second chapter examines trends in the aviation industry on a global, regional and national scale, and places emphasis on the relationship between air transportation and development. The first part of chapter 3 investigates the global impacts of the aviation industry and pays specific attention to sustainability challenges. The focus then shifts to the local level, exploring the role of airports and mainstream models of airport development with regard to their applicability to developing countries. Chapter 4 provides the contextual framework of the study, and discusses the main factors that explain the significant growth of the aviation industry in the ASEAN and Viet Nam. This includes key societal indicators such as demographic trends, the institutional system, and the economic context.

Chapter 5 illustrates the research design and methods used to generate data. Additionally, this section presents the research questions and limitations encountered. The next two chapters guide the reader through the data analysis. The first part examines the economic impacts of Noi Bai Airport on the surrounding district of Soc Son and the greater Hanoi metropolitan area. The second part measures variations in the accessibility and availability of five different livelihood assets to gauge which socio-economic characteristics facilitate adaptability to changing economic structures. Chapter 8 provides a discussion of the findings with regard to past, present and future airport-related processes in order to offer a better understanding of the development of Noi Bai Airport and what it means for the local population. Lastly, chapter 9 concludes the research with a summary of the main findings and suggestions for future research.

2. AVIATION AND DEVELOPMENT

The transportation industry represents the lifeline of the global economy. Roads, railways, maritime ports and airports reduce the effects of distance between regions by providing people and goods with physical connectivity to places and markets around the world (WEF 2012). Globalization has driven the role of transportation infrastructure to evolve beyond linking one place to another, to also include the rationalization and reorganization of industrial output and services along geographic corridors. The corridors enable the production specialization and economies of scale that can generate economic growth (Boopen 2006). These 'general equilibrium effects' of an economy are positively affected by improvements in transportation infrastructure, helping to increase total factor productivity and economic competitiveness on a national, regional and global level (Lakshmanan 2011; Wang 2009).

The impact of well-developed infrastructure on economic growth is exemplified by recent statistics presented by the Global Competitiveness Index, which ranks 144 countries according to their economic competitiveness; and the Logistics Performance Index, a World Bank publication measuring the on-the-ground logistics performance of 155 countries. Through a comparison of both indices, it can be observed that in 2012, eight of the ten most competitive economies in the world also ranked in the top ten of countries with the most advanced transportation industries (Schwab & Sala-i-Martin 2012; Arvis et al. 2012). Aviation represents the fastest growing and most technologically-advanced mode of transportation, carrying over 35 percent of all global trade by value but only 0.5 percent of total volume (Lee et al. 2001; Herdman 2011). The following section will investigate trends in the aviation industry on a global, regional and national scale, and place emphasis on the relationship between air transportation and development.

2.1. Aviation and Development from a Global Perspective

Aviation represents a global industry that has redefined the geography of economic and cultural development. In 1993 few more than 300 airlines carried 22 million tons of cargo and 1.25 billion passengers around the world, airports directly employed around three million people, and 75 percent of the revenue was generated in North America and Western Europe (OECD 1993; Kaszewski and Sheate 2004). Only two decades later, there are more than 1,500 airlines in operation, and airports provide the transactional space for almost three billion travelers and 43 million tonnes of cargo every year (Boeing 2012a; Boeing 2012b; ATAG 2012a; ATAG 2012b). Aviation directly employs roughly nine million people worldwide (56 million in related industries) and, if it were a state, would rank 19th globally in terms of GDP at US$ 539 billion (ATAG 2012a). Between 2009 and 2029 air transportation is forecast to achieve average annual traffic growth rates of 3.7 percent in developed countries and 6.1 percent in emerging economies. Figure 1 displays forecast world passenger traffic growth rates by revenue passenger kilometers (RPK) (Emerson and Leahy 2010). In summary, there is no indication that aviation

growth will slow in the short-to-medium term. While some regions (e.g. North America) will see their share of the global market contract, the global aviation industry is likely to continue experiencing strong growth.

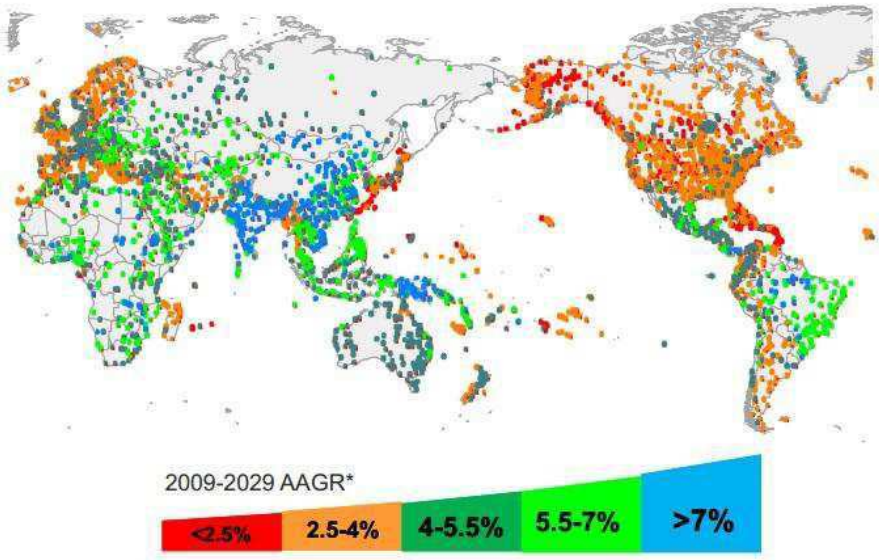


Figure 1. World Passenger Traffic Growth Rates (Emerson and Leahy 2010)

The majority of air-transport development by region is predicted to occur in Asia-Pacific, with an increase of RPK from 27 percent to 33 percent of the global share, followed by Europe (down from 28% to 25%), North America (down from 28% to 20%) and the Middle East (up from 6% to 9%) (see figure 2). Latin America and Africa play a secondary role in the aviation market of today, but are expected to develop rapidly in the future (Emerson and Leahy 2010). Global shares of air traffic volume in the traditionally strong markets of North America, Western Europe and Japan will fall from 45 percent in 2010 to 32 percent by 2029, as markets in developing regions expand. As global demand for air transportation rises, the world fleet of commercial aircraft is likely to double from 15,790 in 2010 to 32,400 by 2029 (Ibid.).

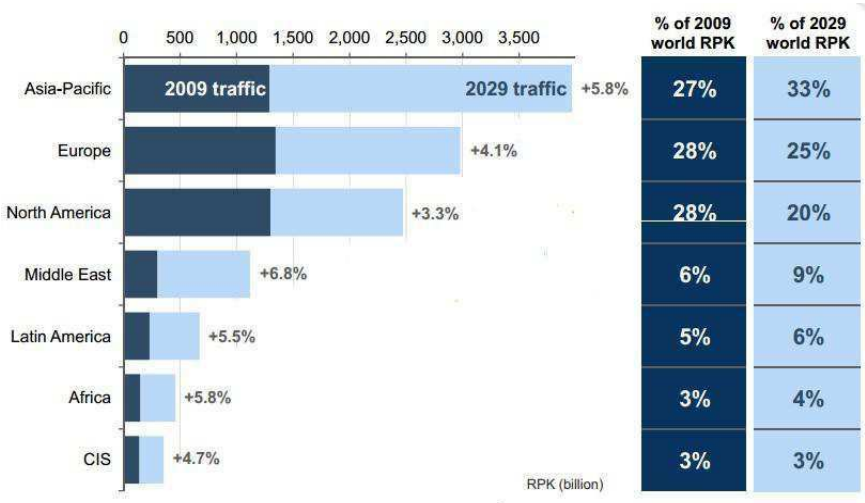


Figure 2. Air Traffic Growth in Percent (Emerson and Leahy 2010)

2.2. Aviation and Development from a Regional Perspective

The Asia-Pacific region is forecast to continue hosting the highest growth rates in aviation traffic globally. Some estimates indicate that by 2025, the flow of passenger and cargo will be three times greater than current volumes in this region (NTZE 2009). A large share of this growth will occur in the emerging economies of Southeast Asia as the result of a number of regionally-specific factors including; deregulation of the aviation industry and the emergence of low-cost carriers, growth of the middle class in a context of rapid urbanisation, continued investment in a tourism sector with a significant potential for expansion, and the persistence of export-oriented economic structures (Emerson and Leahy 2010; Karim et. al. 2003). When combined these factors result in an increasingly strong regional demand for the movement of goods and people (Karim et. al, 2003). The following section will examine each of these processes individually to assess their role in the growth of the Southeast Asian aviation industry.

Deregulation and the Emergence of Low-Cost Carriers (LCCs)

The Action Plan for Air Transport Integration and Liberalisation 2005-2015 and the ASEAN Roadmap for Integration of the Air Transport Sector provide the framework for deregulation and liberalisation of air transportation in Southeast Asia, with the stated objective of achieving an ASEAN-wide Single Aviation Market (ASAM) by December 2015 (ASEAN 2004; ASEAN 2011; Thomas et al 2008). The goal is ambitious when compared to other single aviation markets in, for example, the European Union, where the process took over three decades supported by the guidance of a 'centralised regulatory structure' (Thomas et. al. 2008; 17). In contrast, the 'ASEAN Way' (see chapter 4) affords members a degree of autonomy with regard to the rate and structure of implementing aviation policies. The prevalence of successful sub-regional agreements illustrates the capacity and willingness of member-states to reform aviation policies, even in the absence of region-wide binding agreements. These include the Multilateral Agreement for the Liberalisation of Passenger Air Service between Singapore, Thailand and Brunei, and the CLMV Agreement between Cambodia, Lao PDR, Myanmar and Viet Nam (Thomas et. al. 2008).

The underlying motivation behind deregulation argues that by removing restrictions, customers are provided with more choice, in turn ensuring that providers continually strive to provide the best services available within highly competitive markets. This practice results in innovation and an increasingly efficient use of resources (Button and Taylor 2000). Thomas et. al. (2008; 129) concisely summarize that liberalisation "*...leads to the reduction of trade and investment barriers, simplification of regulations and the development of the relevant institutional and physical infrastructure and human resource capacity in each nation.*" Furthermore, the hidden transaction costs associated with inefficient regulatory regimes are detrimental to regional trade (Sheperd and Wilson 2009). The domestic deregulation of the United States aviation sector in the late 1970s was initiated on similar principles

and resulted in a substantial growth of the industry — benefiting consumers and producers in many sectors of the economy (Button and Lall 1999).

Transportation networks are an integral part of the ASEAN economy as they support production, consumption, and distribution within a region that is economically dependent on its ability to trade both regionally and internationally. The ASEAN transport policy views any improvement of the network, whether it be physical, procedural or organizational as beneficial to the region (ASEAN 2004). For example, bilateral liberalisation agreements between Thailand and Malaysia resulted in the creation of over 8,600 new jobs and generated an estimated 114 million USD (Thomas et al. 2008). If similar policies were adopted region-wide, it is estimated that liberalisation would be worth approximately one billion USD a year spread throughout the ASEAN economy (ibid.). In the longer term, efficient transportation networks can also support the emergence of higher value logistics chains in the region. However, the different stages of development (from low income to high income) experienced between states in the ASEAN may allow some members to benefit more than others (see chapter 4). The "*...rate of growth is highly dependent on issues such as economic diversity, the financial viability of national carriers and the availability of airport and tourism infrastructure* (Thomas et. al. 2008; 129).

Processes of liberalization and deregulation in the ASEAN have also opened the aviation market to new competitors, contributing to the successful expansion of low-cost carriers in the region (LCCs). Despite competing with established regional airlines, the upstarts are motivated by a share of the eight billion USD net profits generated by the industry in 2010 (Herdman 2011). LCCs are airlines that strive for cost-leadership, flying passengers at substantially lowers fares than conventional carriers. Their 'no frills' approach is characterized by operating on a point-to-point route principle (rather than maintaining hub-and-spoke networks), a focus on short-haul flights, and reduced on-board services (Damuri and Anas 2005). Seven regional LCCs have been established in the past decade, increasing competition and reducing airfares across Southeast Asia (Parker 2012). In combination with the emergence of a new middle class, rising incomes, innovative payment schemes (such as paying in installments), and online/SMS booking, LCCs now enable millions more people to fly that previously would have travelled by land, sea or not at all (ABS-CBN 2011). While traditional carriers such as Singapore Airlines, Thai Airways International and Malaysia Airlines still account for the bulk of passenger revenue in Southeast Asia and continue to record annual growth rates of up to eight percent; budget airlines such as Nok Air (Thailand), Cebu Pacific Air (Philippines) and Air Asia (Malaysia) have attained double-digit growth rates of over forty percent in recent years (Schetzina 2012).

Growth of the Middle-Class and Urbanization

Demographic and economic dynamics constitute the second pillar of processes that support the rapid growth of aviation in Southeast Asia. Advances in development and poverty alleviation have led to a growing middle class and increased consumption (see chapter 4). The Asian Development Bank published a study indicating that the proportion of middle-income households in Southeast Asia increased from 21 percent in 1990 to over 56 percent in 2008 (Andrew and Yali 2012). As incomes have risen, spending habits have changed from "...*subsistence to consumption*...", most notably with expenditures on recreational services and a six-fold increase in spending on transportation-related services (Oizumi 2010; 14). At the same time, East Asia is experiencing some of the highest rates of urbanization in the world, with the combined ratio for Southeast and East Asian countries expected to rise from 48.8 percent in 2010 to 74.4 percent by 2050 (Oizumi 2010). Average household incomes in cities of emerging economies are beginning to resemble those of developed nations, or display at the least a noticeably higher level of income in comparison to rural and peri-urban areas in their respective countries. These urban centres also function as business, industrial, and logistics clusters, with the frequency of flows between them growing alongside their individual expansions. Combined, these two factors have spurred the strongest growth of revenue per passenger kilometers (RPK) ever experienced in Asia, which Airbus directly attributes to the growth of 'megacities' (Emerson and Leahy 2010).

The Tourism Sector

The tourism industry in Southeast Asia has experienced tremendous growth rates over the past two decades. Between 1990 and 2011, tourist arrivals more than tripled from 22 million to 81 million, and are expected to rise well over 90 million in the coming decade. (UNESCAP 2009; ASEAN 2011, ASEAN 2012). In 2010, international arrivals represented 53 percent of the market, with regional travel inside Southeast Asia accounting for the remaining share (ASEAN 2011). As a result, tourism has emerged as one of the main pillars of the ASEAN economy, contributing to almost five percent of total regional GDP (10.9 percent including wider economic effects) and providing employment for over 25 million people (WEF 2012). Acknowledging the significance of this industry for economic and social development, the 2001 ASEAN Tourism Agreement (ATA) and 2004 Roadmap for Integration of the Tourism Sector sought to facilitate the process of travel by reducing restrictions, enhancing mutual assistance and human resource training, and providing more favorable investment opportunities for public and private sector engagement (Wong et al. 2011). The 2010 ASEAN Tourism Strategic Plan synthesizes these objectives and explicitly states that enhanced connectivity, increased conservation of natural and heritage sites, and the provision of higher-quality services as preconditions to sustainable development. In the documents tourism is seen as an engine for economic growth, a tool for cultural understanding and a means of income based on the preservation of natural capital (ASEAN 2011).

Export-oriented Economies

ASEAN's outward-orientation to trade and investment has been one of the main factors of the region's economic success (Plummer and Chia 2009). In particular, the automotive and electronics industries have created vibrant export sectors that compete with China and South Korea. The ASEAN has profited from its diverse manufacturing network, comparably low wage levels, and strategic position in transport networks that provide access to some of the world's largest markets (Okun et al. 2010). In 2009, close to three-quarters of ASEAN trade revenue was generated from outside the region (ASD 2011). The ASEAN has signed a number of free trade agreements with Japan, Australia, India China, and other states to strengthen existing trading partnerships (Okun et al. 2010). The export-oriented structure of many Southeast Asian economies is challenged by the low-availability of skilled labor, absence of regional production standards, erratic consumer markets and inadequate physical infrastructure (Mikic 2009). To overcome these challenges and reduce dependency on volatile international markets, ASEAN has emphasized the need for regional trade facilitation. This is associated with a wide variety of policies that lower the cost of trading products and services within the region. On the one hand, the policy addresses broad concepts of good governance, institutional transparency and physical infrastructure development, while on the other hand, more specific measures including reduced tariffs, simplified customs procedures, and the protection of intellectual property rights are emphasized (ADB 2008). Recent studies have shown that ASEAN economic output would increase substantially if trade facilitation measures are implemented on a large scale, with some proposing that investments in information systems and transportation infrastructure would experience the greatest returns (Sheperd and Wilson 2009).

2.3. Aviation and Development from a National Perspective

Viet Nam's strong economic performance has provided the foundation for a dynamic aviation market (see chapter 4). The civil aviation sector has experienced annual average growth rates of 11.7 percent over the past thirteen years, with passenger volumes growing from five million in 1998 to over 25 million in 2011 (AA 2010; IV 2009; AL 2012). The air cargo sector has experienced similar success: between 2000 and 2007 total freight to and from Vietnam increased by an average of 17 percent each year (ICE 2011). In more recent years, cargo growth has neared the twenty percent mark, with the sector transporting a total of 460,000 tons in 2010 (Anh 2011a). This makes Vietnam the third fastest growing market in the aviation industry globally for both international passengers and cargo, as well as the second fastest growing market for domestic passengers (IATA 2011). As an increasingly popular tourist destination (ranked fourth globally in terms of tourism growth), the Vietnamese government has plans to increase to passenger numbers to over sixty million by 2020 (NTZE 2009). However, these projections may prove conservative as market liberalization has only begun recently and the LCC market penetration rate (as the airlines sector with the highest growth potential) remains

comparably low at around nineteen percent (AL 2012). As a result of the strong growth, the Vietnamese government has identified aviation as a top priority sector for development. This includes large-scale investments in airport infrastructure and fleet expansion (NTZE 2009).

Airports

Airports in Viet Nam operate under the jurisdiction of the The Civil Aviation Administration of Viet Nam (CAAV), which represents a branch of the Ministry of Transport. This administrative body regulates the country's aviation industry and is responsible for the formulation of policy to develop commercial air transport, environmental protection, flight management, and safety (ICE 2011; UKTI 2011). Originally, the CAAV was divided by region in the Northern, Middle and Southern Airports Corporations, but has recently been replaced by the Airports Corporation of Vietnam (ACV), a state-owned company that merged all sub-regions into one organization (ICE 2011; CAAV 2012). Viet Nam oversees a total of twenty civilian airports, of which seven serve international routes and thirteen are reserved for domestic use. Of these, only the three largest airports of Tan Son Nhat (Ho Chi Minh City), Noi Bai (Ha Noi) and Da Nang maintain international routes on a regular basis and together account for eighty percent of airline traffic (UKTI 2011; AA 2010).

Almost all airports in the country were originally built prior to 1975 and are in need of modernization (NTZE 2009). To fund these projects, the Vietnamese government plans to invest around USD three billion on upgrading existing facilities within the next three years, and another USD 2.7 billion for greenfield projects between 2016 and 2020. This will increase the number of airports in the country to 26 by 2020, ten of which will operate internationally, with total passenger capacity expected to rise to 120 million by the same year (ibid.). Most of these projects will be financed by combination of the Vietnamese state, foreign investment and overseas development aid (Denslow 2012). Among these, the most ambitious aviation-related project is Long Thanh International Airport. Located forty kilometers from Ho Chi Minh City, this airport metropolis will be home to 770,000 people and cover an area of 5000 ha. Its annual capacity is expected to reach 100 million passengers and five million tons of cargo by 2020, contributing three percent of national GDP (Nguyen 2009). However, due to the financing challenges associated with the immense scale of the project, it remains to be seen how and when it will be realized.

Airlines

Five commercial airlines operate under the Vietnamese flag: Vietnam Airlines, Vietnam Air Service Company, Jetstar Pacific Airlines, VietJet Air, and Air Mekong. With more than 300 scheduled takeoffs per day, Vietnam Airlines represents the principal carrier of the country and accounts for eighty percent of domestic traffic and forty percent of international flights (Minh and Raybould 2011; Anh 2011a). Formed in 1989 as a state-

owned airline, the company currently operates 75 aircraft and is seeking to increase its aircraft fleet to 110 by 2015 (ICE 2011; Minh and Raybould 2011). Vietnam Air Service Company is a subsidiary of Vietnam Air that connects Ho Chi Minh City with the Southern Provinces. Specializing in charter flights, search and rescue, oil platform flights, as well as operation support services, the company may soon be transformed into an LCC (Anh and Triet 2012).

Jetstar Pacific Airlines, the second largest carrier in Vietnam, is the first joint-venture aviation enterprise in the country and is part-owned by Vietnam Airlines (70 percent) as well as Australian Qantas Group (30 percent) (Anh and Triet 2012). It holds approximately fifteen percent of the domestic market and, as Viet Nam's first budget airline, connects the urban centers of Hanoi, Da Nang and Ho Chi Minh City. Its fleet of seven aircraft will be expanded to fifteen by 2014 (Anh 2011a; Anh and Triet 2012). Founded by T&C Holding, Sovico Group, HD Bank, and a number of individual investors, VietJet Air represents the first privately-owned airline of Viet Nam (AL 2012; Anh 2011a). The airline was launched in December 2011 after a five-year implementation phase and competes directly with Jetstar Pacific Airlines in the low-cost air travel market (AL 2012). Air Mekong, the fifth carrier of the country, was launched in October 2010 and services about seven percent of the domestic market (Anh and Triet 2012; AL 2012).

2.4. Concluding Remarks Aviation and Development

The growth of aviation in Southeast Asia, and its strong correlation to economic growth, has often lead to social and environmental spillovers being overlooked. However, as one of the most vibrant sectors of the global economy, the aviation industry presents an ideal context for the application of sustainable development practices and models (Longhurst et al. 1996). Despite advances in sustainability within most major economic sectors, consensus and application of sustainability in the aviation industry has not been uniform. Lack of agreement has resulted in differing interpretations of the principles of sustainable development, as well as different perspectives on the application of sustainability to the aviation industry. While environmental researchers, urban planners and industry management agree that aviation development should not occur haphazardly, but instead be the target of careful planning, the experience of airports around the world suggests that many projects are designed with a short-term perspective of meeting near-future demand — a perspective that may often neglect the social and environmental costs.

3. AVIATION AND SUSTAINABILITY

Commercial aviation provides a physical link between countries, regions and markets, enabling the movement of goods and people at a speed that is unmatched by any other mode of transportation (ICAO 2012). As a result, the aviation industry plays an increasingly important role in many people's lives and society in general. It is associated with a wide range of socio-economic benefits, but has also been subject to criticism due to a number of negative environmental and social impacts. The following chapter will begin by examining the global impacts of the aviation industry, paying specific attention to the challenges it presents to sustainable development. The focus will then shift to the local level, exploring the role of airports in the aviation industry and their relationship with sustainable development. Mainstream models of airport development will subsequently be presented and assessed within a sustainability framework with regard to their applicability to a developing country context.

3.1. The Global Impacts of the Aviation Industry

The global economic impacts of the aviation industry are substantial. It is estimated that the combined value of its direct, indirect, induced and catalytic impacts reached $2.2 trillion in 2010, which is equivalent of 3.5 percent of global GDP. Similarly, 35 percent of global trade by value is transported by air, making one in four companies dependent on airfreight to reach markets (BS 2008; Herdman 2011). In the context of the tourism industry, the link between aviation and economic development is exemplified by the fact that 51 percent of all tourists travel to their holiday destinations by air, supporting over 36 million jobs in developing countries alone, and generating US$ 223 billion in revenue (ICAO 2011a; ATAG 2012b). With more than 4,000 airports around the world serviced by 1,500 airlines, it is possible to reach eighty-percent of all urban areas with no more than two connections, fostering process of world economic integration and globalization (ATAG 2012b). In sum, the aviation industry has a beneficial impact on sustainable development by creating employment, fostering trade and tourism, and enhancing freedom of mobility and cultural exchange.

The positive relationship between economic growth and sustainable development is illustrated by the Environmental Kuznets Curve (EKC). It posits that during the early stages of industrialization, environmental degradation and resource exploitation increase due to the utilization of inefficient technologies and a focus on material output. With rising levels of income and economic progress, this trend reaches a turning point, and eventually reverses as a result of technological modernization and a higher valorization of the environment (Haukioja 2007). Following an inverted U-shaped function, environmental sustainability is therefore highest at the pre- and post-industrial stages of development (Stern 2001; Yandle et al. 2002). While the EKC represents an

oversimplification of processes of development, it provides a useful comparison for the evolution of the aviation industry in becoming more sustainable.

Since the 1960s, technological improvements in aerodynamics and engine efficiency have lowered fuel consumption of commercial airliners by seventy percent (ATAG 2012b). Jet engine manufacturers are collaborating with airlines around the world to introduce sustainable alternative fuels derived from biomass in order to decrease greenhouse gas emissions (Jatropha, Camelina or Algae) (ICAO 2012). With successful tests in scheduled passenger flights reinforcing the expectation that biofuels will be more commonly used within the next decade (OECD 2012). Other sustainability measures gradually adopted by the aviation industry include improved flight route and air traffic management; load factor increases; more efficient ground handling mechanisms; waste reduction and recycling; as well as regular aircraft fleet upgrades and renewal (ATAG 2012b; LH 2012; OECD 2012). The industry's commitment to reduce dependency on volatile oil markets, lower costs and the achievement of green growth is further exemplified by their pledge to improve fuel efficiency by 1.5 percent annually, reach carbon-neutral growth by 2020, and decrease their carbon footprint by fifty percent within the next four decades (in relation to the 2005 baseline) (ICAO 2011a).

Despite these advances, commercial aviation currently contributes an estimated 2 percent (ATAG 2012b) to 3.5 percent (IPCC 1999) of all man-made CO2 emissions; a problem exacerbated by the global warming potential of aviation which often exceeds that of other industries. This is due to the operation of most aircraft at altitudes of between 30,000 to 40,000 feet in the lower stratosphere, where radiative forcing triples the damaging effect of greenhouse gas emissions (Whitelegg and Cambridge 2004; OECD 2012). At the regional level, emissions from jet engines and industrial activity (as potentially stimulated by airport development) can increase the level of harmful pollutants found in air, water or soil. Chemical reactions of these pollutants can form highly corrosive substances with the potential to, amongst others, damage human health, decrease agricultural productivity, and lead to the acidification of rivers and lakes (OECD 2012).

The environmental costs of the aviation industry mentioned above are by no means exhaustive and highlight the nature of air transportation as an industry impacting and impacted by a wide range of actors present at all spatial scales (local, regional and global). In the broadest sense these include users (passengers and cargo); the population as a whole (residents, employees; unions); governments and organizations (e.g. ICAO, UN and FAA); manufacturers (engines, fuselage, other aircraft components); and energy providers (OPEC and refiners) (Chrisman et al. 2011). To address this complexity, various organizations and academic researchers have proposed definitions of sustainability and its relation to the aviation industry:

> - The Organization for Economic Co-operation and Development (OECD) was among the first to present a definition, stating that "... *sustainable transportation is one that does not endanger public health or ecosystems and that meets needs for access consistent with (a) use of renewable resources at below their rates of regeneration, and (b) use of non-renewable resources at below the rates of development of renewable substitutes...*" (OECD 2001, 18).
>
> - The Air Transport Action Group (ATAG) presents a similar definition describing sustainable mobility as "*...the ability to meet society's need to move freely, gain access, communicate, trade and establish relationships without sacrificing other essential human or ecological values, today and in the future...*" (ATAG 2002, 9).
>
> - One of the most recent definitions of sustainable aviation is provided by Chrisman et al. (2011, 1), who stress that "*...the aviation system can be considered sustainable if it equitably balances inherent trade-offs between economic and social development and environmental degradation in terms of measures associated with the system actor categories [...] over near, short and long time periods across local, regional and global geographies while continuing to provide economic and social opportunity by facilitating trade and the exchange of knowledge, without creating undue environmental damage...*"

The distinguishing factor of the three definitions is their scope; while the OECD and ATAG emphasize the social and environmental components of sustainability, Chrisman et al. (2011) add considerations of sustainable economic growth. From this perspective, the potentially adverse social and environmental effects associated with air transportation can be reconciled through economic growth and poverty reduction, fostering technological improvements and longer-term sustainability in the industry and beyond. Each definition presents a valid basis from which to begin the discussion of sustainability and air transport, however, the absence of government and private sector consensus on the definitions and principles of sustainable aviation, impedes meaningful progress.

At a local level the diversity of approaches to sustainable aviation results in a multitude of different outcomes. Aviation-related infrastructure generally impacts land-use and the composition of the surrounding environment. Airports, with their runways, terminal buildings, service areas, car parks and road networks are strong drivers of urban sprawl, transforming large tracts of countryside into anthropocene zones (generally categorized into paved, built, or mown grassland). This reduces ecosystem services, causes the destruction of animal habitats, and leads to biodiversity loss (Upham et al. 2003; Whitelegg and Cambridge 2004; OECD 2012). A second commonly-found externality in communities next to airports around the globe is noise pollution. More than 30 million people experience noise pollution emanating from airport-related activities on a daily basis

(ICAO 2001). With sound pressures of up to 110 decibels during takeoff and landing, aircraft noise represents a serious health hazard and can induce stress, sleep deprivation, impaired hearing and cardiovascular disease (Li N.d.; Whitelegg and Cambridge 2004). The following section will delve deeper into the relationship between airports, development and the communities in which they are located.

3.2. Local Impacts of the Aviation Industry: Airports

In the narrowest sense, airports represent man-made structures designed for the departure, arrival, movement and maintenance of aircraft. They accommodate the facilities that link air and ground transportation, and make possible the transit of people and cargo from one place to another (van Oortmerssen 2008). Over the past century, airports have evolved from isolated runways to multi-faceted transportation hubs, representing key drivers of global productive integration and cultural exchange (Freestone and Baker 2011). As spaces of flows, they provide the transactional space for over 3 billion passengers and 48 million tonnes of cargo annually, and frequently embody: "*...the most important, single piece of infrastructure in the battle between cities and nations for influence in, and the benefits of, growth and development.*" (ATAG 2012b; Freestone 2009, 163). Privatization in the aviation industry, internationally-managed supply chains, 'just-in-time' global manufacturing, high demand for urban land, increasing importance of logistics and e-commerce, as well as the emergence of a strong tourism sector have all reshaped the ways airports are organized and operated (Schaafsma 2008; Freestone and Baker 2011). As a result, airports today attract a wide array of commercial activity, whose demand for aviation-related infrastructure creates a generic landscape of mixed-use urban zones (Freestone 2009).

Between 1990 and 2007 revenues from non-aviation commercial activities at airports increased from thirty percent to 57 percent, turning airports into logistic economic zones and national economic gateways (AI 2007). This process has been captured increasingly by scientific literature dealing with airport design and management (Horonjeff and McKelvey 1994; Ashford et al. 1997; De Neufville and Odoni 2003; Wells and Young 2004). As commercial activities have grown and diversified, so have the impacts of airports on the communities by which they are located, leading to the academic exploration of the local impacts of airports. The earliest publications investigating environmental impacts, site selection and location conflicts can be traced back to the 1970s (Haggett 1979). Sustainability and airports have also been linked in more recent literature, but without the emergence of a clear framework or definition of a sustainable airport (Longhurst et al. 1996; Kaszewski and Sheate 2004; Charles et al. 2007; Freestone 2009). Most studies are placed within the context of major airports in developed countries and emphasize macro-economic impact analysis, with limited reference to the socio-economic impacts of airports on related communities in developing countries.

The following section will present the mainstream models of airport development, and compare these to examine how a more holistic model of sustainability can be developed. Where possible, a model's inclusiveness of people, planet and profit with the objective of maximising global benefits and minimizing negative local impacts will be emphasized. With countries like China investing around USD 240 billion on 56 new commercial airports over the next five years, India constructing twenty new airports and renovating 58 more, and the Middle East investing USD 104 billion in coming years the impacts of these investments will continue to persist for decades (Kasarda 2012). If these developments are approached with careful planning and a long term perspective, they have the potential to support sustainable growth. If not, the haphazard construction of short-term solutions may limit sustainable outcomes and negatively the communities in which they exist.

3.3. Models of Airport-Driven Urban Development

The ever-increasing complexity of the airport landscape has been conceptualized in academic discourse by several overlapping, nonetheless distinct models of airport-led urban development. These include the airport city (Penada et al. 2010), the Aerotropolis (Kasarda 2006), the airfront (Blanton 2004), the cityport (van Wijk 2007), the airport corridor (Schaafsma 2008), the Aviapolis (CI 2009), and the 'Airea' (Schlaack 2009). Each model can be distinguished by the processes they encompass — from core-aeronautical activities, to airport-related activities, and airport-oriented activities — as well as geographic scope — from just outside the fence to the greater metropolitan region (van Wijk 2007; Kasarda 2010). In this context the study of airports has progressed in concert with the organizational and technological advancements achieved and challenges encountered by the aviation industry for more than a century.

This evolution has been captured by a wide array of increasingly sophisticated and scientific literature dealing with airport design and management (Horonjeff and McKelvey 1994; Ashford et al. 1997; De Neufville and Odoni 2003; Wells and Young 2004). The earliest publications regarding environmental considerations in the context of site selection and location conflicts can be traced back to the 1970s (Haggett 1979), from which sprang the more recent writings on sustainability issues and security (Upham and Mills 2005; Wheeler 2005; O'Malley 2006). With airports representing the interface between local environments and global forces, their goal is to bring about a more balanced and comprehensive approach to airport development (Robertson 1995). This includes the establishment of indicators, benchmarks, and normative objectives to be incorporated in governance and management mechanisms of the aviation industry. The following section will present the most commonly referenced models of airport-driven urban development.

The Airport City

As one of the earliest models, the concept of an airport city began to gain recognition in the 1970s. Initially it denoted the agglomeration of businesses and industry in the direct proximity of major airports, yet has failed to provide a universally accepted definition (Penada et. al. 2010). Urban planners view the airport city as a *"…spatial manifestation of the interaction between airport-centered commerce, real estate development, and multi-modal transportation…"* with all the qualitative features of an urban area (Penada et al. 2010, 2). Economists, by contrast, do not take into account the urbanizing aspects of airport development, but rather frame the airport city as a cluster of aviation-related commercial activity (Penada et al. 2010; Freestone and Baker 2011). Airport operators, in turn, relate to the concept of the airport city as a business strategy to attract investment and reduce risk (Reiss 2007; Timbrell et al. 2006). The airport city can be identified by the presence of four types of commercial development: retail malls by terminals, office buildings, freight facilities, and leisure/health services (Freestone and Baker 2011).

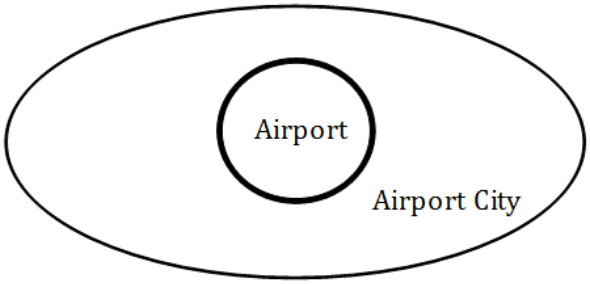


Figure 3. Conceptual Model of the Airport City.

The Airfront

The airfront model represents an extension of the airport city's commercial system, located adjacent to the airport itself. It is dependent on aviation infrastructure to access markets, provide competitiveness, and benefit from technological clusters. Commercial districts formed by the airfront are integrated into global supply chains, and "*...contain more income-generating economic activity than traditional downtowns or suburban office parks…"* (Blanton 2004; 34). In contrast to the airport city, where real estate development and commercial activity are regulated by the airport authority, the airfront is organized through a combination of local community and private-public partnerships (Schaafsma 2005; Blanton 2004). The model emphasizes that the haphazard growth of clusters in the vicinity of the airport can negatively impact sustainable development in the absence of "*...a district-wide comprehensive plan [...] for organized land-use, environmental and transportation systems..." [...],"...a governance framework [...] between public agencies and private industry..." ,* and *"...a shared sense of responsibility..."* between stakeholders (Blanton 2004; 35).

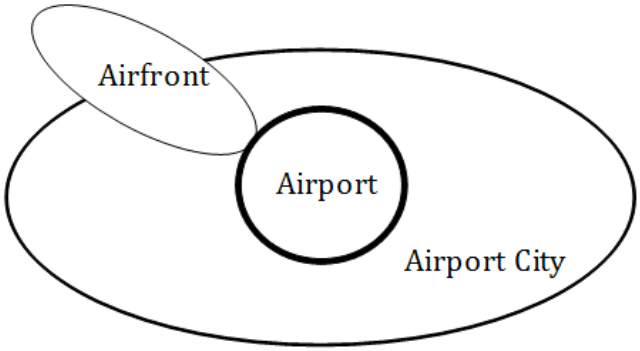


Figure 4. Conceptual Model of the Airfront.

The Aerotropolis

The aerotropolis model eclipses the airport city and airfront models both theoretically and spatially, and is positioned in what has been labeled the fifth wave of urban development. Each wave is related to a primary mode of transportation in different time periods as central drivers of economic growth: the first saw the flourishing of cities around seaports; the second wave pushed settlements inland along major waterways; the third wave resulted from improved railroad linkages (spurring industrial production in the periphery); the fourth wave created a dense highway system associated with the dispersion of people and businesses to suburban areas; while the fifth wave experienced a rapid increase in the utilization of air transportation and the relocation of many industries close to centers of aviation-related infrastructure (Derewicz 2011). In this context airports have evolved to assume many of the commercial functions of central business districts (CBDs) and traditional retail centers, drawing a wide variety of both aviation-oriented as well as non-aviation-related activities. With the airport city at its core, the aerotropolis has become a catalyst of regional development, economic growth and globalization (Kasarda 2006; Freestone and Baker 2011). Examples of aerotropoli include Memphis International Airport, which, as the world's largest cargo aviation facility, extends across five post codes and generates over $28 billion in annual revenue and 220,000 jobs (Prosperi 2007; BF 2010). Similarly, the impact of Dallas/Fort Worth International Airport grew from $8.5 billion in 1995 to $39 billion in 2011 (Krul 2011); while Chicago O'Hare Airport and the adjacent area produce stronger economic growth and employment figures than the CBD of Chicago (Freestone and Baker 2011).

The metropolis-airport dynamic is illustrated by areas within an eight kilometer radius of major airports "*...adding jobs considerably faster than suburbs at similar distances from a metropolis's center, but not near an airport* (Kasarda 2006; 2)." Unlike the airport city and airfront, aerotropolis growth is stimulated by the private sector and employment, including residential projects to emulate the functionality of an actual city (Freestone and Baker 2011; Kasarda 2011). Airports therefore assume the characteristics of an urban area, including a similar density of transit connections, communications infrastructure,

corporate clusters, and service availability (Kasarda 2011). To date aerotropoli have emerged largely through a process of organic growth, creating several negative social and environmental externalities. Similar to the previous models, the aerotropolis recognizes the importance of long-term planning by "...*bringing together airport planning, urban and regional planning, and business-site planning in a synergistic manner so that future aerotropolis development will be more economically efficient, aesthetically pleasing, and social and environmentally sustainable* (Kasarda 2012)." Kasarda emphasizes this point by stating that "...*the real question is not whether aerotropoli will evolve around major airports (they surely will). It's whether they will form and grow in an intelligent manner, minimizing problems and bringing about the greatest returns to the airport, its users, businesses, surrounding communities, and the larger region it serves"* (Kasarda 2012).

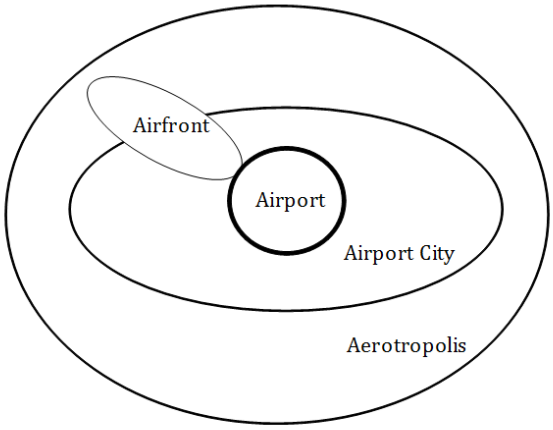


Figure 5. Conceptual Model of the Aerotropolis.

The Cityport and Airport Corridor

While in theory the aerotropolis does not have specific spatial requirements and can occur both independently of, and in close proximity to large cities, the cityport model is firmly integrated within the urban context. It relies on the existence of transport infrastructure such as roads and rail to create an environment favorable to property development, and adopts an approach known as 'exploit the site' (van Wijk 2007). Contrary to logistics and maintenance, which represent the core business of an airport, this framework gives priority to commercial development with the highest value-added, commonly comprising office parks and the service sector (ibid.).

Depending on the airport's size, the availability of land, infrastructure connectivity, and development vision, the continuous growth of cityports and related economic activity can lead to the creation of an airport corridor — linking the airport with the central metropolitan region. Known as the fourth stage of aviation infrastructure development, the airport corridor is characterized "…*by a strategically public-planned infrastructural spine to the inner city and by a functionally-integrated development of rail or road infrastructure and real estate."* (Schaafsma 2008; Schlaack 2009; 116). Private developers, government, and airport

operators are the key actors involved in the planning process (Freestone and Baker 2011). Examples of airport corridors can be found in many metropolitan areas (e.g. Sydney, Australia) that employ tailor-made district planning (e.g. Zurich, Switzerland), and experience large-scale infrastructure investments (e.g. Hong Kong, China) (ibid).

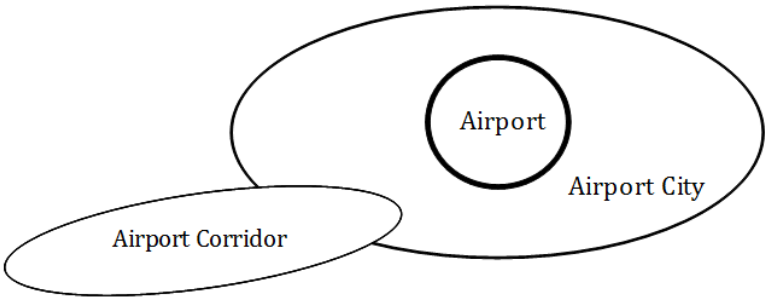


Figure 6. Conceptual Model Airport Corridor.

The Aviapolis and The Airea

Positioned inside the airport corridor, the aviapolis constitutes a development model promoted by Finavia, the airport authority of Helsinki-Vantaa International Airport and four cities of the greater Helsinki metropolitan region. The aviapolis is represented by a set of business and innovation clusters, that generate employment and innovation through close linkages between the city and the airport (CI 2009). With 42 square kilometers of commercial and residential space that support a total of 35,000 jobs, the 'prosperous metropolis' competitiveness strategy presents the aviapolis model as crucial to the sustained growth and competitiveness of Finland in the global economy (ibid.).

A more recent model, the airea, describes *"…various fragmented islands of development within a certain space of opportunity in relation to an airport…"* that can be identified by immense pressures for development and high investment (Schlaack 2009, 117). As a spatial concept, it disaggregates areas affected by the economic and social impacts of an airport into constituent parts and examines these in terms of "…*their physical form, their main stakeholder constellation…"* as well as "…*their interrelation to each other, to the airport and to the city."* (Freestone and Baker 2011; Schlaack 2009, 118). Therein the airea is defined by proximity, accessibility, stage of development, and relation to the airport and metropolitan region, with the objective of developing the sustainable integration of each component. It classifies the relationships between airports and the metropolitan areas as symbiotic, competitive, parasitic, or isolated (Schlaack 2009).

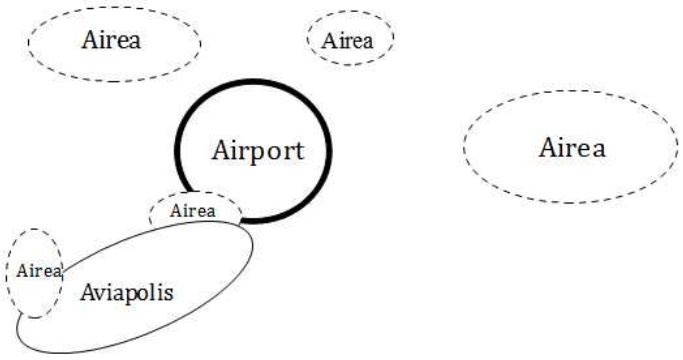


Figure 7. Conceptual Model of the 'Airea' and the 'Aviapolis'.

Models of airport-driven development can be distinguished based on their function and geographic scale. A constant in all models is the representation of the airport as an engine of economic growth, that, depending on its location and size, attracts different forms of spatial and functional development patterns. The individual theories often lend from one another and share similar assumptions, in some cases making differentiation problematic. To address this figure 8 presents the aforementioned models in relation to each other, and by doing so, attempts to visualize the key theoretical differences between the individual models.

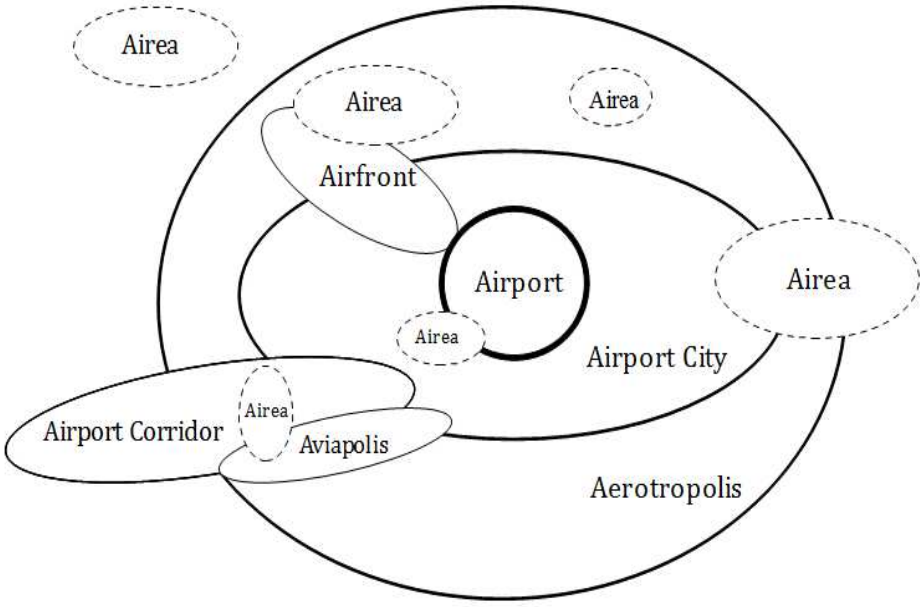


Figure 8. Conceptual Model of Combined Theories of Airport-led Urban Development

Concluding Remarks - Airport Models

Models of aviation-driven urban development are primarily conceptualized within the context of large-scale European and North American airports. This western-centric perspective presents several challenges to the application of these models in middle and low-income countries. Nonetheless, many airport characteristics are shared globally, and can provide useful comparisons for the study of emerging airport developments in Southeast Asia. Of the models presented, the 'Airea' appears the most suitable to support a well-defined study, with tangible indicators of the relationship between local communities and the airports they surround. Figure 9 summarizes the theoretical and spatial dimensions of all airport models presented in this section. While each model captures some aspects of the complex relationship between airports, local communities and the environment, they are limited to observing the impacts where investment and development are already noticeable. In order to foster sustainable development, models should address a triple bottom line of people, planet and profit inclusive of all potentially affected areas. Airports, sustainability and the indicators of progress will be explored in the following sections.

	Definition	Location	Lead Actors	Key Text	Exemplar
Airfront	Airport-related commercial zone	Airport fringe	Local community; private–public partnerships	Blanton (2004)	Metropolitan airports
Airport city	Planned mixed-use development of airport site	Airport land	Airport owner-lessee	Güller and Güller (2003)	Schiphol
Airport corridor	Coordinated provision of infrastructure and commercial development	Airport-CBD axis	Private developers; public infrastructure authorities	Schaafsma, Amkreutz, and Güller (2008)	Zurich
Aerotropolis	Time-sensitive metropolitan scatter of airport-oriented uses	Airport-centered metro	Private market	Kasarda (2000a)	Dallas-Fort Worth
Airea	Discrete spatial clusters of airport-related development	Metropolitan subregion	Private market	Schlaak (2010)	Denver

Figure 9. Models of Airport-Driven Urban Development (adapted from Freeston and Baker 2011)

3.4. Sustainability Framework

The complexity of systems, actors and processes converging at an airport is compounded by the dispersion of impacts over large spatial and temporal scales (Longhurst et al. 1996, OECD 2012, Whitelegg and Cambridge 2004). One approach is to develop unique definitions of sustainability at each airport, through inclusive stakeholder dialogue, that can address local challenges more effectively (SAGA, 2012). For this to succeed a standardized definition of sustainable airports should maintain a minimum adherence to the fundamental principles of sustainable development. Such a definition promotes competition and innovative solutions to industry challenges, encouraging a more widespread transition toward sustainable practices.

Today, sustainability is interpreted in a variety of ways by different stakeholders, resulting in multiple definitions and approaches to sustainable practices in airport operations (ACRP 2011). Of the three most prominent organization's benchmarking the progress of airports, each have separate definitions of sustainability. Global Reporting Initiative (GRI) adopted the widespread Brundtland Commission's definition, while Airports Council International (ACI) defines it as: "*...a holistic approach to managing an airport so as to ensure the integrity of the economic viability, operational efficiency, natural resource conservation and social responsibility of the airports."* (SAGA 2012). The Airport Cooperative Research Program (ACRP) defines sustainability as a "*...broad term that encompasses a wide variety of practices applicable to the management of airports. [...] practices that ensure: protection of the environment, social progress; and the maintenance of high and stable levels of economic growth and employment."* (ACRP 2011; 2). The often-referenced triple bottom line is found embedded in most definitions, with distinct differences often most noticeable the approach to the concepts of people, planet and profit (SAGA, 2102). However, the lack of industry-wide consensus on a clear and applicable definition does not address the central question: can airports be sustainable?

To answer this question, it is necessary to introduce two new concepts to the debate on airport operation and development: weak and strong sustainability. Rooted in neoclassical economic theory, weak sustainability asserts that societal well-being should increase over time without sacrificing natural capital in this process. According to Solow (1993), this implies that technological advances will replace the functions of natural capital over time, and therefore not erode the resource base of future generations in an unsustainable manner. Fundamental to this framework is the assumption that sustainability outcomes can be measured objectively and monetarily (Martinez-Alier et al. 1998; Garmendia et al. 2010). In contrast, strong sustainability advocates the notion that ecological, social and economic types of capital should be conserved independently of each other. This means that nature and its services are unique, non-substitutable, and lost forever if exploited beyond a certain threshold (Brekke 1997). In this context, most publications on the environmental and social impacts of airports can be placed within the weak sustainability spectrum, including fuel efficiency and emission trading schemes (LH 2012); noise abatement (ACI 2009); and waste recycling (EPA 2009).

Longhurst et al. (1996) address the concept of weak sustainability by proposing that considerations of "*...current and future environmental costs..." , "...the equitable distribution of resources within and between nation states..."* and "*...large scale participation in goal setting and decision-making procedures..."* should be integrated as early as the design phase of airports in order to achieve positive outcomes (Longhurst et al. 1996, 198). While the lines between each concept are not always clearly drawn, airport authorities have more recently also attempted to integrate measures of stronger sustainability in their operational practices. These include, amongst others, recycled runway pavements (Pittenger 2011); wetland

protection/restoration (Kasarda 2008; CDA 2o11); local community cooperation (FAA 1990); and renewable energy production (Rowlings and Walker 2008; Lydersen 2012).

To further capture the principles of sustainable airport development, Upham et. al. (2003) present a revised model of airport capacity. Traditionally airport capacity is measured by the volume of passengers, cargo and flights it is able to accommodate. Instead, Upham et. al. (2003; 146) propose that airport capacity should be seen as a "*...function of operational scale, management and environmental constraints"*, with constraints described as the "*...impact of an airport's operation upon the local environment and upon the lives of residents of local communities."* By framing capacity as being limited by economic, environmental *and* social thresholds, the model reinforces the importance of monitoring all impacts of airport operation. From this perspective, strong sustainable processes will reinforce or improve capacity while weak processes will gradually constrain or reduce capacity.

In order to operationalize weak and strong concepts of airport sustainability, Longhurst et al. (1996) prescribe a set of guidelines. These assert that if an airport is able to monitor impacts, publish findings, build partnerships and establish multi-level decision-making structures, it becomes particularly sensitive to the impacts of its operations and development. Based on this rationale, sustainable development is not a static concept, but rather a "*... path of continuous improvement, wherein the products and services required by society are delivered with progressively less negative impacts upon the earth. "* (Cobb and Beloff. 2011; 41). The use of empirical indices to monitor and assess the dynamics involved becomes crucial to establishing a point of origin from which progress is made (Longhurst et al. 1996). Transparent and open measures of sustainability build trust, drive innovation, increase competition and create industry-wide best practices.

A global increase in the number of companies that voluntarily disclose sustainability reports and related materials from 26 in 1992 to more than 3000 in 2008 indicate a positive trend of increased corporate reporting (CR 2009). Last year 95 percent of the world's 250 largest companies published information regarding their corporate social responsibility initiatives (KPMG 2011). The prevalence of reporting indicates a general willingness in the business community to share, at the very least, positive results and their commitments to sustainable development. Lydenburg et. al. (2010) propose the implementation of mandatory third-party reporting in order to increase disclosure and provide the uniformity required for useful analysis. While the associated costs are often a deterrent, mandatory reporting can paint a more accurate picture of progress, inclusive of both positive and negative indicators, to establish minimum thresholds of acceptable performance (Lydenburg et. al. 2010). A system of thresholds can help to identify instances of strong and weak sustainability, and subsequently reinforce strong processes while addressing weak solutions.

Despite trends toward increased sustainability reporting in most industries, the number of airports publishing similar information has only experienced a moderate increase, from around seven in the early 1990s to forty today (GRI 2009). These airports are primarily located in Europe and North America, and to a lesser degree in the big urban centers of Asia/Oceania, while no reports from airports in emerging economies could be found (ibid.). The absence of a comprehensive and universal system of reporting that establishes common standards for qualitative and quantitative data impedes the task of objective and meaningful comparative analysis (GRI 2009; Lydenburg et. al. 2010). This point is corroborated by a recent study examining the CSR reports of over 1000 companies. Due to inconsistent approaches of sustainability assessment, it concluded that findings are frequently not comparable and the overall performance of companies in relation to their peers is often difficult to assess (PwC and CDC 2009). The introduction of a comprehensive benchmarking system could thus help airport authorities learn from the innovations of other airports, which is especially relevant in the context of developing countries where the strongest growth rates of air travel and aviation infrastructure development are expected to occur in coming years .

To date, two attempts have been made to take stock of airport-related sustainability reporting. The most recognized and recent was conducted by the Global Reporting Initiative (GRI), providing a snapshot of sustainability initiatives in airports around the world (Goebel and Derks-Wood 2010). It compiled a total of seventeen publications and identifies sustainability indicators according to how often they are listed in the individual documents. The most common topics included employment, community, health and safety, as well as economic performance; while environmental impacts and supply chain management were mentioned least often (GRI 2009). The second project was undertaken by the Airport Cooperative Research Programme (ACRP) with the objective of compiling an inventory of sustainability-related practices in the airport sector. The respondents consisted of representatives from the respective environmental and social offices of each airport. Based on an online survey, a total of twenty-five questionnaires were obtained from Europe, North America and Asia. They mention increased regulations as the main drivers for the introduction of sustainability measures in airports (ACRP 2008). Nevertheless, findings from both studies do not provide a holistic representation of sustainable airport development around the world due to small samples, a focus on developed countries, and voluntary reporting. As a result, Schlaack (2009; 114) argues that there is an "*...urgent need for a closer scientific attention and a strategic intervention in this often uncontrolled process of airport related growth.*

Concluding Remarks - Sustainability Framework

Recent literature concerning airports and sustainability varies according to the perspective of the author and the spatial scale in which it is framed. Achieving consensus is further complicated by the absence of universally recognized indicators of airport sustainability that facilitate uniform monitoring of progress between airports. While concepts and

models of airport sustainability are still in the (relatively) early stages of development, most views on the subject agree on the importance of a triple-bottom line that recognizes people, planet as well as profit. So what does this mean in a developing country context? The majority of research conducted has been inherently western-centric, with case studies drawn primarily from major European and North American airports. The following chapter redirects the focus from a discussion of global progress to the context-specific determinants of airport development relevant for examining airport-related impacts in Viet Nam. This will include a discussion of the processes of regional integration, air traffic growth, and economic development prescribed by the Association of Southeast Asian Nations (ASEAN).

4. CONTEXTUAL FRAMEWORK

Chapter 2, Aviation and Development, explores the main factors driving the growth of the aviation industry in Southeast Asia (including deregulation, urbanization, tourism and an export-oriented economic outlook). Similar demographic, economic, social, and political determinants are present in Viet Nam. Domestic aviation development is directly subject to these context-specific factors, and increasingly to region-wide processes of socio-economic integration. The following chapter will present the main factors explaining the significant growth of Viet Nam's aviation industry, and discuss reasons why the country is expected to become the world's third fastest growing aviation market by 2014 (IA 2011). As an emerging economy with a rapidly changing socio-economic structure, a distinct political system, and a strong position within an increasingly integrated region, the study of airport development in Viet Nam requires an application of sustainability that is sensitive to the unique circumstances of this setting. The following chapter will examine the demographic, economic and political structures in Viet Nam leading to rising demand for air travel, within the current process of increasing regional integration.

4.1. Country Profile: Viet Nam

Viet Nam is home to 87.8 million people, making it the 13th most populous country in the world (World Bank 2012c). In recent years, the population growth rate has stabilised at around one percent, following several decades of rapid growth in the post-war period. The median age of the population has risen from 18.2 years in 1980 to 28.5 years in 2010. Similarly, life expectancy has increased from 58.9 years to 74.3 years over the same period (Roy et al. 2010). Divided by region, the majority of Vietnamese citizens live in the Red River Delta (20 million), along the coastal regions in the North and South of the country (19 million), and in the central highlands (5 million). This translates to a national population density of 265 persons/km² (World Bank 2012c). Figure 10 presents a map of Viet Nam and neighboring countries.

The highest population densities in the country are found among the metropolitan centers of the Red River Delta (944 persons/km²) and the Mekong Delta (631 persons/km²), where 40 percent of the total population live (MPI 2011). These regions are serviced by the two largest airports in Viet Nam: Tan Son Nhat International Airport in Ho Chi Minh City and Noi Bai International Airport outside of Ha Noi. Combined these two airports carry around 27 million passengers per year, representing 80 percent of all air traffic in Viet Nam (AA 2010; Nhat 2012). There are also seventeen domestic airports spread throughout the country servicing remote regions in the 1650 kilometer span connecting northern Viet Nam to the South (VTO 2008; AA 2010).

The central highlands along the border to Laos and Cambodia represent the most remote regions of the country (97 persons/km²) and are home to more than 53 ethnic minorities. The Kinh majority (84 percent of total population) live predominantly in the lowlands and urban centers (Baulch et. al. 2002). In 1990 there were an estimated 500 urban areas in Viet Nam. Today, this number has risen to over 750, with the majority of urban development occurring in the southern regions of the country (VSGO 2009). Viet Nam's largest urban centres include: Ho Chi Minh City (5.9 million), Ha Noi (2.6 million), Haiphong (1.9 million), and Da Nang (807,000) (CIA 2012). Throughout the 1980s the urbanization rate of Viet Nam stagnated at around 20 percent; significantly increasing after 2000 to reach over 30 percent in 2010 (Ngo 2010). While this is seven percent below the average of Southeast Asia as a whole, the Vietnamese Ministry of Construction estimates that the portion of the population living in urban areas will exceed 45 percent by 2020 (DiGregorio 2011).

Figure 10. Map of Viet Nam and Neighboring Countries (UoT 2001)

The growth of Asian megacities and urban populations is increasing the flow of people and goods between them, and subsequently increasing demand for transportation services (see chapter 2). Connectivity between urban centers improves trade and exchange in economies that are increasingly subject to regional and global markets. In Southeast Asia, air travel represents the fastest and most direct form of transportation between major cities. Using Ha Noi as a point of reference, figure 11 illustrates that the largest cities of Southeast Asia are located within the distance of a short (less than 2 hours) or medium haul (less than 4 hours) flight.[3] Similary, inside of Viet Nam, the most direct route between the two most populous areas of the country (Ho Chi Minh City and Ha Noi) is air travel. In addition, the underdevelopment of road and rail systems throughout much of the periphery has influenced more people to turn to flying as a means of regional transportation.

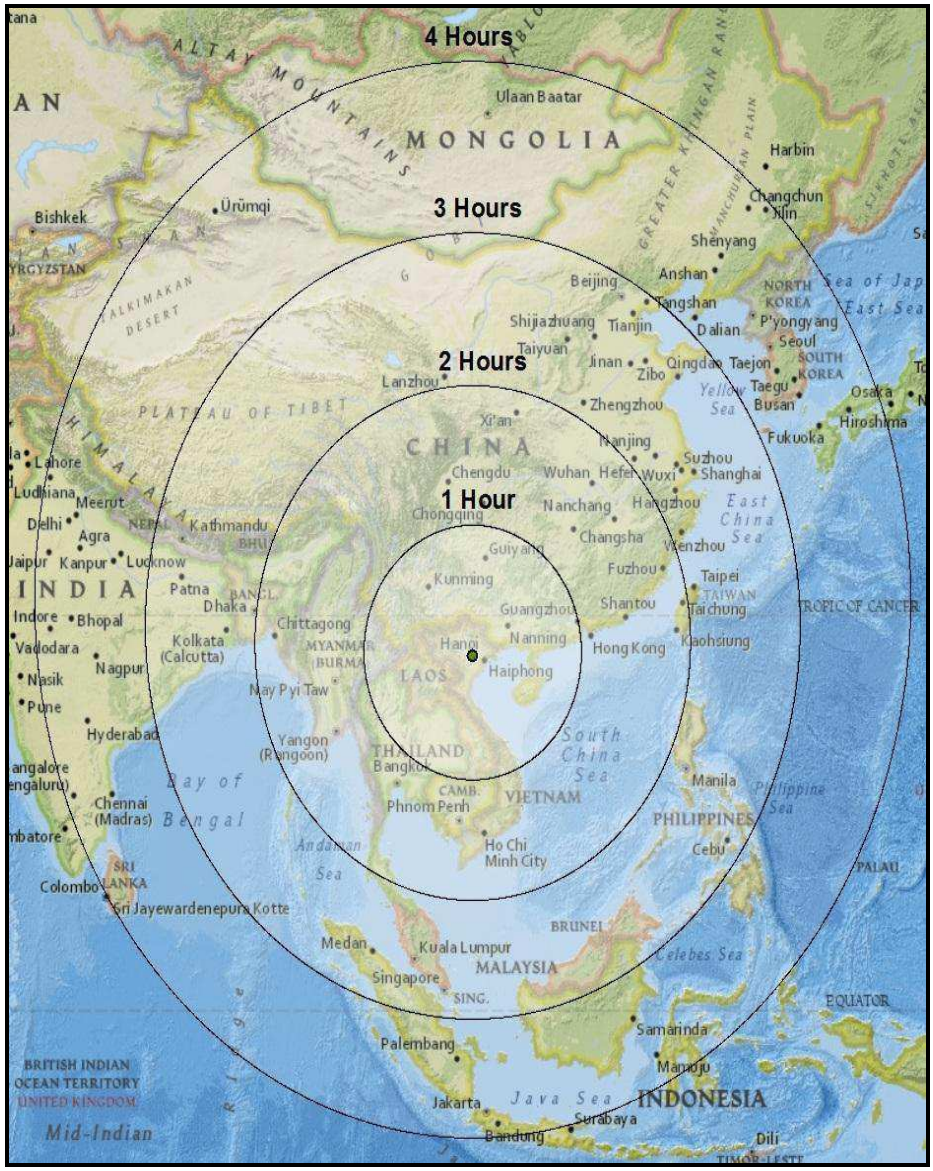


Figure 11. Flight Times from Ha Noi

[3] Examples include Ha Noi - Hong Kong (1h6m) Ha Noi - Bangkok (1h14m), Ha Noi - Ho Chi Minh City (1h26m), Ha Noi - Manila (2h12m), Ha Noi - Singapore (2h45m), Ha Noi - Beijing (2h54m), Ha Noi - Jakarta (3h46m). Times are calculated according to an average commercial airliner cruising speed of 805 km/h. (HMH 2012).

Economy

Increased volumes of air traffic in Viet Nam, as well as within Southeast Asia, have coincided with the strong economic growth present in the region since the early 1990s. More recently, Viet Nam has been described by the World Bank as "*...one of the most dynamic emerging countries in East Asia.*" (World Bank 2012d). This represents a remarkable shift from the once war-ravaged and poverty-stricken country of thirty years prior. Following the reunification of North and South Viet Nam in 1976, the country adopted an economic system characterized by the central-planning typical of Soviet-era socialist countries. An extended period of economic stagnation ensued as a result of inefficient government administration, obsolete modes of production, highly-regulated markets, excessive investments on heavy industries, and a lack of domestic competition; all creating few incentives to reduce dependency on trade with other socialist countries within the Council for Mutual Economic Assistance (CMEA) (Fin et al. 2004). Beyond economic stagnation, the inefficiency of state planning and lack of incentives to improve productivity resulted in decreasing agricultural output. Domestic food production was eventually unable to support domestic consumption, furthering dependence on imports and instigating periods of widespread starvation. From a post-war GDP growth rate of 16.8 percent in 1976, by 1980 the Vietnamese economy was in serious decline (ibid.).

The communist party was forced to respond with limited reforms under a model known as the modified planned economy. Central to the reforms was the formal acknowledgement of entrepreneurs operating outside the defined boundaries of the planned economy. These 'fence-breakers' (manufacturing sector) and 'illicit contractors' (agriculture) proved so crucial to production that their operations were legalized. For the first time economic activities outside of officially endorsed state-planned enterprises became institutionalised (UN 2005). Despite reduced financial support from the CMEA, the reform initiated a period of strong economic growth in the first half of the 1980s that gradually lead to agricultural self-sufficiency (Fan et al. 2004; Forbes 2008). However, fundamental problems such as trade imbalances, poor resource allocation and ineffective government subsidies were not addressed, and soon food shortages, skyrocketing inflation rates, and a severe recession returned. In 1986, out of a dire need to find solutions to the crisis, the Vietnamese state formally "*...recognized the existence and the essential role of a multi-ownership structure in Viet Nam's economy.*" (UN 2005, 55). This represented a turning point in Viet Nam's economic policy and heralded the start of a new era known as *Doi Moi* (Renovation).

With the implementation of comprehensive market-oriented reform in 1986, the government sought to liberalize trade, enhance competition, provide more freedoms for people and businesses, stabilize the economy and open the country to foreign investors (Bich and Quang 1996). At a time when three quarters of the population were dependent on agriculture for their livelihoods, it was crucial that farming households were legally recognized as economic units and endowed with the right to lease land for extended

periods in a move towards decollectivization, providing farmers with an incentive to make longer-term investments (UN 2005). The comprehensive reforms also impacted the banking sector, the labor market, state-owned enterprises, and trade and investment, gradually transforming Viet Nam into one of the world's fastest growing economies (Fan et al. 2004; Minh and Winters 2010).

Between 1991 and 2000 the country's GDP doubled, reaching an average year-by-year growth rate of 7.2 percent (Fan et al 2004). Economic output grew most in the industrial sector (11.2 percent), followed by services (7 percent) and agriculture (5.6 percent). Remarkably, Viet Nam achieved a transition from periods of famine to becoming the second largest rice producer in the world, as well as a major exporter of nuts, coffee and spices (Fan et al. 2004). Further notable events include the accession of Viet Nam in the ASEAN Free Trade Area (AFTA), its admission to the World Trade Organization (WTO), and the realization of the US - Vietnam Bilateral Trade Agreement in 2001, which, in the following seven years, allowed the country to increase its exports to the US by 900 percent (Forbes 2008). Comparatively, in the late 1970s civil aviation in Viet Nam served only three international routes. Today, Vietnamese airlines fly to over 16 domestic locations and 30 major international cities, with 48 different foreign airlines operating in Viet Nam (Chi 2001, VN 2012)

If the economic progress of Viet Nam continues at a similar rate, the country may soon rank alongside the 'Asian Tiger' economies of South Korea, Taiwan, Hong Kong and Singapore (Alver and Perez 2012). Viet Nam's economic success is built on domestic stability, abundance of natural resources[4], a young workforce, and a favorable geographic position (Roy et al. 2009). These factors have enabled the country to remain resilient in the face of the 2008 global economic downturn to record GDP growth of 6.8 percent in 2010 (World Bank 2011a). Comparatively, the European Union averaged 1.6 percent GDP growth among its member-states during the same period (EFA 2011). While these figures indicate bright near-future prospects for the Vietnamese economy, the World Bank urges that comprehensive reforms are required if Viet Nam wants to continue along its high-growth trajectory. This is especially relevant in areas such as corporate governance, transparency, infrastructure development, the cultivation of a skilled workforce, and the continued commitment to meeting sustainable development and poverty alleviation targets (World Bank 2011, The Economist 2012).

Viet Nam's economic performance is dependant upon its position in various global value chains (GVCs). Airports provide the supporting infrastructure for many GVCs in the country, including tourism, high-value goods and perishable commodities, as well as a means of reaching international markets for local businesses and entrepreneurs. Airports directly supported the arrival of around seven million international tourists in 2012,

[4] Please see Appendix I for more detailed information on natural resources.

who's spending generated about fifteen percent of total GDP (VNAT 2012). Industrial parks and special economic zones are often located in close proximity to international airports, with electronics companies (including Samsung, Canon, Fujitsu, and Nokia) and garment producers (such as ZARA, Reebok, Adidas, Puma, Nike etc), establishing operations in Viet Nam in recent years as the result of a young workforce, low wage levels, favourable legal conditions and geographic position relative to large international markets (Bradsher 2008; Tiessen 2o11, Graziano 2012).

Agriculture employs 60 percent of Viet Nam's total population and generates 22 percent of annual GDP (World Bank 2012b). Rice accounts for 45 percent of production; with other important crops including coffee, spices, fruits and nuts (World Bank 2012b). Located at a fertile point between the Indian and Pacific Oceans, Viet Nam's marine resources comprise more than 2000 fish species, of which about 130 have a high economic value (Quang 2005). Among them are catfish, yellowfin tuna and tiger prawn. According to projections by the Vietnamese Ministry of Agriculture, fishery exports will grow by 10.6 percent in 2012 and reach record revenues of USD 6.8 billion (WFA 2012). Perishable goods can lose some or all economic value given exposure high temperatures or humidity (LOTC Nd.). Therefore, 'high-value-to-weight-products' such as fish, fruit, or flowers are primarily moved to markets around the globe using cargo aircraft (Kasarda et al. 2006).

The combined demographic and economic trends of Viet Nam presented above will ensure the future growth of the domestic airline sector, in what is expected to become the world's third-fastest growing aviation industry by 2014 (for further information see chapter 2) (IA 2011). With existing infrastructure operating well beyond intended design capacities, upgrading and development of airports in Viet Nam is vital to its ability to remain competitive in the global economy. The role of infrastructure in supporting economic growth has been recognized by both the Vietnamese government and the greater ASEAN community with the prioritization of transportation infrastructure resulting in significant investments in the region's roads, railways, urban transportation systems, seaports and airports (Muessel and Lowe 2009).

The Political System

In the wake of liberalization/privatization, airport development and operation occurs primarily through public-private partnerships. While there are different models for private sector involvement in the development of airports, the asset ownership oftens remains in the public sphere (Cruz and Marques 2011). This helps the government to maintain a certain degree of control over the construction, operation, management, and financing of aviation-related infrastructure on their territory (Oum et al. 2008). In Viet Nam, it is estimated that the country requires $150- $160 billion for investments in infrastructure-related projects over the next decade. The funding for these projects requires the use of public-private partnerships to reduce the financing burden on the Vietnamese state

(Lindborg et al. 2012). The model of these partnerships and rate of project implementation is distinct in Viet Nam due to its unique style of governance, centralized planning, and regulatory/legal systems.

Viet Nam is a socialist republic governed through a centralized political system by the Communist Party of Viet Nam (CPV). Founded in February 1930, the CPV underwent several periods of restructuring until it reemerged in its current form after the reunification of South and North Viet Nam in 1976. The ideology of the party represents an adaptation of Marxism-Leninism following principles instilled by former party chairman Ho Chi Minh. These governing principles are stipulated in the Vietnamese Constitution, which was officially adopted in April 1992 (MoFA 2012). The strict hierarchical system of governance is divided along national, provincial, district and commune levels, and provides the party with an organizational system spanning from the center to the grassroots (ICEM 2003; MoFA 2012). In order to ensure that the operation of the various governing bodies is in accordance with the guidelines and policies of the CPV, party boards exist throughout judicial and executive bodies at all administrative levels. The Party Congress represents the highest administrative entity in the Vietnamese political system, meeting every five years to assess the political program of the CPV and to elect new party leadership for the coming term — the Central Party Committee. Its members are in charge of appointing the Politburo, the highest organizational entity of the communist party, and among those, select the General Secretary (UNDP 2010).

The National Assembly is the people's highest representative organ and overarching state entity, endowed with both legislative and constitutional rights. All decisions concerning "*... domestic and foreign policy, socio-economic tasks, national defense and security issues, the major principles governing the state machinery, the social relations and activities of citizens"* are made by the National Assembly. Thus it *"...exercises the right to supreme supervision of all activities of the state."* (MoFA 2012). The National Assembly is the only governing body able to draft and ratify amendments to the constitution, national codes, laws, and international resolutions. The President of the Republic is elected by deputies of the National Assembly, acting as head of state and commander of the military. Policy proposals to the National Assembly require a majority vote by deputies in order to receive approval. National Assembly elections are conducted in five year intervals. Deputies are elected directly by the Vietnamese citizens. The executive organs of the National Assembly include ministerial-level agencies. Each minister is appointed by the president following National Assembly approval, but can be dismissed at any time by presidential decree. Similarly, the National Assembly can elect and dismiss individual judges in the Supreme People's Court, the highest judicial organ of Viet Nam (MoFA 2012).

The Vietnamese state has often been criticized by western governments and human rights organizations for its low levels of citizen participation and institutional accountability. In this context, former U.S. ambassador to Viet Nam, Raymond Burghardt, asserted that

while the "...*Vietnamese government feels compelled to call their system democratic* [...] , [...] *the essence of this political system is that no alternative centers of power will be permitted to emerge."* (Folkmanis 2011, 1). The majority of the population possesses very little leverage in political decision-making and it is difficult to publicly voice non-mainstream political thought. According to foreign observers, in the year 2007 only ten percent of those elected to the National Assembly were non-party members (Folkmanis 2011). While political stability in Viet Nam facilitates the uniform implementation of economic growth policies and therein helps attract foreign investment, the concentration of power in the hands of few, both politically and economically, reduces transparency, facilitates corruption, encourages censorship and ultimately undermines state efficiency. Transparency International ranks Viet Nam 112 out of 183 countries, with a score of 2.9/10 on its 2011 Corruption Perceptions Index (Transparency International 2012). In the 2011 Press Freedom Index, an annual publication by Reporters Without Borders, Viet Nam is positioned among the most censored countries in the world, ranking 172 out of 179.

The centralized system of governance facilitates the realization of the state's vision of modernization. In the absence of strong political or social opposition formally recognized by the state, the Vietnamese government is able to design and complete large-scale projects such as dams, roads or ports in relatively short periods of time. However, the rapid implementation of these projects can also lead to unintended social and environmental consequences. The lack of impact analysis and accountability to local populations negatively affects the greater social and economic gains of some projects. For example, the compensation schemes associated with forceful household displacement in order to make way for roads or dams, often motivated by their need to support economic growth, have lead to the increasing poverty and marginalisation of local populations (Pham et. al. 2011). If a similar style of development is applied to the public-private partnerships supporting investments in airports, it is likely that local aspirations will be overlooked.

Concluding Remarks - Country Profile Viet Nam

Viet Nam represents a country at a crossroads between tradition and modernity. On the one hand, it has a strong agricultural sector that provides food security, bolsters exports, and consolidates the country's position as a major trading partner in the Southeast Asian community. One the other hand, processes of modernization, regional integration, and urbanization have resulted in the emergence of new manufacturing industries (e.g. electronics) and large metropolitan centers. As a consequence of the strong economic progress experienced in recent decades, more and more Vietnamese citizens are entering the middle-class, which led to rising levels of purchasing power and consumption. The combination of these factors (export-oriented economy, embeddedness in GVCs, urbanization and rising incomes) have all created a growing demand for transportation and, more specifically, aviation-related services. The role of infrastructure in supporting economic growth has been recognized by both the Vietnamese government and the

greater ASEAN community. With Vietnamese airports currently operating beyond intended design capacities, the CPV has instigated a series of large investments in airport-related transportation networks. The development of domestic airports is necessary to ensure connectivity between domestic and regional urban centers, in turn improving trade and exchange in an economy that is becoming increasingly dependant on regional and global markets. The implementation of current and future airport developments projects is managed by the Ministry of Transport and ultimately the leaders of the CPV, who, through a centralized system of governance, ensure that their vision of modernization is pursued at all project levels. Despite the absence of formally-recognized internal opposition to these principles, the infrastructure development agenda of the CPV is still subject to the regional aspirations of other Southeast Asian nations within the structure of an increasingly integrated ASEAN community.

4.2. The Association of Southeast Asian Nations (ASEAN)

Aviation is an international industry that transports people and goods across borders, and, by doing so, relies on the cooperation between countries to operate successfully. By gradually removing barriers to the free flow of people and goods, Viet Nam's membership in the ASEAN community has contributed to economic growth, reduced regional tensions and domestic political reform. Recent community consensus on infrastructure development as key to remaining competitive in global markets is putting pressure on member-states to invest heavily in transportation networks (ERIA 2010). As a result of regional integration and political reform, foreign direct investment in Viet Nam grew by several hundred percent between 2006 and 2008, contributing roughly 16 percent of GDP and generating 1.5 million jobs (MPI 2010). This demonstrates the importance of regional social and economic integration, which, is highly dependent on transport infrastructure. The following section will present the ASEAN in more detail and show how the aviation sector of Viet Nam impacts and is impacted by recent developments in the region as a whole.

Origins

Formally established in 1967 with the signing of the Bangkok Declaration, the ASEAN's five original member states included Indonesia, Malaysia, the Philippines, Singapore and Thailand (see figure 12). The organization was conceived as a product of emerging Asian regionalism, during a period of intra-regional disputes, domestic instability, and stagnating living standards. In the absence of a mechanism for regional cooperation and conflict resolution, contentious nationalist aspirations and poor collective resource management contributed to low rates of post-colonial development (ASEAN 2009a; NUS 2009). With regional stability high on the ASEAN agenda, the 1971 *Declaration of a Zone of Peace, Freedom and Neutrality* , and the 1975 *Treaty of Amity and Cooperation in Southeast Asia* addressed conflict avoidance and improving member relationships. In contrast, economic cooperation among member-states remained minimal until the end of the Cold War. By

the 1990s, neoliberal policies of democratisation and free trade had reached the ASEAN, prompting an evolution from a loose association of states to a more formal intergovernmental institution (Guan 2004; Cockerham 2010). The process was accompanied by the acceptance of new members including Brunei Darussalam (1984), Vietnam (1995), Laos (1997), Myanmar (1997), and Cambodia (1999). The same decade also saw the organization face political turmoil, ethnic unrest, border clashes and the 1997 financial crisis — challenging dynamics addressed by the ASEAN in its institutional framework (Jones and Smith 2007). This is exemplified by the ratification of a series of treaties in a growing number of policy-areas that culminated in the introduction of the ASEAN Charter in 2007.

Figure 12. ASEAN Member States (Boonsu 2012).

'The ASEAN Way'

Despite the changing institutional landscape of the ASEAN, a constant from its inception has been their member's adherence to a set of rules, norms and values known as the 'ASEAN Way'. These articulate consultation, consensus, informality and non-interference in the internal affairs of other states as the basic principles of the organization, making it a much less proactive intergovernmental institution than its European counterpart, the European Union (Cockerham 2010; Suther 2006; Guan 2004). Without the willingness to incorporate some method of third-party enforcement or a disciplinary authority, the ASEAN Secretariat's role is limited to coordinating policies and monitoring socio-economic progress (Suther 2006). Even the implementation of the ASEAN Charter, which serves as the organization's formal constitution, and commits all members to good governance, human rights and democracy, does not override the basic principles of state sovereignty and non-interference in national affairs (Simon 2008). In this way decision-makers ensured that member states of ASEAN could reserve the right to retain their own

distinct identities, while at the same time committing to a regional vision of security and economic development (Jones and Smith 2007).

The idea of Southeast Asia as a homogenous region represents a Western misconception (Suther 2006). Historically, this part of the world has been deeply fragmented, with countries of great cultural, geographic and developmental diversity. Over the past centuries there have been numerous conflicts over natural resources, national boundaries and deeper ethnic animosities that are reflected in the distinctive political environment of the region (Hung 2010a). Among the ten ASEAN member states, there are parliamentary democracies, totalitarian regimes led by the military, socialist one-party states and constitutional monarchies (ibid.). Acknowledging this diversity, the organization has adopted and retained a cautious approach to regional integration. Some argue that within the Southeast Asian context, it remains the most efficient method to foster regional cooperation, as, according to their rationale, it represents a challenging process especially for developing countries — if accession criteria with regards the the political, social, or economic system become too stringent or intrusive, this can ultimately deter potential member countries or lead to secession (Suther 2006).

Regional integration can also expose the vulnerabilities of participating states, and, given the uneven power distribution in international politics, issues relevant to developing countries may not be handled in their favor (Yang 2001). Following a path of non-interference, the strength of ASEAN lies in its capacity to bring together states with thin institutional linkages to exchange information, reduce transaction costs and diminish mutual suspicions (Ba 2010; Cockerham 2010). In a region otherwise characterized by perpetual change, these strengths have guided the organization successfully for over forty years,. Nevertheless, ASEAN's resistance to adapt to new circumstances and its accommodating institutional culture have also come under criticism. Prominently it has been dubbed a loose association of states, a "*talk shop*"; or "*all bark, no bite*" (Jones and Smith 2007; Ba 2010, 120). Opponents of the ASEAN Way argue that with low levels of government commitment and a general indisposition to surrender principles of non-interference in the internal matters of member states, the effective resolution of humanitarian and environmental issues prevalent in many parts of the region will not be possible (Wainwright 2010). The ASEAN motto of "*one vision, one identity, one community*" may therefore represent an exaggeration of the willingness of its members to adopt regional cooperation as exemplified by the organization's lack of concrete and action-oriented policies (Ba 2010). The main limitation of ASEAN can therefore be viewed as its inability to move beyond concerns of regional security and economic development.

Economic Integration

The first large-scale initiative to bring about economic integration in Southeast Asia was the ASEAN Free Trade Area (AFTA). Established in 1992, this agreement had the objective of eliminating tariff and nontariff barriers to trade among member states within

a timeframe of fifteen years, thereby integrating the region's economies into a single, liberalized production base (Petri et al. 2010). At first this comprised only manufactured products, but was later broadened in scope to the majority of goods originating from within the community (Lee & Plummer 2011). Building on the achievements of AFTA, the year 2002 saw the proposition of a far more ambitious project: the ASEAN Economic Community (AEC). Heralded as one of the future pillars of the association, the AEC is formalized in two legal documents, the ASEAN Blueprint and the ASEAN Charter, and will go into full effect by 2015. The agreements outline the four main objectives of the AEC as: a) the establishment of a single market and production base, including the free flow of goods, services, capital, investments and labor; b) the improvement of the regions competitive efficiency; c) equitable economic development with special focus on initiatives for the less-affluent members of ASEAN; d) the integration of the community into the global economy (Petri et al. 2010; Lee & Plummer 2011). Trade facilitation between members is estimated to result in regional economic growth of over ten percent (Sheperd and Wilson 2009). As outlined in the ASEAN Strategic Transport Plan (ASTP) 2011-2015, the transport network has been instrumental in achieving these targets and closing development gaps throughout the region.

ASEAN political agreements such as AFTA or AEC are critical for development for two reasons. First, its member states have adopted a strong focus on exports and FDI, and are therefore heavily dependent on global markets and their ability to offer attractive investment opportunities. As a result, reduced transaction costs, reliable institutional mechanisms and well-developed infrastructure are necessary to compete successfully (Mirza and Giroud 2003). Second, with a combined GDP of 1,850,855 (US$mn) or three percent of the global production market value, ASEAN displays great disparities between member states in the distribution of wealth and resources (ASEAN 2011a). To ease classification, these can be placed in three categories: a) low income, high-poverty (Myanmar, Lao PDR, Cambodia); b) middle-income, average-poverty (Indonesia, Thailand, Vietnam, Philippines); c) high-income, low-poverty (Singapore, Malaysia, Brunei) (ASEAN 2011b). In numerical terms this means that GDP per capita ranges from USD 419.5 in Myanmar to USD 36,631 in Singapore. Indonesia represents the largest economy with a total annual GDP of USD 511 billion, but only ranks fifth in GDP per capita within ASEAN. The different levels of development of ASEAN member-states are further exemplified by the 33.9 percent of Laos's inhabitants who live below the poverty line of one USD per day, compared to only 2.7 percent of Singapore's population (ASEAN 2011b). Consequently, regional integration and a developed infrastructure network from which to exchange goods, resources and human capital facilitated by political agreements are viewed as key to achieving region-wide prosperity by ASEAN.

Society

The ASEAN has expressed its vision of social and cultural development in Southeast Asia on numerous occasions. The 1997 Hanoi Plan of Action adopted the ASEAN Vision 2020, and states the objective of turning the region into "...*a community of caring societies* [...] *living in peace* [...] *and bonded together in partnership in dynamic development*..." (Caballero-Anthony 2006). In the year 2000 this was followed by the Initiatives for ASEAN Integration (IAI), a programme which seeks to prevent a two-tier ASEAN by narrowing the development gap between old and new member states. Based on self-help mechanisms and training, the IAI focuses on the improvement of infrastructure, human resources, information technology, and economic integration (Caballero-Anthony 2006). More recently, the ratification of the 2009 ASEAN Socio-Cultural Community (ASCC) represents the most comprehensive and ambitious initiative to date on socio-cultural matters in the organization's history. The ASCC's goals are listed as: a) the establishment of social protection mechanisms to improve equity, healthcare and the standard of living for the poor; b) promote sustainable resource use and nature conservation; c) preserve the region's identity and cultural heritage; d) create social governance mechanisms to manage impacts caused by economic integration (ASEAN 2009b).

The goals of the ASEAN presented above depict an ambitious plan. Southeast Asia is a highly diverse region, with significant differences in the cultural, social and economic development of its 600 million inhabitants (ASEAN 2011a). According to the UNDP Human Development Index (HDI), two ASEAN countries are ranked in the 'very high human development' category. These are Singapore (rank 26) and Brunei Darussalam (rank 33), which also represent ASEAN's smallest member states in terms of population and territory. Ranked 61st, Malaysia is the only country that falls in the 'high human development' section. In contrast, Thailand (103), the Philippines (112), Indonesia (124), Vietnam (128), Laos (138), and Cambodia (139) are all much further down the index and placed in the 'medium human development' category. Myanmar (rank 149) remains the only country with a low human development status (UNDP 2011). Appendix IV provides an overview of individual indicators for each country. When aggregating these figures, it can be seen that over the past two decades, poverty rates have declined across the ASEAN region (ADB 2012). However, there remain significant development gaps between its member states in terms of life expectancy (Singapore 81.1; Cambodia 63.1), proportion of people living below the poverty line of USD 1.25/day (Malaysia 0.0 percent; Laos 33.9 percent), and per capita income (Brunei 45,753 USD; Myanmar 1,535 USD) (UNDP 2011; ADB 2012).

Environment

It is important to note that beyond promoting open-sky arrangements and private-sector participation in aviation development, the ASEAN Transport Action Plan emphasizes the pursuit of environmentally sustainable regional transport strategies through the use of green transportation technology and methods (ASEAN 2004). These concerns stem from

a major threat to the overall positive trends in development; high levels of environmental degradation and natural resource overexploitation omnipresent throughout the ASEAN region. Agriculture has been subject to intensification and commercialization, which has brought about an abundant use of agrochemicals and degraded up to 56 million hectares of arable land (Elliott 2012). At the same time the region loses up to 1.8 percent of forest cover annually, which is considerably above the global average of 0.23 percent (ibid.).

Most economic growth in Southeast Asia can be attributed to manufacturing; an industrial sector frequently utilizing outdated technologies and inefficient pollution control (ADB 2002). ASEAN member countries are world leaders in aquaculture, which has led to the degradation of water quality, the destruction of wetland habitats and coastal erosion (UNESCAP 2006). Similarly, increased urbanization has created toxic levels of air pollution, which, in many of the Southeast Asian metropolises lie far above the safety limits recommended by the World Health Organization (WHO) (Ellis 2012). Global warming represent another serious danger — out of the ten countries most imperiled by this process, four are part of the ASEAN, namely the Philippines, Vietnam, Indonesia and Thailand (IPCC 2007). Without stricter regulations and legally binding mechanisms to curb the continuous destruction of the environment, Southeast Asia is at risk to slow its progress or even fall back. With most ASEAN countries relying heavily on the use of natural resources to achieve value added in their industries, the destruction or depletion of these will have drastic consequences for the region as a whole.

Concluding Remarks on the ASEAN

The ASEAN has prompted a remarkable shift within Southeast Asia. After the end of the Cold War and the onset of neoliberal policies, it turned a region of rival nations with tremendous socio-cultural diversity into formal partners for regional development. The 'ASEAN Way', a set of guiding principle in the organization, allowed each member to retain its distinct identity while concurrently committing to a new vision of regional security and economic development. Following a path of non-interference, the strength of the ASEAN organization therefore lies in its ability to unite states with thin institutional linkages to exchange information, reduce transaction costs, and diminish mutual suspicions. In this context, the continuous reduction of barriers to trade has helped the region attain rising levels of prosperity, while fostering cultural exchange and tolerance. These regional aspirations have resulted in the ASEAN community putting considerable pressure on its members to improve transportation infrastructure, reduce tariffs and hidden transaction costs, and support the freer movement of people and goods between countries. Viet Nam, as one of the newer additions to the organization, has profited tremendously from reforms originating from within the ASEAN, with the government adopting the ambitious ASEAN Strategic Transport Plan (ASTP) 2011-2015 as the structure of future infrastructure development.

5. RESEARCH DESIGN AND METHODS

This chapter presents the research design as well as the methods used to collect primary data. The initial sections outline the research motivation, study area, and main objectives of the research. Thereafter, the academic approach of this study is presented in detail, including the research questions (divided into economic and social components) and the conceptual model. The next two parts explain the operationalization of key variables and data collection processes. The final part introduces the supporting organizations who facilitated the fieldwork and concludes with a discussion of the main challenges experienced during the course of this study.

Research Motivation

ASEAN countries have experienced strong economic growth and increasing levels of prosperity over the last two decades (see chapter 4). As catalysts of national and regional development, and representative of a new, modern lifestyle, many airports in the region have witnessed surges in passenger and cargo volumes. Of 26 international airports investigated for this study, sixteen operate at or over maximum capacity (while insufficient data was available for seven airports). The majority of these are located in peri-urban zones between five (Brunei International Airport) and forty kilometers (Bangkok Suvarnabhumi International Airport) from the city center. The current push for regional integration and improved connectivity in aviation infrastructure and related construction projects is driving governments and actors from the private sector to invest heavily. These developments have significant impacts on local populations living in the areas surrounding airports and along the main infrastructure spines to the city center — a process which is not well-documented in middle to low-income countries.

To capture the scope of airport development in Southeast Asia, the three largest airports in terms of annual passenger volume were selected from each ASEAN member state. Information on current passenger/cargo volumes, annual growth rates, current/future expansion projects, land classification, and distance from urban centers was collected. The resulting table demonstrates that, without exception, airports in Southeast Asia are under tremendous pressure to keep up with the economic and social development of the countries in which they are located. Examples include Soekarno–Hatta International Airport (CGK) in Jakarta, Indonesia, which was built for an annual passenger capacity of 38 million, and has reached over 51 million in the meantime; or Manila's Ninoy Aquino International Airport in the Philippines, handling close to 30 million passengers in 2011 despite the original design structured to accommodate a maximum of 28 million (JP 2011; ACI 2012; MIAA N.d.).

The increased use of air transport in Southeast Asia is shown by the annual growth rates experienced throughout the industry. Between 2010 and 2011, the majority of airports examined displayed positive passenger growth figures between 4.5 percent (Brunei

International Airport), 10.7 percent (Singapore Changi Airport), and 22.2 percent (Chiang Mai International Airport), while only one airport exhibited negative growth (Ngurah Rai International Airport) (ACI 2012). As a result, many airports in the region face constraints that create safety issues, delays and operational inefficiencies. Airport authorities try to catch up to demand by upgrading existing facilities (Yangon International Airport), building new terminals (Phuket International Airport), or extending runways (Kota Kinabalu International Airport) (MT 2011; PM 2012; AT N.d.*f*).

Typically airports located outside the city in peri-urban zones are encompassed by lower levels of development (e.g. Phnom Penh International Airport). This can create tensions between the local population who depend on the land for their livelihood, and the airports' need for space to grow (e.g. Wattay International Airport). Appendix II provides an overview of all 26 airports included in this analysis. The sample of major airports in Southeast Asia resulted in the use of Noi Bai International Airport in Hanoi, Viet Nam as a case study that was inclusive of all the above-mentioned challenges facing airports in the region (peri-urban context, low levels of development, over-capacity, spatial constraints, large-scale expansion projects). Furthermore, rural communities living around the airport exhibit similar characteristics to those found in other peri-urban areas throughout Southeast Asia. Together, these similarities are supportive of a case study that is representative of the many challenges shared by airport operators and governments across the region.

Research Area

Soc Son District is located thirty-two kilometers north of Hanoi city-center and covers a total land area of 306.51 square kilometers (Van den Berg et. al. 2006). Home to 270,000 inhabitants that live in more than 190 small-to-medium sized villages (2005 figures), the area has an average population density of 881 people per square kilometer (Anh 2011b; Van den Berg et. al. 2003). Soc Son is classified as rural, with seventy percent of households engaged in farming, livestock breeding, and small business for their livelihood (Tuyet 2012). This includes the cultivation of spring paddy, winter paddy, maize, fruits, vegetables and flowers (Van den Berg et. al. 2003). Based on 2002 figures by the National Statistics Office of Viet Nam, it is also one of the poorest suburban districts of Hanoi with an annual per capita income of 6.8 million VND (USD 400) (Anh 2011b; Hoi 2012).

The five sub-districts of Thanh Xuan, Quang Tien, Mai Dinh, Phu Coung and Phu Minh combine to share the southern half of Soc Son. In their middle lies Noi Bai International Airport, which was originally a Vietnamese Air Force base converted to commercial use in 1978. The construction of Terminal 1 (completed 2001) was designed to accommodate six million passengers per year — a number which has been surpassed in recent years and as of 2011 reached a record eleven million. Due to the consistent overcapacity, the airport is in the process of modernizing Terminal 1 and erecting a second terminal to increase its capacity to 15 million passengers by 2014 (Nguyen 2012c). In the long run this will be

supplemented by terminal buildings three and four, the construction of a second runway for commercial use, and the extension of the cargo terminal and aircraft parking areas (ibid.). Adjacent to th north of the airport, along the border between Quang Tien and Mai Dinh, lies Noi Bai Industrial Park, a 100 hectare free-trade zone home to multinational corporations from foreign countries including Japan, Taiwan, Singapore, Thailand, Malaysia, and the United States, employing around 15000 people (GPG 2012; BiA 2012). The close proximity of low-income agricultural communities to the airport and related industries creates a sharp contrast between traditional and modern Vietnam. These contrasts accentuate both the positive and negative spillovers of airport operation on local communities.

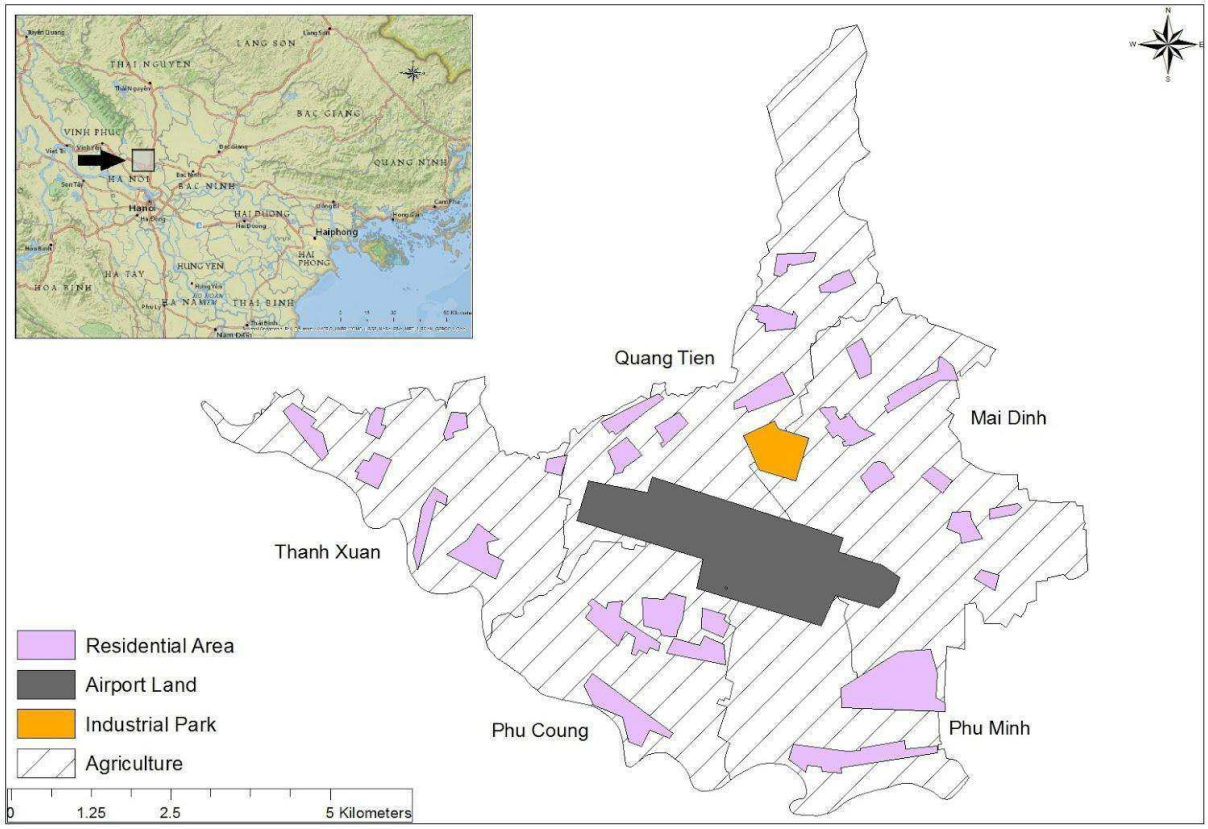


Figure 13. Map of the Research Area with Noi Bai Airport at the Center.

Research Objectives

The central focus of the research is to identify ways to improve the livelihoods and outcomes of local populations affected by the presence of airports in developing countries. While airports are often hailed as drivers of national, regional and global economies (see chapter 3), their local socio-economic impacts are rarely explored in the context of middle and low-income countries. The aviation industry is beginning to rethink traditional approaches to airport development, with use of the term sustainability within aviation becoming increasingly popular — but to what merit? Measuring current impacts provides the basis from which the planning of future airport projects can be assessed with regard to sustainable development. It can also help to highlight opportunities to minimize negative impacts, develop human capital, and support local livelihoods. The potential of

the airport sector to act responsibly and contribute to sustainable development should not be dismissed due to the aviation industry's dependence on fossil fuels. Planning, design, and operation of airports all play a significant role in respect to sustainable development. The research is structured on two central objectives: first, to assess the economic impacts of airport development in Soc Son District; and second, to identify parts of the population that benefit and those that are most vulnerable to the economic impacts associated with airport expansion/operation.

- **Economic impacts:** the first research component aims to provide a better understanding of the economic effects (direct, indirect, induced, and catalytic) of airport development and operation on communities situated in close proximity to international airports — an area of study often overlooked when compared to more macro-oriented research on the benefits that airports bring regional and national economies. More specifically, existing economic impact models will be applied to Noi Bai International Airport and the five sub districts of Soc Son in Viet Nam with the goal of determining if the economic benefits of airport development are inclusive of local communities and businesses.

- **Social impacts:** the second research component aims to explore the capacity of rural/peri-urban populations in Viet Nam to adapt to changing socio-economic structures related to the presence of an international airport. Numerous studies have advocated the importance of airports in facilitating global connectivity, yet very little has touched upon the impacts of airports on local communities in developing countries beyond direct economic impacts. A livelihoods framework is used to assess the availability of and accessibility to different types of capital in local communities. The framework will identify likely livelihoods strategies and coping mechanisms, addressing the gradual transition from rural communities to urban areas. The objective of this component is therefore to determine if the presence of an airport supports the realization of the aspirations of local households, or inversely, if it presents additional constraints and increases their vulnerability to economic shocks.

- **Emerging models of airport development:** based on the research findings, it is the goal of the third component to examine conventional and emerging models of airport development in a comparative manner. These models will be applied to likely airport development scenarios in Noi Bai, from the status quo to future models of stronger sustainability, in order to assess their potential impacts using the context-specific knowledge generated in the socio-economic analysis outlined above.

Research Questions - Economic Impact Analysis

Primary Question

- How does airport development and operation in Soc Son District influence the economy of communities located in close proximity to Noi Bai International Airport?

Secondary Questions

- In what ways can the direct and indirect economic activities generated by airport development and operation be inclusive of local households and businesses?

- What, if any, opportunities exist for residents of Soc Son to generate additional income as a result of being located close to an international airport?

Research Questions - Social Impact Analysis

Primary Question

- How do the impacts of Noi Bai Airport differ depending on the varying combinations of livelihoods assets (human, financial, physical, social and natural) available and accessible to different parts of the local population?

Secondary Questions

- Which socio-economic characteristics of local households facilitate adaptability to changing economic structures in local communities? Inversely, which types of households exhibit the highest degree of vulnerability to the same processes?

- To what extent do the processes associated with Noi Bai influence the accessibility to, and availability of local livelihood assets?

Conceptual Model

The conceptual model displays the complex and highly-interrelated system of processes associated with airport-related activities in local communities. Within this system local residents are affected by the social, economic and environmental spillovers of decisions regarding operation and development made at the airport. The availability, accessibility and quality of livelihoods assets used by local populations strongly influence the livelihood strategies invoked in response to both positive and negative impacts. Chapter 6 focuses on the direct, indirect, induced and catalytic impacts of the airport, while Chapter

7 investigates how these impacts are distributed in local communities according to the livelihood assets people have available to cope or benefit from the increasing modernization of Soc Son District. A synthesis of both chapters will be applied to current real-world processes at the airport, and anticipated future development to assess the sustainability of transportation infrastructure development in peri-urban Hanoi. A better understanding of the effects that airport-related activities have on local communities in developing countries will help make large infrastructure projects more sustainable in the long term, from both the perspective of local residents and airport operators.

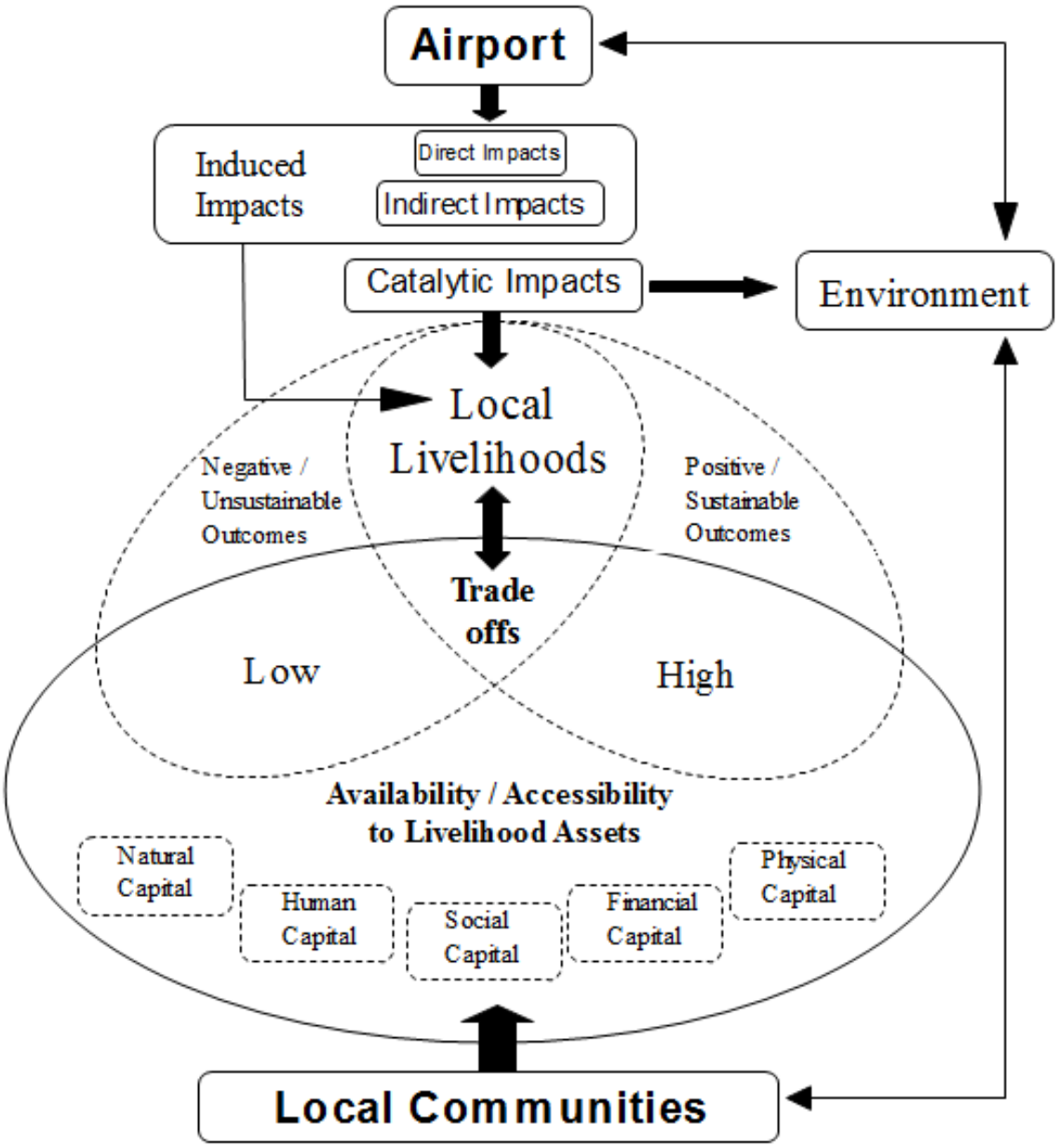


Figure 14. Conceptual Model.

Measuring Impacts

The notion that airports benefit global economic systems is widely accepted, and has been supported by multiple studies (e.g. Button and Taylor 2000; Gillen 2009; or Kasarda et al. 2006). Less attention has been paid to the socio-economic impacts of aviation infrastructure in emerging economies, and, within this context, few studies investigate these impacts in areas surrounding the airport. In most ASEAN countries, airports are located in peri-urban areas exhibiting low levels of development and increasing urbanization. Processes at the local level involve a multitude of stakeholders that range from airport-users to service providers, employees, investors, government, airlines, and local communities (Schaar and Sherry 2010). The use of existing impact assessment models can help to structure the linkages between an airport and people living in its proximity.

Impact assessments are categorized within three overarching frameworks: economic (CDM Smith 2012), social (ATAG 2008), and environmental (Luther 2007). Economic impact analysis is a research method frequently utilized by airport authorities, government agencies and urban planners, to gauge the value of an airport to the wider economy (Venckus and Gladys 2011). This includes the measurement of quantitative indicators such as employment, income, tax revenue and productive output, and more qualitative variables of its benefits and costs to society (ACI 2004; Venckus and Gaidelys 2011). Social impact assessments complement the economic perspective by *"...analyzing, monitoring and managing the social consequences of development...",* and provide tools to examine an airport's effect on groups, households and individuals (Vanclay 2003, 6).

A sustainable livelihoods framework is used to structure the impact of airports according to the human, social, physical, economic and natural capital available in Soc Son district. The pro-poor, people-centered and responsive nature of the livelihoods approach supports the research objective of identifying strategies to improve the wellbeing of local communities (Serrat 2010). Furthermore, the concept of vulnerability can help assess the risks, shocks and stresses of a community, and its ability to cope with processes linked to airports. Environmental impact assessment describes "... *the total process of assessing the environmental effects of a development project.*" (FOTE 2005, 2). As environment-specific impacts are more commonly explored in aviation-related academic literature (e.g. Asinjo 2011; OECD 2012; Lurie and Townsend 2007), they will not be addressed individually, but rather in their relation to social and economic processes.

Operationalization of Key Concepts

The data collected during the research process provides the basis for formulating recommendations that seek to achieve sustainable outcomes for local communities affected by the operation and growth of Noi Bai Airport. The following section presents key theoretical concepts from academia and industry-related publications that are instrumental to the analysis and application of data gathered during fieldwork in Viet

Nam. Each concept will be presented in more depth in the introductory sections of the analysis.

- **Direct Economic Impacts**: Direct impacts are measured by on-site airport employment and related income (Cristureanu and Bobirca 2007). Comparative analysis with local, national, and international averages contextualizes this information.

- **Indirect Economic Impacts:** Indirect impacts pertain to economic activity directly dependent on airport-supply chains (AFA 2011; Venckus and Gaidelys 2011). Sectoral analysis is used to gauge the distribution of local employment supported in the chain of suppliers of goods and services to the airport.

- **Induced Impacts:** Induced impacts relate to the multiplier effects brought about by successive rounds of income spending throughout the local/regional economy as a result of the direct and indirect impacts of an airport (ACI 2004; ACRP 2008). Spatial analysis is used to determine the amount of this expenditure captured in the study area and beyond.

- **Catalytic Impacts:** Catalytic impacts represent effects related to an airport's ability to stimulate wider economic productivity, employment, domestic investment and tourism (Halpern and Brathen 2010). Qualitative analysis is used to gauge community perception regarding the catalytic economic impacts of Noi Bai Airport.

- **Human Capital:** The concept of human capital is used to frame the level of education, skills, and knowledge attained by, and available to, household members to generate economic value (Dae-Bong 2009). Using sectoral analysis, the research examines time available to participate in income-earning activities, educational achievements, community perception of educational services, and income-related indicators to gauge the human capital available to the local population.

- **Financial Capital:** The concept to the cash, credit/debt, savings, remittances, and physical assets which are essential for the pursuit of a livelihoods strategy (Rakodi and Lloyd-Jones 2002). Using sectoral and spatial analysis the financial capital local community residents is analyzed by looking at personal income, household savings and monetary reserves, job security, and support systems.

- **Physical Capital:** Physical capital represents the basic infrastructure (transport, energy, communications, water, shelter) and the production equipment which enable people to pursue their livelihoods (Rakodi and Lloyd-Jones 2002). An assessment of the inventory of private assets available to local communities as well as the quality of public physical infrastructure study area are used to gauge the physical capital available to local community residents

- **Social Capital:** The concept refers to the social resources (networks, claims, relations, affiliations, and associations) upon which people draw when pursuing livelihood strategies that require coordinated action to increase trust and the ability to cooperate among individuals and groups (Kollmair and Gamper 2002). Based on the perception of survey respondents, social capital is measured through the examination of job-seeking behaviour and political participation of the sample.

- **Natural Capital:** This concept is used to analyze the resource stocks from which resource flows essential to the pursuit of livelihoods strategies are derived. These comprise common pool resources such as land, water, air, and other environmental resources (Scoones 1998). In order to gain a better understanding of the natural resource stocks in the study area people's perception of environmental pollution is investigated with regard to availability and quality of these resources.

Data Collection

The impacts of airport development can be felt on a variety of spatial scales. This research project focuses on the village level and the area surrounding the airport, but also presents the wider significance of the aviation industry in today's globalized world. In order to provide the necessary background information and to put the research topic into context, a comprehensive literature review has been conducted on models of airport development, as well as the aviation industry from a local (Hanoi), national (Viet Nam), regional (ASEAN) and global level. This information has been gathered through desk research that combines both academic sources as well as publicly-available reports from consulting firms, airport operators, and international organizations. Newspaper articles were used to a lesser degree. Statistical information on the case study was retrieved from the online database of the General Statistics Office of Viet Nam, while information on the expansion project at Noi Bai Airport was made available by the host organization. With secondary data used to set the stage, primary data was compiled to find answers to the research questions. For this purpose, the fieldwork process in Viet Nam included multiple components such as field reconnaissance, the collection of questionnaires, focus group discussion, emails interviews, and meetings with decision makers and political actors. To provide a balanced picture, both qualitative variables and quantitative measurements were

investigated. The resulting data was processed with IBM's SPSS statistics software and Esri's ArcGIS program.

- **Questionnaires:** these provided the foundation of the primary data analysis and were divided into two categories: airport employees and local communities. The airport employee questionnaire comprised 38 questions together with an open feedback section designed to collect information about the working situation at Noi Bai Airport, employees' perception of the airport as an employer, and the capacity-building opportunities related to their employment. In total 298 questionnaires were collected using a stratified systematic sample (i.e. every 10th employee out of the airport's five departments participated in the survey), of which 274 could be processed for data analysis, representing roughly ten percent of the total workforce at Noi Bai. The local community questionnaire was conducted in five settlements and sought to provide a better understanding of the livelihoods situation of people residing in close proximity to the airport. Its 42 questions cover the respondents' perception of the airport, economic variables and social indicators. Applying a cluster sample technique, a total of 315 local community questionnaires were compiled, of which 305 were suitable for analysis. Figure 15 offers a brief summary of the data collected; the questionnaires can be found in Appendix V.

	Airport Employees	Local Communitie
Sample Size (n)	274	305
Male (%)	61,3	37
Female (%)	38,7	63
Mean Age (%)	35,9	41,9
Mean Age Male (%)	37	39,7
Mean Age Female (%)	34,3	43,7

Figure 15. Questionnaire Summary

- **Expert Interviews:** four expert interviews with open questions were conducted over the course of this project in person and via email. The first interview involved environmental scientist Mr. Pham Van Hoi, who teaches at Hanoi Agricultural University (HAU) and focuses his research on sustainable peri-urban and rural development in Vietnam. He provided information on the main challenges and opportunities for people living in Soc Son, and commented on the impact of Noi Bai Airport on the livelihoods situation of the local population. The second interview was conducted with Mr. Nguyen Duc Hung, vice president of the Airport Corporation of Vietnam, who provided statistical data about

Noi Bai Airport and Hanoi's competitive outlook within the ASEAN. He also presented insights into expansions plans, both inside the fence and outside the fence, and what this means for affected communities. In the third interview Ms. Dinh Thi Anh Tuyet, chairwoman of the board of governance at VietEd, explained the dynamics of economic development in peri-urban Hanoi, and how farmers invest the money they receive from microloans. Lastly, Ms. Tran Thi Du, president of the Women's Union of Soc Son, touched on the importance of public services in the district, and how processes of airport, urban expansion and agriculture combine to place strong pressure on the land, and its impacts on the local population.

- **Focus group discussion:** a focus group discussion was held at the administrative offices in Mai Dinh. The meeting included representatives from the Soc Son Women's Union, VietEd employees and local government officials. The discussion covered the role of the Noi Bai Airport as a facilitator of local economic growth, aspects of infrastructure development related to airport use and expansion, and the availability/accessibility of basic services to people living in the surrounding villages. The Soc Son Women's Union and VietEd are two organizations deeply involved in local affairs and committed to their improvement. They summarized the livelihoods situation of people in the five communities and talked about their personal experiences living in Soc Son. While the focus group discussion did not allow direct access to the most subaltern population groups, it still provided invaluable information about poverty and marginalized populations in Soc Son. The meeting was also used to present the research topic and find an effective fieldwork strategy.

- **Pilot study:** a pilot study was conducted with a group of students from a local foreign language school, four Vietnamese employees from the offices of the host organization, and members of the Soc Soc Women's Union. It was the goal to check the validity and applicability of the questionnaires, avoid overly abstract notions, ensure the cultural sensitivity of the questions, and practice fieldwork. Based on the feedback of the interviewees, some questions were revised to improve readability and clarity.

Supporting Organizations

The research was conducted under the guidance of Airis International Holdings LLC, an aviation facility development company based in Houston, Texas. Founded in 1994, the company's services provide pre-construction research and analysis, planning, design, engineering, project financing, aviation operations and project development. The research was supported by the staff of Airis' Southeast Asia office in Hanoi, who provided key introductions to the Airports Corporation of Vietnam (ACV) and the Viet Rural Enterprise Development Center (VietED). ACV is a state-owned limited company that currently operates 21 airports in Vietnam (see chapter 4). The management of ACV in Hanoi provided access to the various departments of Noi Bai and assisted in the data collection with airport employees. VietED made possible the distribution of questionnaires in the local communities and hosted discussions with local organizations and state officials. As an organization that promotes capacity-building and community empowerment, it is VietEd's mission to *"...to support the development of community economic activities through enhancing the business development understandings and skills of low-income households and micro-enterprises, focusing on rural and disadvantageous areas, by connecting appropriately and effectively financial opportunities, science and technology, organizations/networks and the market."* (VietEd N.d.). Soc Son's Women Union, a community organization that supports households throughout the area with vocational training courses and business loans, helped with the distribution and collection of the local community questionnaires and participated in focus group discussion (Thuy 2007). The Soc Son Women's Fund directly provides "*...5,000 people with outstanding loans of about eight billion VND* [USD 383,800] (Tuyet 2012: 1)." In partnership with financial institutions and the government the support provided under the guidance of the Women's Union totalled VND 30-40 billion (USD 1.88 - 2.5 million) (Thuy 2007)

Research Limitations

During the course of this study, a number of unexpected challenges emerged, creating limitations but also new opportunities for the research. First, Viet Nam represents a difficult environment for academic research on account of its bureaucratic system, hierarchical decision-making structures and strict control of information. Initially, the narrow fieldwork timeframe relied on a strategy of using formal introduction letters and employing local English-speaking students to collect data. While endorsement from the district chairman of Soc Son was obtained quickly, final approval from the Ministry of Transport was subject to several weeks of delays. In response, the survey strategy was revised after meeting with representatives from the rural development organization VietED, who not only provided an official platform from which to perform the survey, but also, through cooperation with the Soc Son Womens' Union, made it possible to increase the scope of the study and the number of respondents. While time and effort pursuing the initial strategy did not lead to the expected results, the opportunity to cooperate with VietED was greatly beneficial to the research.

The second major challenge encountered was the significant language barrier. While the Vietnamese education system has seen substantial investments in providing language lessons in state schools, fluent English speakers remain an exception (Parks 2011). This is supported by the survey findings, which show that in the rural communities targeted, less than five percent of respondents are able to communicate in English. As a consequence, all material and documentation related to the data collection process required the help of translators. With more than six hundred questionnaires gathered in this project, each including open questions, translations had to be done both from English to Vietnamese, and vice versa — a process which was both time consuming and resource intensive. Similarly, most expert interviews required an interpreter present during meetings or for correspondence via letters/emails. The dependence on translation made it difficult to delve deep into sensitive questions or develop organic discussions with the people who were interviewed.

A further limitation was the the project's reliance on a single case study to generate data. While Viet Nam in general, and Hanoi in particular, present a suitable basis for the research of airport development in Southeast Asia, the experiences of Noi Bai are not fully representative of the entire region. Rather, they offer one perspective of the complex issues surrounding airport development and impacts on local communities in the ASEAN. Although the findings can be generalized to some extent, the diversity of Southeast Asia requires more comprehensive research inclusive of all stakeholders types, a larger geographic scope and additional case studies from different countries to fully identify relevant sustainability indicators and best practices in airport development.

6. ECONOMIC IMPACT ANALYSIS by Pascal Fentsch

Economic impact analysis is a research tool used by airport authorities, government agencies and urban planners to gauge the effects, both positive and negative, of an airport within a specific geographic framework (Venckus and Gaidelys 2011). This includes the measurement of quantitative indicators such as employment, income, and productive output, as well as more qualitative variables related to the perceptions of costs and benefits held by stakeholders (ACI 2004; Venckus and Gaidelys 2011). The following section will investigate the economic impacts of Noi Bai International Airport on the surrounding district of Soc Son, and the greater Hanoi metropolitan region through the presentation of direct, indirect, induced, and catalytic impacts compiled from the primary data collected during fieldwork. Figure 16 provides an overview of key indicators related to the operation and growth of Noi Bai Airport, which will be discussed in more depth throughout the analysis.

Noi Bai International Airport (HAN) at a Glance	
Inauguration	1978
Location	45 km north of central Hanoi
Airport Employees	3000
Airlines Operating to/from Noi Bai	29
Daily Flight Movements	250
Ground Area Termianl 1	90,000m²
Number of Gates	10
Design Passenger Capacity	6.5 million
Passenger Volume (2011)	11 million
Passenger Growth Rate 2010-2011	13.4%
Cargo Volume in Tons (2011)	252,046
Cargo Growth Rate 2010-2011	16.2%
Airport Authority	Airports Corporation of Viet Nam

Figure 16. Noi Bai Airport at a Glance.

6.1. Direct Economic Impacts

The income-expenditures method was first introduced in 1988 to assess the economic impacts of Los Angeles International Airport (Montalvo 1998). Today it has become the standard methodological framework used in airport-related research, and has resulted in the current distinction between direct, indirect, induced and catalytic economic impacts (ACI 2004). Within the framework direct impacts are represented by fluctuations in employment and income directly linked to on-site airport operation and development. These fluctuations are most-commonly measured by the amount of employment created on-site and its subsequent impact on local incomes (Cristureanu and Bobirca 2007, Ritchie and Miles 2008). A stratified systematic sample was applied to the airport

employees in a questionnaire format[5], which yielded a total of 274 responses suitable for analysis.[6]

Noi Bai Airport currently employs approximately 3000 people directly on-site (Nguyen 2012c) In order to calculate their total payroll, these were asked to indicate their monthly take-home income within categories derived from secondary data on average monthly incomes in greater Hanoi. The aggregate data shows that airport employees earn an average monthly income of around 7.3 million VND (~350 USD) or 87.6 million VND per year (~4200 USD). The results indicate that the sample population earns more than double the regional average (~1800 USD) and four times the national average (~930 USD) (IA 2012). While comparative case studies from developing countries are unavailable, statistical data from North America, Europe, and Oceania can help place the findings in perspective.

Glasgow Prestwick Airport, the smallest airport referenced (2.4 million passengers in 2008), employs a total of 476 people who earn, on average, 31512 USD a year (SQWC 2008). The medium-sized Edmonton City Center Airport (6.5 million passengers annually), employs 950 people who are paid an average wage of 43158 USD (IV 2005; EIA 2012). Sydney International Airport is the largest airport in this selection (35.6 million passengers in 2011). Its 25839 on-site employees earned an average of 45329 USD in 2008 (Ritchie and Miles 2008). In all three cases, airport employees were found to have average incomes close to (Sydney and Glasgow) or below (Edmonton) the median national income of their respective home countries. In contrast, employees from the sample at Noi Bai Airport earned well-above the national average, placing them firmly in the upper-middle to high income levels of the Vietnamese economy. This comparison shows that while employees of Noi Bai Airport receive considerably less monetary compensation than their western counterparts, their incomes afford them a relatively higher standard of living within Viet Nam.

A second questionnaire was used to collect data from populations living in the vicinity of Noi Bai Airport, in the surrounding district of Soc Son[7]. Applying a random cluster technique, it revealed that the residents of the five sub-districts (Mai Dinh, Phu Minh, Phu Cuong, Thanh Xuan and Quang Tien) earned marginally less than the 37 million VND (~1800 USD) average annual income recorded for the greater province of Hanoi. Using a weighted average, the data found that 305 respondents from the local sample communities earned an average income of approximately three million VND a month, or the equivalent of 36 million VND (~1725 USD) each year. The range of incomes within the local community sample was also greater than in the airport employee sample, with local incomes ranging from less than one million VND (9.8 percent) to over ten million

[5] Please see Appendix V for both Vietnamese and English versions of the airport employee questionnaire.
[6] The airport sample allows for a +- 5 percent margin of error and 90 percent confidence rate.
[7] Please see Appendix V for both Vietnamese and English versions of the local community questionnaire.

VND (1.3 percent) a month. In comparison, 94.1 percent of airport employees earned at least four million VND/month. The higher levels of income experienced by employees of Noi Bai Airport in relation to local, regional and national averages are illustrated in figure 17.

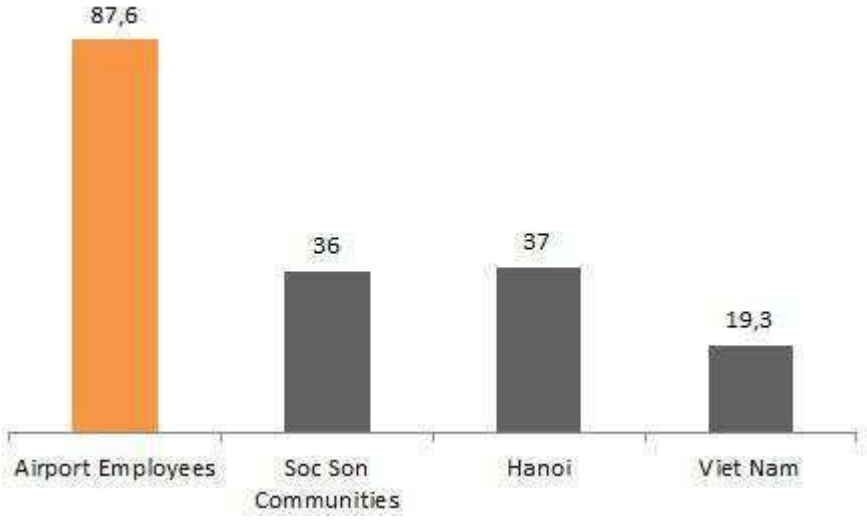


Figure 17. Comparison of Annual Per Capita Income (VND millions) (based on IA 2012)

The income figures presented above, when aggregated, demonstrate that Noi Bai Airport contributes an estimated total annual payroll of 12.6 million USD to the regional economy.[8] With close to 75 percent of the airport sample responding that they have been employed in their current position for more than five years, it can be argued that the direct economic impacts of Noi Bai remain relatively stable. In addition, among the portion of the sample that have been employed at the airport less than five years, the large majority are below the age of 33, which is indicative of the growing workforce at Noi Bai. Of those employed for less than a year, 85.7 percent were under the age of 33, with a further 42 percent under the age of 25. Similarly, of those employed at the airport for a period of between one and five years, 88.9 percent were under the age of 33, and 22.1 percent were younger than 25 years.

The lengths and age structure of employment witnessed at Noi Bai present the airport as both a long-term employer and a provider of new employment to the local and regional labor market[9]. In Europe, a study of fifty-nine airports found that they directly "*...support on average around 950 on-site jobs per million passengers....*" (Cristureanu and Bobirca 2007; 39). Based on the above employment figures, Noi Bai generates around 270 on-site jobs per million passengers, which represents a significantly smaller workforce-to-passenger ratio than experienced at European or North American Airports. One possible determining factor of this disparity may be attributed the underdevelopment of passenger services at Noi Bai, which do not provide the large-scale retail, accommodation, logistics, and

[8] The calculation uses the value of 3,000 Noi Bai employees earning an average of 87.6 million VND/year.

[9] The findings indicate that most people hired are young and well-educated, which could confirm trends that adaptability to changing economic circumstances decreases with age (see chapter 7).

catering facilities often associated with airports in high-income countries. As demand for these services increases alongside the projected growth of passenger volumes, it is likely that the workforce of Noi Bai will continue to grow, both in terms of the passenger-to-employee ratio and total employment.

The main sectors of employment at Noi Bai are categorized as ground services, accounting and administration, passenger services, security, and flight management/air traffic control. Within these sectors, more than half of all employees (50.7 percent) indicated that they had moved to Hanoi from another province, of which 73.3 percent migrated in order to find employment. The ratio of migrants was especially high in the department of air traffic control/flight management, and to a lesser extent in security and accounting/administration. People working in passenger and ground services most frequently indicated that they originated from the greater Hanoi metropolitan area. This relationship indicates that high-skilled/specialized jobs are sourced from a wider geographic area as compared to positions that require lower levels of education/specialization.

With the ongoing modernization of Noi Bai Airport, and its eventual expansion, the demand for low-skilled labor is going to increase disproportionately more than vacancies for high-skilled positions. According to the relationships observed above (modernization and passenger growth leading to higher on-site employment; lower-skilled positions filled with residents from the region) it is likely that in the future most local residents who find employment at the airport will do so in the passenger-services sector. This also represents a trend which can be observed in other airports around the world, which are frequently criticized for generating low-skill/low-income employment (Vettori 2011). In this context, many large airport such as Seattle-Tacoma International Airport (SEA), London Gatwick Airport (LGW) or Los Angeles International Airport (LAX) employ subcontractors for tasks such as baggage handling, fueling, or food services, in order to reduce costs and circumvent labor unions (Orlav 2007, Leight 2012, Jones 2012).[10] While providing employment, these types of airport operators take advantage of the abundance of low-skilled labour, while in return offering little human capital development or upward mobility.

Concluding Remarks - Direct Economic Impacts

The direct economic impacts of Noi Bai International Airport are measured through the examination of on-site airport salaries. With wage levels exceeding twice the regional and national income averages, airport employees exhibit a high purchasing power within the local economy. As an employer the airport thus enables its workforce to join the increasingly affluent middle-class, which, with their spending behavior and new, modern lifestyle, have had a fundamental impact on the region's economy, consumption patterns

[10] It was found that 8 out of 265 respondents worked for subcontractors at the airport.

and cultural development. In this context locally-sourced employees represented a minority of the total airport workforce, but a majority of low-skill employment. In contrast, highly specialized labour was found to be predominantly filled with people having migrated from outside the province of Hanoi. With the low on-site job-per-passenger ratio of Noi Bai attributed to the underdevelopment of passenger services, the modernization taking place at the airport is likely to instigate growth of these services, in turn increasing demand for non-specialised labour. As a result, in the short-to-medium term, the recruitment to low-skill positions will outpace that of higher-skill jobs leading to more employment opportunities for local populations.[11]

This trend has already been witnessed in recruitment over the past years, which has been dominated by hiring in passenger-related and ground services (low-skill), whereas employment in the departments of flight management/air traffic control, customs/security and administration/accounting (high-skill) showed almost no increase over the same period. The current hiring practices of Noi Bai are providing local job-seekers increasingly more opportunities to find employment at the airport, but mostly in low-skill positions. In this section the term 'low-skill' is used within the context of airport employment; in a broader context, however, new hirees are often well-educated. Recent investments in Viet Nam's education system (see chapter 7) are allowing younger generations to achieve progressively higher levels of education, which is exemplified by the hiring (almost exclusively) of people below the age of 33 in the past five years. As adaptability to changing economic circumstances generally decreases with age, it can be argued that older generations in the Soc Son area will experience very few opportunities to engage directly with the airport as a means of livelihood. The next chapter will investigate the indirect economic impacts of Noi Bai Airport.

6.2. Indirect Economic Impacts

Indirect economic impacts can be measured by "*...employment supported in the chain of suppliers of goods and services to the direct activities.*" (AFA 2011: 12). These supply-chains include "*...aviation suppliers, construction companies that build airport facilities, manufacturers of goods sold in airport retail outlets,* [...] *a wide variety of activities in the business services sector...*" , food and beverage suppliers to on-site catering, taxi drivers and many other sectors as long as they are "*...directly and closely-related to, or even solely dependent on the airport.*" (ATAG 2012b: 6; Venckus and Gaidelys 2011: 438). By definition, these supply chains owe their existence to the airport and comprise a wide range of private and public actors. The types of businesses which operate outside of the airport premises and participate in airport-supply chains include, amongst others: banking/insurance agents; printing/publishing services; transportation providers, including taxi operators, bus companies and car rentals; airport parking; catering services for restaurants and airlines; wholesalers of products sold in on-site retail; interior furnishings for offices, stores and restaurants; maintenance and fueling

[11] In the Soc Son sample, only three out of 305 residents worked at the airport.

services related to transportation; construction companies; and accommodation providers such as hotels (HJAIA 2005). The extent to which airport supply-chain networks benefit local businesses and households is determined by the capacity of the local economy to provide goods and services required to support on-site airport activities. The structure and characteristics of the local economy around an airport can therefore provide strong indicators of its ability to capture revenue flows in airport-related supply chains.

In Soc Son District and most of peri-urban Hanoi, agriculture represents the primary source of household income (Thapa and Murayama 2007). Roughly 70 percent of people living outside of Hanoi's urban core earn a living from growing crops, breeding livestock, or operating small-businesses related to agriculture (Tuyet 2012). Niimi et al. (2008) report similar figures, but also describe a decline of employment in the agricultural sector throughout Viet Nam: from close to 80 percent in 1990 to around 58 percent in 2004. This can partly be attributed to the passing of new enterprise laws[12] by the Vietnamese government, endowing private citizens with unprecedented economic freedoms and entrepreneurial rights (Ho Nd.). The local community survey confirms the decline of agricultural employment in Soc Son, recording employment rates in agriculture slightly below the 2004 national average. Within the district 56.5 percent of the sample population worked in agriculture, the majority of whom were either self-employed (52.8 percent) or dependent (35.8 percent).[13]

The importance of agriculture to local livelihoods is illustrated by the aerial photograph in figure 18, depicting the eastern edge of Noi Bai Airport and parts of residential Mai Dinh. The land-use of Soc Son is dominated by high-density smallholder farming, with clusters of small-to-medium sized settlements interspersed throughout the district. With over seventy percent of all land classified as cultivated, most local income is derived from crops, consisting primarily of rice, maize, and cassava, and, to a lesser extent, higher-value products including fruit, vegetables and meat (van den Berg et al. 2003; Anh et al. 2004). The near-total absence of natural areas and fragmentation of land into small plots is representative of the immense pressures on the land in peri-urban Hanoi. This can be attributed to both processes associated with traditional inheritance laws, and the modernization of the Vietnamese economy. On the one hand, tradition dictates that land-rights are divided equally between heirs, leading to increasingly small plots of land for each consecutive generation[14] (Markussen et al. 2006). One the other hand, economic growth and industrialization throughout the metropolitan region of Hanoi are creating urban sprawl, which, in turn, is increasing competition for land in the urban periphery

[12] e.g. the 1990 Company Law and Law on Private Enterprise. In the following eight years after its implementation 35,000 new companies were established throughout Viet Nam (Ho Nd.). For further information please see chapter 4.

[13] In the context of Viet Nam, dependent refers to being employed in a family business or engaged in household activities, but not formally employed.

[14] Land in Viet Nam is owned by the Vietnamese people as a whole. Organizations, families and individuals are not allowed to own land but are rather entitled to semi-permanent land-use rights, under Vietnamese law these rights can be passed on from one generation to the next (Pham 2011).

(Thapa and Murayama 2007; Nghi 2008). With the airport as a driver of peri-urban development, changing land-use patterns around Noi Bai have the potential to erode the livelihoods base of smallholder farmers (see chapter 7).

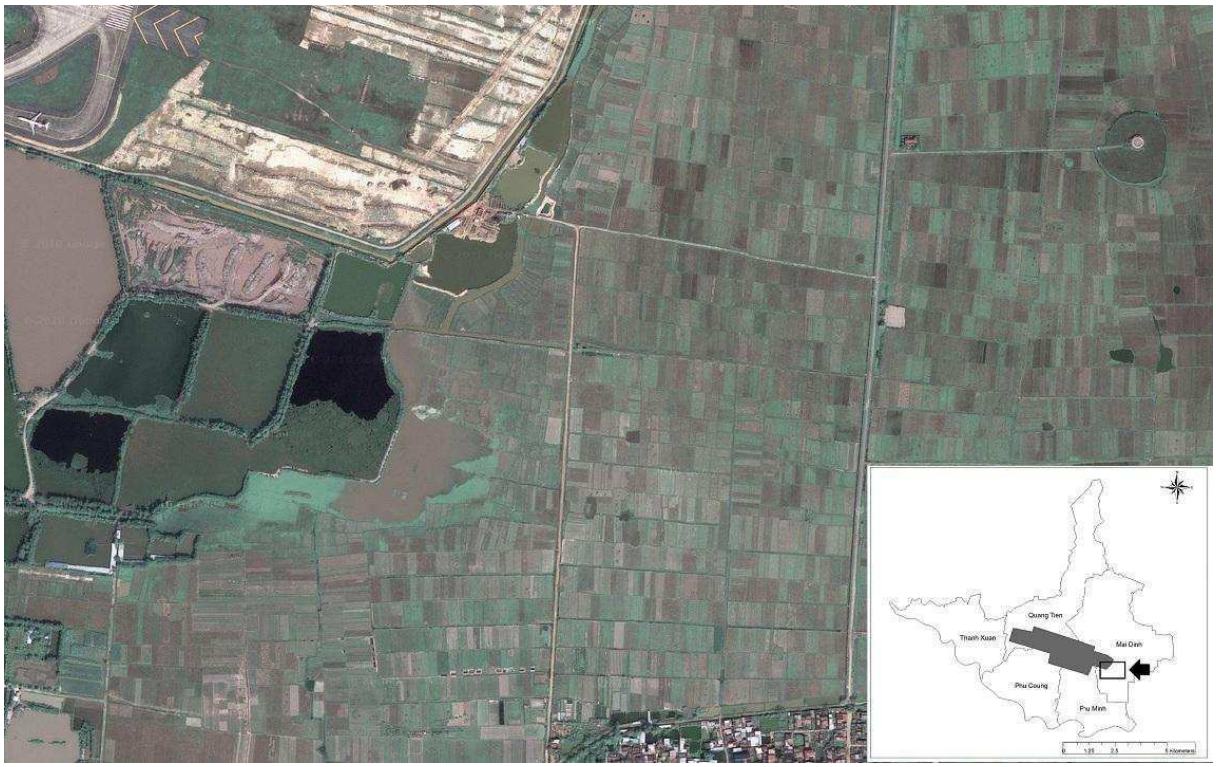


Figure 18. Smallholder Farming in Mai Dinh, Soc Son District.

The main link between the local agricultural sector and airport supply-chains is found in the sourcing of inputs for on-site catering and food services. This linkage is monopolized by the Noi Bai Catering Services Joint-Stock Company, currently the only provider of catering services to the airport.[15] While detailed information on the purchasing standards and hiring practices of the company were unavailable, the local community surveys indicated a strong link between the goods produced (mainly high quality meat, vegetables and fruit) by local farmers and the airport. When presented with the statement 'the airport increases demand for my goods and services', from a total sample of 160 farmers, 41.2 percent agreed and 24.4 percent strongly agreed with the statement (while 20 percent neither agreed nor disagreed, 13.8 percent disagreed, and one farmer strongly disagreed). These combined perceptions indicate a generally positive role of airport supply-chains throughout the local communities.

The positive attitude of farmers with regards to Noi Bai Airport may also be attributed to Soc Son District's still underdeveloped physical connectivity to the city center of Hanoi. In their study on land evaluation of peri-urban agriculture, Thapa and Murayama (2007) pointed out that Soc Son represents a medium (southern half of the district) to low

[15] Noi Bai Catering Services JSC employs roughly 600 people on a full-time basis who produce an average of 14,400 meals each day (NCS 2012).

(northern half of the district) accessibility zone. This puts farmers from Soc Son at a considerable disadvantage in terms of marketing their products and transportation costs when compared to the neighboring districts of Dong Ang or Gia Lam, all of which are more directly connected to the city center of Hanoi with its abundant street markets, food stands, and restaurants (see figure 19). Consequently, Noi Bai Airport, located at the center of Soc Son, represents a potentially closer trading partner as compared to markets in Hanoi, and can help farmers reduce transportation costs as a result of its proximity (Anh et al. 2004). Therefore it can be concluded that the benefits of indirect economic impacts of Noi Bai Airport on farmers in Soc Son Districts are heavily dependent on three factors: access to physical infrastructure, the proximity of markets, and types of crops produced.

The majority of off-site economic activities directly linked to airport operation fall within the category of services (Serebrisky 2012). In Viet Nam, about forty percent of GDP is generated in the services sector, which is substantially below the average of low income countries (~50 percent) and developed economies (>70 percent) (UNDP 2005). In Soc Son, 21.4 percent of the sample population is employed in the service sector, representing just above half the national average. The small size of the service sector is indicative of a predominantly rural economic structure throughout the district, where a focus on agricultural production does not result in significant economic diversification. Service jobs recorded in the community sample ranged from taxi drivers to mechanics, street vendors, private security guards, shopkeepers and salespersons. Due to the high demand of services at the airport, people working in the service sector demonstrate a considerably higher potential to capture value-added in airport supply-chains as compared to their peers in agriculture. In this context, Brueckner (2003) established an important relationship between airports and local economies, suggesting that for every ten percent increase in passenger traffic there will be a one percent rise in service employment around an airport.[16]

Ongoing development in Viet Nam's service industries, which recorded a growth of 6.5 percent in 2011, suggests that service industries will play an increasingly important role as employers in the coming decade (VN 2013).[17] This notion is further supported by a decline in the share of agriculture in national economic output (i.e. GDP), which dropped from 42 percent in 1989 to 21 percent in 2010 (GE 2012). As a consequence of population growth, the arrival of newcomers to the district, and urban sprawl, the availability of land for agricultural purposes in peri-urban areas is becoming increasingly scarce. At a certain point increased agricultural output will be limited by land constraints and make further investments in agriculture unattractive for local households. As the

[16] If this relationship is applied to the roughly 6,000 airport taxi drivers currently registered at Noi Bai, expected increases in passenger volumes (to over 15 million by 2015) will create 200 new taxi-related jobs alone (AVI 2011).
[17] This process can be attributed to two main factors: political reform and economic modernization.

provision of services is much less dependent on the availability of land (as compared to agriculture), this sector exhibits a high potential for growth within the study area.

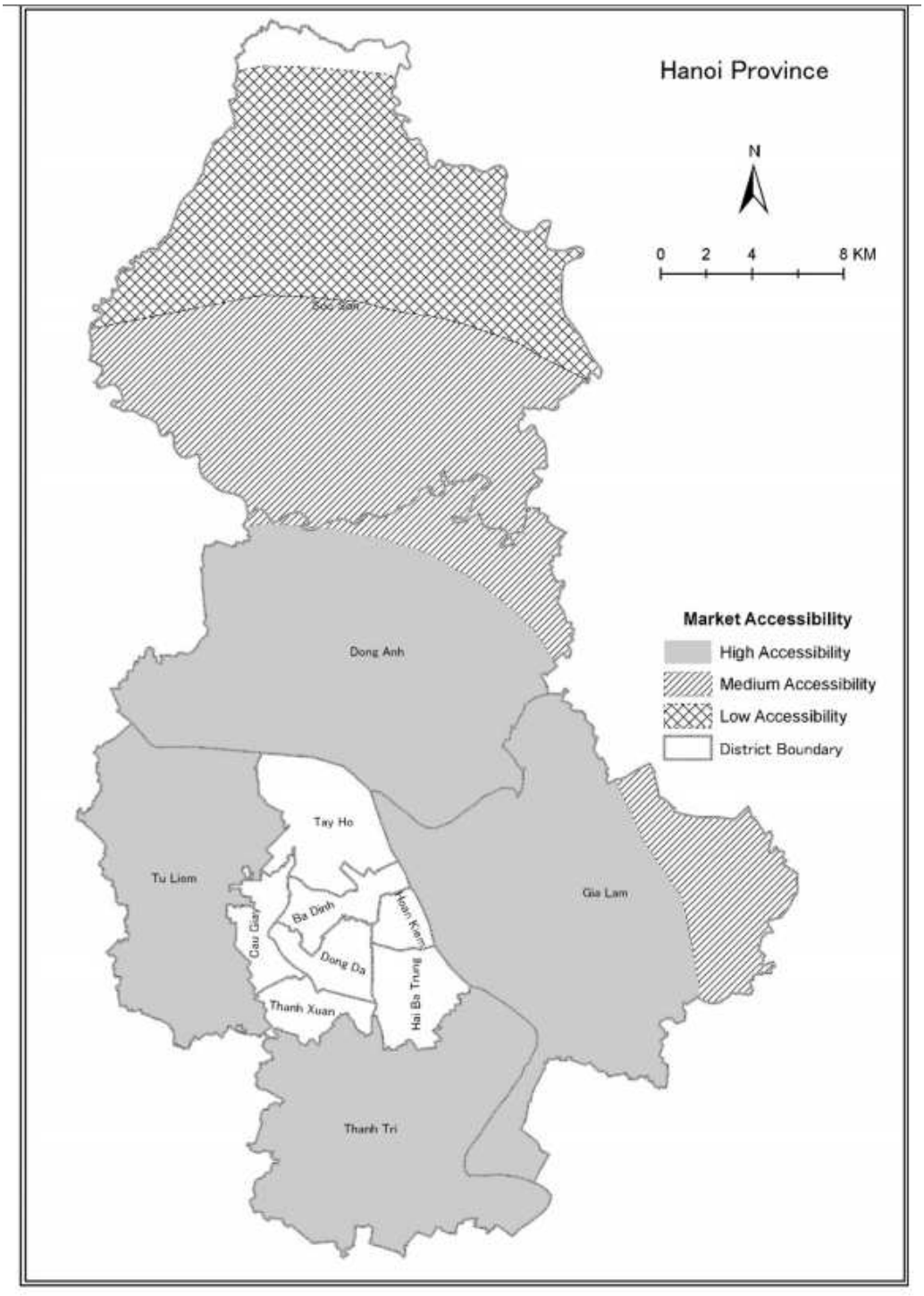


Figure 19. Market Accessibility of Peri-urban Districts Around Hanoi

The growth of services in the local economy is exemplified by the the age structure and length of employment in the sector. A majority (51.6 percent) of the sample population working in services have been employed in the sector for a period of less than five years, whereas 65.7 percent the sample engaged in agriculture have been working in the same position for more than five years. This can be indicative of two processes: first, the

services sector offers more new employment opportunities to the local population than agriculture; or second, services display a lower level of employment stability as compared to agriculture, with increased mobility between jobs. Furthermore, 37.1 percent of respondents in the service sector were below the age of 33, which represents more than twice the proportion of young people working in agriculture. This supports the notion that the service sector is indeed expanding more rapidly than agriculture. As more and more people choose to make a living in the services, competition in the sector increases. In this context more than one-in-four respondents (27 percent) from the services sector indicated that they see increasing competition as a threat to their livelihood, which is significantly higher than in agriculture (20.6 percent), manufacturing (17.6 percent), or the public sector (13.3 percent).

The expanding service sector also benefits from recent plans of the government and investors to develop modern wholesale and trading systems in Hanoi over the next decade. The development plan includes logistics service facilities in Mai Dinh and neighbouring Dong Anh District, intended to service the wider Hanoi metropolitan region (BIE 2012, TV 2012). The services sector will also benefit from the construction of large-scale amusement parks, recreational areas, and golf courses that local entrepreneurs are intending to build in Soc Son in collaboration with international investors (CWV 2011; Hoa 2012). As areas around Noi Bai develop, the diversity of services will increase, ultimately generating new employment opportunities for the people of the district. Nonetheless, these developments also present considerable challenges to the traditional agricultural livelihoods of the district by increasing competition for land around Noi Bai Airport and changing the prices structures within the local economy.

The indirect economic impacts of the airport on the local service sector can thus be classified according to a set of push and pull factors. On the one hand, push factors exist that increase the likelihood of people choosing the service sector over the more traditional agricultural sector. These include the urbanization of Soc Son as instigated by Noi Bai Airport and associated developments such as logistics centers, which increase pressures on land-use (as a common good resource) and reduce land available to support agricultural livelihoods. On the other hand, pull factors can be related to the overall transition of the Vietnamese economy, with higher wage levels in a services sector attracting younger generations who are becoming increasingly well-educated (see chapter 7). As a result, while services remain underdeveloped in Soc Son today, the sector is likely to experience the greatest benefits from the indirect economic impacts of Noi Bai.

The sections above have explored the economic composition of Soc Son District as a whole. When narrowing the scope to individual communities, noticeable differences emerge between these regarding the livelihood strategies employed by local households. Throughout the district, agriculture remains the primary economic sector (56.5 percent of total employment). In some communities, however, more of the workforce is engaged in

agriculture (e.g. 78.4 percent in Phu Cuong) as compared to others (42.4 percent in Mai Dinh). Similarly, service employment varies significantly between each community: from 8.9 percent in Phu Cuong to 38 percent in Mai Dinh. When superimposing variations in sectoral employment found in the sample onto an aerial photograph of the district, a pattern emerges between higher service employment, fewer respondents working in agriculture, and the presence of physical infrastructure in the form of road networks (see figures 20 , 21 and 22).

The theory of airport corridors (see chapter 3) helps to explain the pattern behind spatial differences of sectoral employment exhibited in Soc Son. According to this theoretical model, firms position themselves in clusters that increase productivity, accessibility to markets, and reduce transaction costs along central infrastructure spines that connect airports to urban centers. A shared characteristic of these motivating factors to form clusters is their dependence on the availability of transportation networks. In the absence of metro and rail, road networks represent the lifeline of the local economy and can help to account for the uneven distribution of service employment in Soc Son District. In this context survey settlements with a higher density of road networks also displayed a higher degree of service employment.

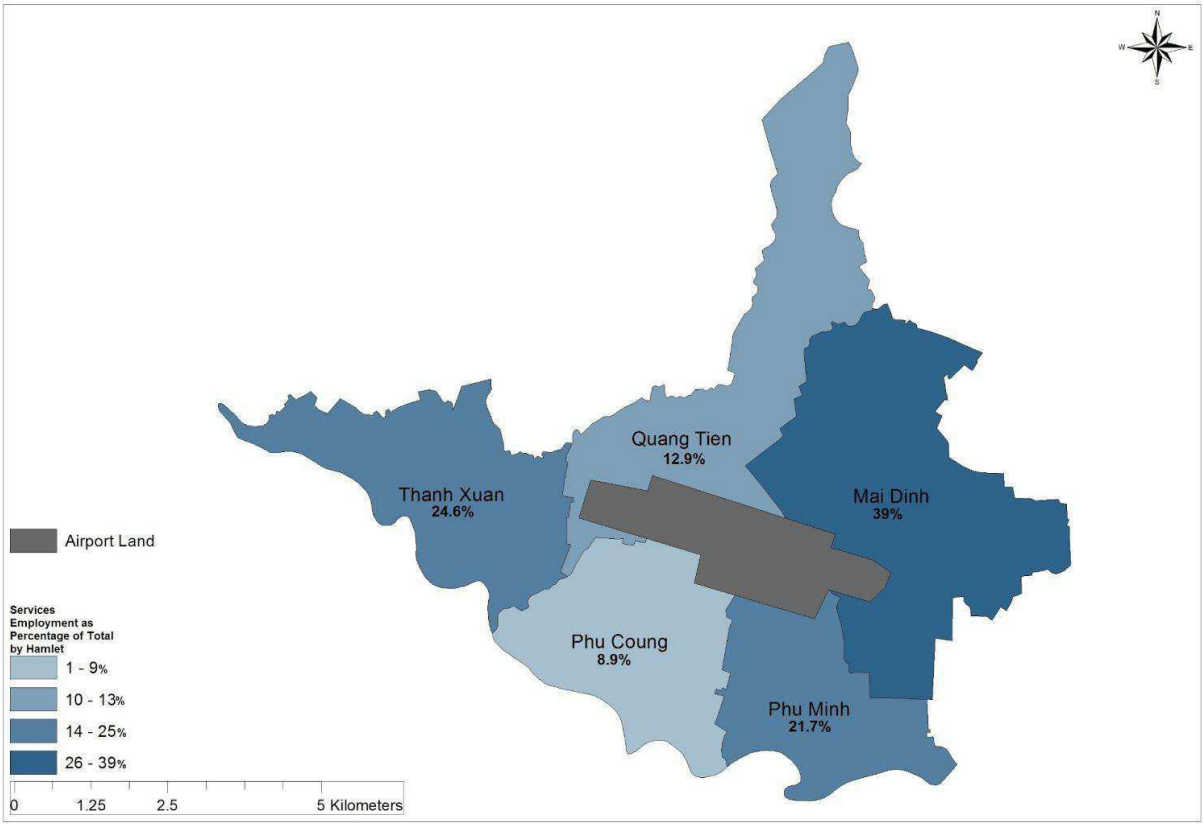


Figure 20. Service Employment as Percentage of Total by Subdistrict.

Mai Dinh (42.4 percent), for example, is intersected by major roads connecting Noi Bai Airport with Hai Phong, Viet Nam's third largest city and one of the country's most important seaports, as well as Ha Long Bay, a UNESCO world heritage site and popular

tourist attraction. In addition, the Trans-Asian Highway linking Noi Bai to northern Viet Nam and southwest China runs through Mai Dinh and neighbouring Phu Minh (21.7 percent). Thanh Xuan, the westernmost settlement (24.6 percent), is divided by a major road accessing the northeastern region of Viet Nam and the tourism destination of Son La. In contrast, communities to the north in Quang Tien subdistrict (12.9 percent service employment) do not have direct access to major road networks, and instead must transit through neighbouring communities to reach larger markets in the region.

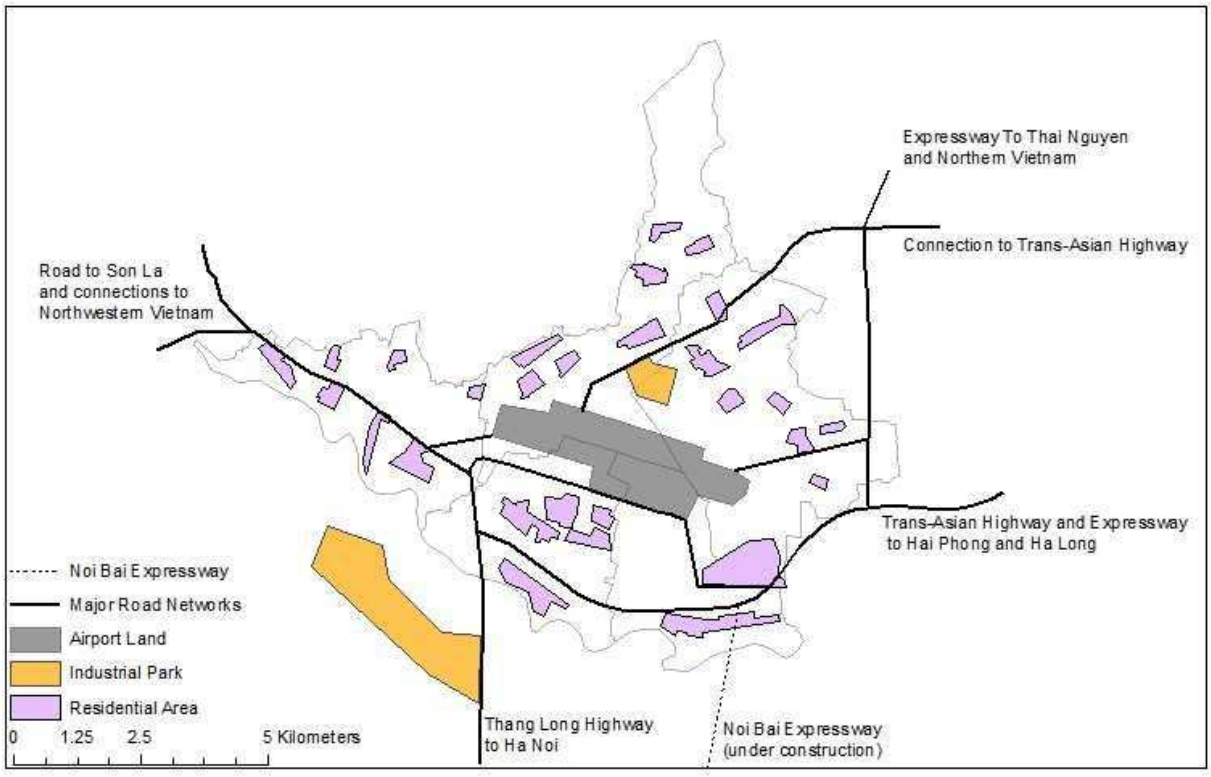


Figure 21. Major Road Networks in Soc Son District.

A distinct exception to the proposed relationship between the presence of major road networks and economic diversification is presented in the case of Phu Cuong (8.9 percent service employment). The most direct connection between Noi Bai and Hanoi is the Thang Long Expressway which runs through the middle of Phu Coung. Despite the presence of the main vein of intra-provincial transportation, only 8.9 percent of sample from the sub district are engaged in the service sector, while the majority (78.6 percent) are involved in agriculture. At first this seems to be counterintuitive to the reasoning presented above, however, it may be explained by the combination of two factors also related to the presence of physical infrastructure. First, the geographic location of Phu Cuong in relation to Hanoi's urban center combined with the direct road connection affords residents the highest degree of accessibility to urban markets of all the communities surveyed. With relatively lower transaction costs and higher market accessibility, agriculture may therefore remain the most lucrative sector of employment. Second, the largest business/industrial clusters in northern Hanoi are found along the

Thang Long Expressway, just outside the border of Phu Cuong in the neighbouring district of Dong Anh. This exposes a weakness in the applicability of the airport corridor model in an emerging economy context, as it implicitly assumes development to be evident along the entire airport-to-urban center spine. The absence of industrial development in one area and increasing development in others both connected by the same infrastructure lends more credibility to the 'airea' model, which identifies areas of airport-led development by measuring the magnitude of investments/development in specific locations at a smaller spatial scale than the airport corridor model (see chapter 3).

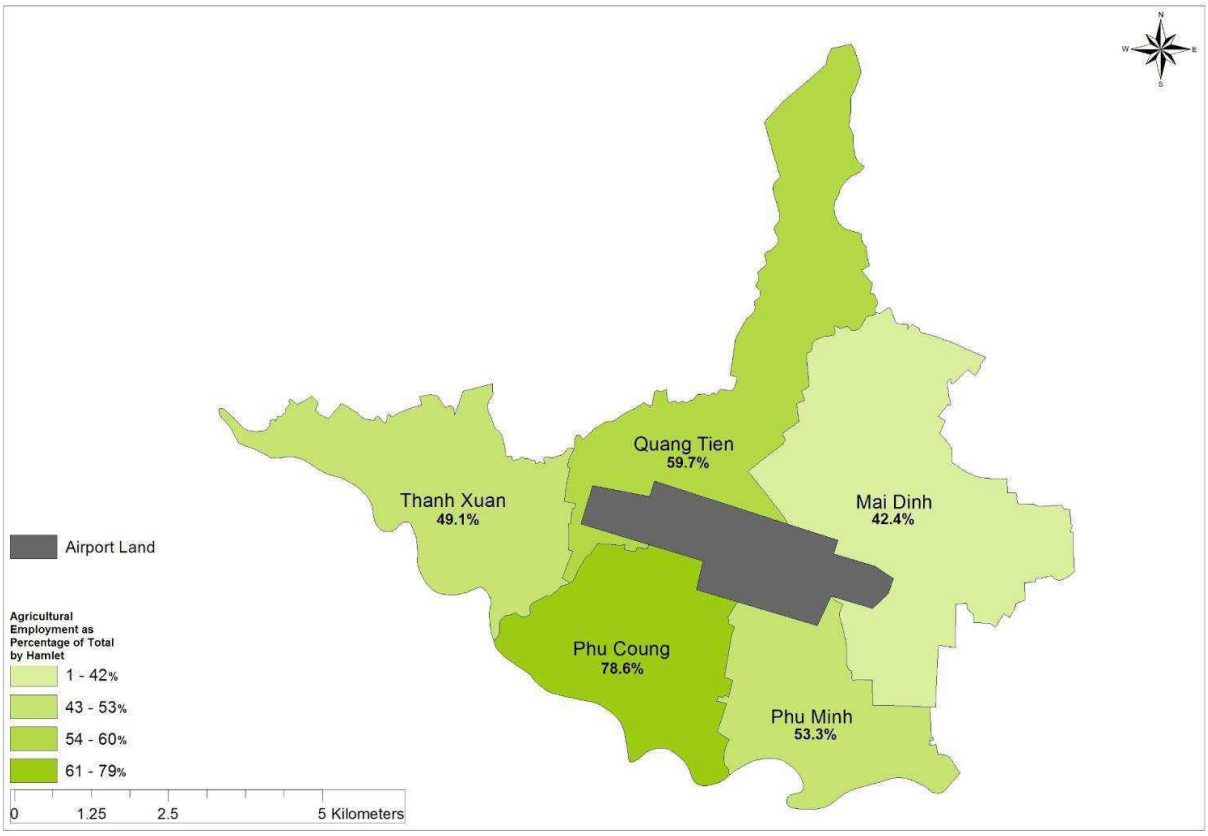


Figure 22. Agricultural Employment as Percentage of Total by Subdistrict.

The construction of the new Noi Bai Expressway and parallel metro-rail link between Hanoi and the airport, as well as the upgrading of the Noi Bai - Ha Long and Noi Bai - Lao Cai Highways, are likely to spur continued growth of the services sector, while also improving market accessibility for households engaged in agriculture (Pham 2012). The first stage (to be completed by 2015) consists of the widening of existing highways to include more lanes and the construction of the Noi Bai Expressway entering the district through Phu Minh in the South. The construction of Nhat Tan Bridge crossing the Red River will provide a more direct route between Hanoi and Soc Son.[18] The second stage (different stages to be completed between 2017-20.) will include the development of a public transportation metro-rail system with a capacity of 55,000 daily commuters between the airport and Hanoi's urban center (VNE 2012,). Combined these

[18] When complete Nhat Tan will be one of the world's longest cable-stayed bridges (IA 2012)

infrastructure projects will benefit the local communities who, during the survey, frequently complained of traffic congestion and the difficulty of transporting goods to and from the district (see chapter 7). The development of transportation networks will positively reinforce the effects of indirect economic impacts of Noi Bai Airport and foster growth in the service sector, while also improving market accessibility for agricultural producers.

Concluding Remarks - Indirect Economic Impacts

The extent to which indirect economic impacts benefit the residents of Soc Son is dependent on the capacity of the local economy to provide goods and services required to support on-site operations of the airport. Airports, as organizational entities, are primarily service-driven. It is therefore anticipated that people employed in this sector are most likely to participate directly in airport supply-chains. As the Vietnamese economy modernizes and people gradually transition away from traditional sectors such as agriculture, service employment is expected to grow rapidly. This process can already be observed at the macroeconomic level in the Vietnamese economy, which has recorded a continuous decrease in agriculture as a share of GDP in favor of the service sector. Soc Son District has been experiencing similar processes of change, but up until now at a much slower rate than the national economy.

In this context Noi Bai Airport represents a modernizing impetus for the local economy throughout the study area. The growth of the aviation industry acts as stimulus for the local economy and encourages a transition towards more service orientated production. Currently, the agricultural sector remains the dominant source of local livelihoods, however; ongoing population growth and urban sprawl originating from Hanoi will increase the pace of economic diversification. In the long run, the younger section of the population (below the age of 33) is likely to show a higher adaptability to the changing economic circumstances in Viet Nam and will profit from higher levels of education as well as increased mobility — a trend which has already started to emerge within the sample population.

Research on agricultural livelihood adaptation has also discovered an alternative trend. Despite changing land-use patterns, decreasing plot sizes, and modernization processes, large portions of the rural population employ coping strategies that do not include a transition to services or manufacturing. Rather do they choose to intensify agricultural production, plant higher value commodities such as vegetables and fruit, or start breeding livestock or fish (van den Berg et al. 2003; Lee et al. 2010).[19] These types of agricultural outputs are required by catering services in airport supply-chains (i.e. in on-site restaurants, bars, and in-flight services). Farmers who are capable of supplying high-quality products for catering can thus directly benefit from Noi Bai Airport. This presents

[19] These strategies often imply unintended environmental spillovers explored further in chapter 7

a significant opportunity for the part of the population that remains employed in agriculture and have to sell their products in the remote urban markets of Hanoi.

Noi Bai Airport thus represents an additional market for the agricultural sector of Soc Son if catering inputs are sourced locally. Inversely, farmers who cannot access these markets or provide the types and quality of produce desired by on-site catering services will not experience any added-benefit as a result of their close proximity to Noi Bai. Overall the research data indicates that the current economic composition of the study area can support supply-chains to Noi Bai to a limited extent. While farmers have the potential to partake in airport supply-chains by providing produce such as meat or vegetables, the airport and associated developments of urbanization may also lead to a slow reduction of their livelihoods basis — land. This is a process which may eventually force farming households to seek other sources of income, potentially reinforcing a gradual transition toward employment in services or manufacturing.

6.3. Induced Economic Impacts

A comprehensive analysis of the economic impacts of airports should extend beyond considering the direct and indirect contribution of airport employment and related-income on the economy within which it occurs. Rather, it should also examine the distribution of expenditures related to this income, or, more specifically, how and where airport employees spend their wages[20]. These induced impacts relate to the multiplier effects brought about by successive rounds of income spending throughout the local/regional economy as a result of the direct and indirect impacts of an airport (ACI 2004; ACRP 2008). To establish any potential patterns in the distribution of these expenditures, airport employees were asked how much of their monthly salary they allocate to a set of specific categories including accommodation, food and beverage, transportation, leisure, and education and utilities (such as electricity, gas and water). The values displayed above each bar chart in figure 23 represent the amount of respondents to the particular question.[21] Based on the assumption that expenditures on accommodation, food and beverage, utilities and transportation are unlikely to occur far from where consumers reside, it becomes apparent that a large majority of income earned is allocated to goods and services which are purchased in close proximity to places of residence of airport employees.

[20] The spending effects taken into account in this section relate to the direct income of airport employees.

[21] For example, 212 respondents indicated that they spend on average of 54 percent of their income on groceries and food services. Whereas, 144 respondents indicated they spent 21 percent of their income on accommodation.

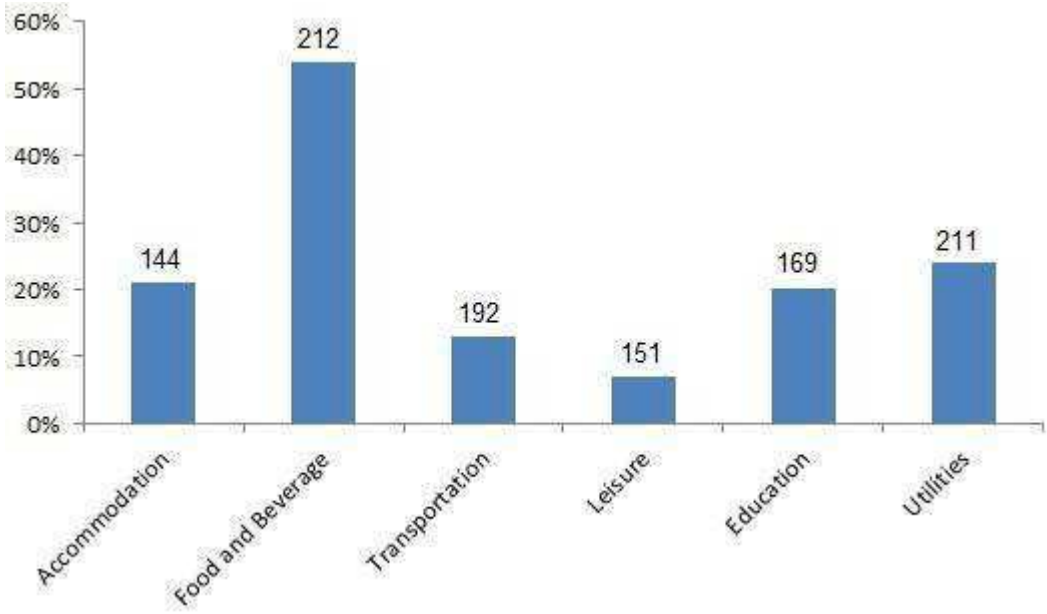


Figure 23. Percent of Income by Category of Expenditure and Response Rate (out of 274).

In order to relate where the spending habits of airport employees impact the economy of the study area[22], respondents were asked how far they commute to work on a daily basis. The answers indicate that 8.8 percent of airport employees commute less than five kilometers to the airport, 14.3 percent travel between five and ten kilometers, and 61.2 percent drive between twenty and fifty kilometers to work at Noi Bai (while 1.5 percent live beyond a distance of fifty kilometers of their workplace). Therefore the spatial data demonstrates that over three-quarters (75.5 percent) of airport employees live at a distance of more than ten kilometers from the airport. Inversely, this shows that less than ten percent of airport employees reside in the communities immediately surrounding Noi Bai Airport, in communities that were selected for the study (see figure 24).

As a result, it is likely that only a small portion of the total income of airport employees can be captured within the study area. Nonetheless, even a small portion of this revenue can represent a considerable source of income for local businesses. For example, 24.5 percent of airport workers live within a ten kilometer commute to Noi Bai. Assuming a savings rate of zero and that all income is spent locally, their contribution to the local economy would in theory exceed three million USD each year. In reality, spending on leisure and education, and to a lesser extent some of the other goods and services presented in figure 23 are more likely to benefit central Hanoi.[23] Furthermore, a vast majority of respondents indicated that they save a small portion of their income each month (see chapter 7). However, if even half of their monthly budget is spent locally, it still amounts to over 1.5 million USD captured in the local economies of Soc Son and

[22] With the objective of understanding how much of the income generated at Noi Bai is captured in the surrounding local communities.

[23] For example, cinemas, a popular leisure activity in Hanoi, are primarily located in or close to the center of the city. The same can be said of most major educational institutions.

Dong Anh each year.[24] Based on the average annual income of people living in Soc Son, this represents the annual income of roughly 1,000 individuals.

In this context data presented no major discrepancies in the income between airport employees based on the distance they live from the airport. To the contrary, the ratio between low and high income respondents was uniform throughout all spatial categories within a radius of fifty kilometers. In most categories (<5km, <10km, <20km and <50km) around ten percent of respondents earned more than ten million VND each month. Similarly, 70 - 85 percent of employees in each category received a monthly salary of more than four million VND[25]. As a consequence, high and low income residential areas in relation to the staff of Noi Bai were not identified, perhaps indicating that the purchasing power of even a lower-income airport employee allows them to settle in areas they prefer.

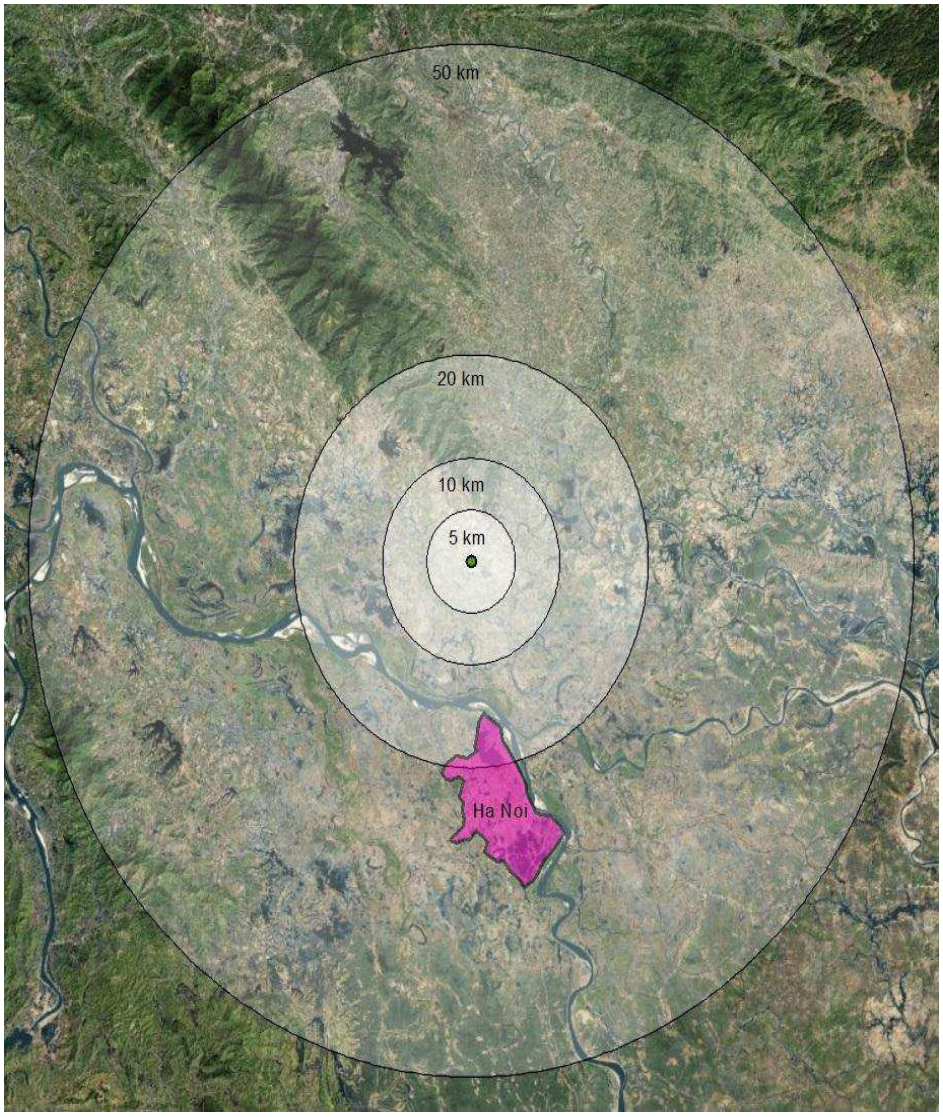


Figure 24. Commuter Distances from Noi Bai Airport.

[24] If only looking at respondents living in the study area (<5 km from the airport), and assuming they spend only half of their income locally, the contribution to economy of Soc Son would be around 600.000 USD a year.

[25] The number of people commuting more than 50 kilometers to work was too small to be representative (4 out of 274 respondents).

As mentioned previously, a large portion of the Noi Bai sample population (163 of 268), moved to the Hanoi region from other provinces, of whom 67 percent indicated they migrated primarily for economic reasons.[26] In many cases, the migrants arrive from provinces with lower average levels of income and smaller job markets. Viet Nam's General Statistics Office conducted a migration survey in 2004, which found that more than half of all domestic migrants send money or other items to their families at home (GSO 2004). These findings are confirmed by a more recent World Bank study that included a sample of 4388 internal migrants, reporting that 55 percent partake in remittance schemes representing an average value of seventeen percent of their total income (Niimi et al. 2008). The World Bank study also discovered a positive correlation between education and the monetary value of these remittances — people with a college degree sent an average of 1.4 million VND more than migrants with a lower level of education. Lucas and Start (1985) suggest that the reasons for this can be attributed to the initial expense laid out by the migrant's family to finance their education, with remittances considered as compensation. Higher levels of education can also lead to improved mobility, as is found in the sample data: 91 of the 108 economic migrants to Noi Bai had completed some form of tertiary education. This relationship reduces the amount of expenditure captured in local communities from incomes generated in on-site airport employment and shows how people within the wider national context can benefit from Noi Bai Airport. Figure 25 illustrates the origin of airport employees by province as a percent of the total workforce.

Concluding Remarks - Induced Economic Impacts

Induced economic impacts determine how income generated at an airport dissipates into a given economic system and is therefore closely linked to the direct and indirect impacts examined previously. Based on the geographic data analyzed in this section, it was found that more than three-quarters of all income generated at the airport primarily impacts areas that are located between 10 and 50 kilometers from Noi Bai. While no data could be collected for indirect induced impacts, the study proposes that indirect impacts would display similar patterns in spatial distribution, with most spending of income earned in airport supply-chains captured outside of the local communities. Overall the induced impacts of the airport have a significant economic effect on the province of Hanoi, while only a comparably small portion of this money is captured locally within the study area. At the same time this does not negate the importance of income spending/induced impacts to the local economy of Soc Son, but confirms that the economic benefits of an airport are frequently dispersed over larger spatial scales rather than being concentrated within a specific context. With the souring of airport employees from Viet Nam as a whole, remittances reinforce this process. These spatial pattern has been recorded in numerous studies related to the economic development of airports in developed

[26] 18 percent of migrants specified family and 16 percent mentioned other reasons.

countries, and can also be observed in the catalytic role of Noi Bai Airport as discussed in the following section.

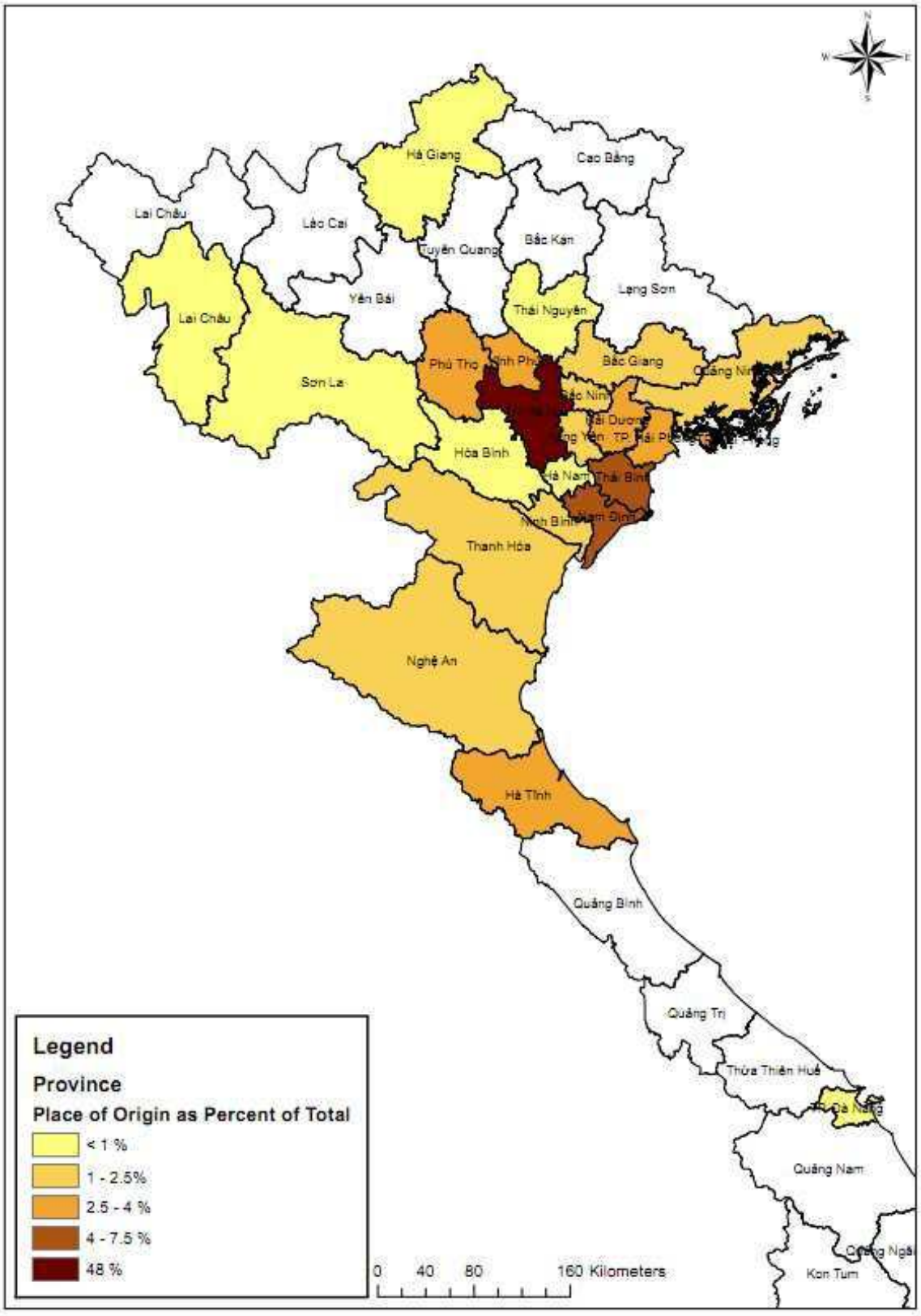


Figure 25. Province of Origin for Economic Migrants as a Percent of the Total Workforce at Noi Bai.

6.4. Catalytic Economic Impacts

Catalytic economic effects represent the furthest reaching spillovers of an airport (Halpern and Brathen 2010). They have a larger spatial scale compared to direct and indirect impacts (from the local to the global) and are the most complex, which makes their precise measurement difficult. For instance, the development of Nhat Tan Bridge and Noi Bai Expressway employs local construction workers, profits foreign engineering corporations, and impacts the regional economy in a variety of ways. The sheer volume of variables involved in a single aspect (e.g. Nhat Tan) of the catalytic impacts of Noi Bai illustrates the difficulty of accurate quantitative measurement. A broad definition of the variables taken into consideration include the "...*net economic effects (e.g. on employment, incomes, government finances) resulting from the contribution of air transport to tourism and trade (demand-side effects), and the long run contribution to productivity and GDP of growth in air transport usage (the supply-side performance of the economy*)." (Britton et al. 2005: 8). In other words, catalytic impacts represent effects related to an airport's ability to stimulate wider economic productivity, employment, domestic investment and tourism (Venckus and Gaidelys 2011; AFA 2011).

According to the OECD (2002), the socio-economic spillover effects of transportation infrastructure include accessibility (i.e. increasing the market size and quantity of social/economic activity); efficiency (i.e. establishing productivity gains through connectivity and competition); and social inclusion (i.e. resulting from better accessibility and mobility). A commonly used technique for capturing the catalytic economic impacts of airports is the cost-benefit method. It calls for the investigation of the costs and benefits associated with the production/consumption of an output or service (EC 2008). The method integrates both qualitative and quantitative variables into the analysis with the objective of increasing overall societal welfare (Rushton et al. 1999). The benefits measured include: *c*osts avoided through the use of airport services, the stimulation of recreational and commercial activities, and growth in related sectors such as tourism (ACRP 2008; Venckus and Gaidelys 2011). Amongst others, costs associated with airport spillovers include air/noise pollution and congestion (Halpern and Brathen 2010).

The following section will begin with a qualitative analysis of the catalytic impacts in the research area by exploring the perceptions of local households with regard to Noi Bai Airport's ability to generate additional economic opportunities in their communities. In order to do so, respondents were presented with three positive statements. These statements related to the airport's ability to increase demand for local goods and services, and provide income opportunities for both individuals and the greater community. Applying the analytical approach of the Psychometric Likert Scale, five answer categories ranging from 'strongly agree' to 'strongly disagree' were provided and local survey participants asked to rate the statements. By giving a numerical value to each category, the average perception could be calculated for the study area.

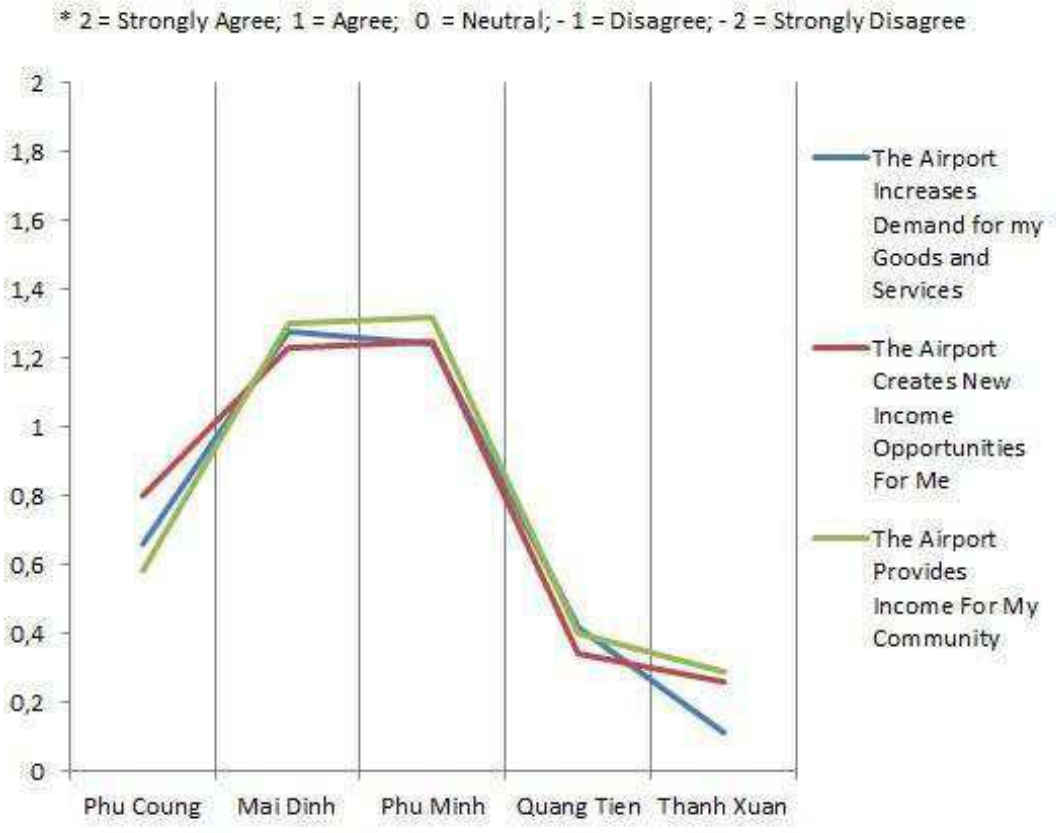


Figure 26. Local Perceptions of the Airport's Role in the Local Economy.

The results illustrate that the subdistrict with the largest service sector (Mai Dinh) and the subdistrict with the most current and anticipated investment in transportation infrastructure (Phu Minh) display significantly more positive perceptions of Noi Bai's contribution to the local economy than their three counterparts. For all three statements Mai Dinh attains a value between 1.2 and 1.4, which represents a consensus between 'agree' and 'strongly agree' (see figure 26). In contrast, Thanh Xuan and Quang Tien, located to the west of the airport, remain close to 'neutral' (o.1 to 0.4) and residents of Phu Cuong represent the middleground (0.6 to 0.8) between the more and less positive neighbours bordering to the east and west, respectively. The data provides a correlation between the recent and expected airport-related investments in the communities and their perception of its ability to stimulate demand for local goods and services: communities experiencing more development were also, on average, more positive of the airport's role as a catalyst in the local economy.

The relationship is also supported by negative responses of those who strongly disagreed or disagreed with the statements. In this context a strong link emerged between negative perception, age, employment sector, and accessibility. The group that most strongly disagreed with the statements consisted of agricultural workers above the age of 50 from the sub-district of Quang Tien. In contrast, the most positive perceptions regarding the airport came from respondents under the age of 33 employed in the services sector in Mai

Dinh. With regard to accessibility, communities with more direct access routes to the airport and the city-centre of Hanoi (Mai Dinh, Phu Minh and Phu Cuong) were more positive than those without (Quang Tien and Thanh Xuan). Similarly, when respondents were asked if they would like to see more investments in the airport, 92 percent of the sample indicated 'yes'. This supports the overall positive perception of the airport found in responses to the three statements explored above. Perhaps more importantly, of the 8 percent who did not want to see further investments in the airport, the majority were employed in agriculture and over the age 50, but none came from Quang Tien.[27] This may indicate that while residents of Quang Tien are frustrated that airport-related investments have been concentrated in neighbouring districts, they would like to see investments that are inclusive of their community.

The overall positive attitude to the economic role of Noi Bai Airport was reflected in additional comments in the local community questionnaire. Here respondents referred to the airport as a positive stimulus for the local economy, notably with many of the positive responses praising the creation of local jobs for future generations. Furthermore, respondents stated that because of developments related to the airport it was becoming easier to transport goods to local markets, and in general that travelling locally was becoming more convenient. There were also numerous negative comments, almost none of which referred to economic aspects of the airport, but rather to the environmental spillovers of airport operation, including noise and air quality. A discussion of the environmental impacts will be briefly touched upon in this section, with a more in-depth focus on the subject found in chapter 7.

A second method of measuring the catalytic impacts of airports are land prices (Sheppard and Stover 1995; Cech 2004). In recent years, Soc Son District has experienced what many reports labelled as 'land fever', sparked by rumors of large-scale investment plans of the Vietnamese government to improve the infrastructure connection to Noi Bai Airport, build new hospitals, relocate universities, and create tourism attractions (TND 2011; CBV 2011; SGGP 2011). While the transfer of agricultural land rights for monetary gain is not permitted by Vietnamese law, illicit trade does occur routinely. In 2010 the price of undeveloped land averaged between 13 and 15 million VND per square meter in suburban Hanoi (TND 2011). More recent data from Soc Soc (and adjacent Dong Anh) shows that the price of land had reached figures between 20 and 50 million VND per square meter, representing a significant increase from previous figures (SGGP 2011). The inflated prices are caused by speculators and investors, who, in the hope of current and future infrastructure investments, attempt to buy land on a large scale. It is estimated that as a result of current market conditions only five percent of of the local population in Hanoi can afford to buy private property (Kato and Nguyen 2010).

[27] All 62 respondents from Quang Tien indicated they would like to see more investments in Noi Bai Airport.

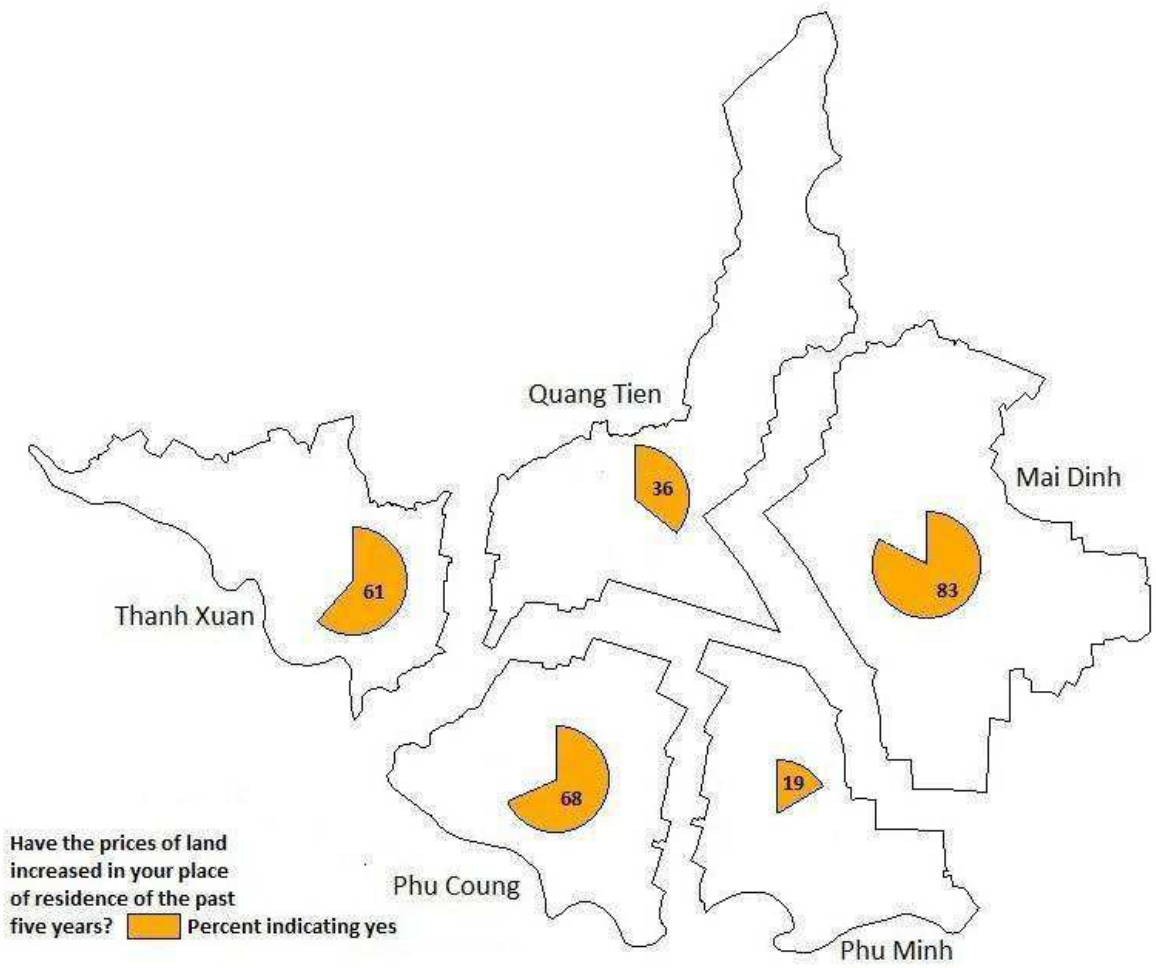


Figure 27. Land Price Increases According to Residents of Each Community.

More than half of all respondents (51.1 percent) indicated that land had indeed become more expensive in recent years. In this context answers varied significantly between the different communities, with 83.1 percent of residents in Mai Dinh indicating increasing land prices as compared to only 19.2 percent of people in adjacent Phu Minh (see figure 27). While the findings may be distorted by a reluctance of respondents to confirm they participate in illicit markets or had information on land prices, the data generally conforms with areas that are expected to, or are currently experiencing, higher rates of development. For example, the construction of the Noi Bai Expressway intends to transfer the main point of entry to the airport from Phu Cuong to Mai Dinh, while the planned construction of large-scale logistics facilities in southern Mai Dinh puts additional pressure on the land (see figure 28)[28]. In other sub-districts, respondents were willing to elaborate on the effects of more expensive land on local households in an open question format. The responses were split evenly between those who could sell land-rights and improve their quality of life, those who felt the high prices made it impossible for them to buy land or expand their property, and those who stated it had no impact on their daily

[28] Interestingly, no respondent from Phu Minh working in agriculture indicated that prices were increasing, which is surprising considering that the new Noi Bai Expressway passes through the middle of the community. This perhaps further indicates their aversion to acknowledge to outsiders the existence of a 'gray' market for land.

lives. Further discussion on the importance of land for local livelihoods can be found in the physical capital section in chapter 7.

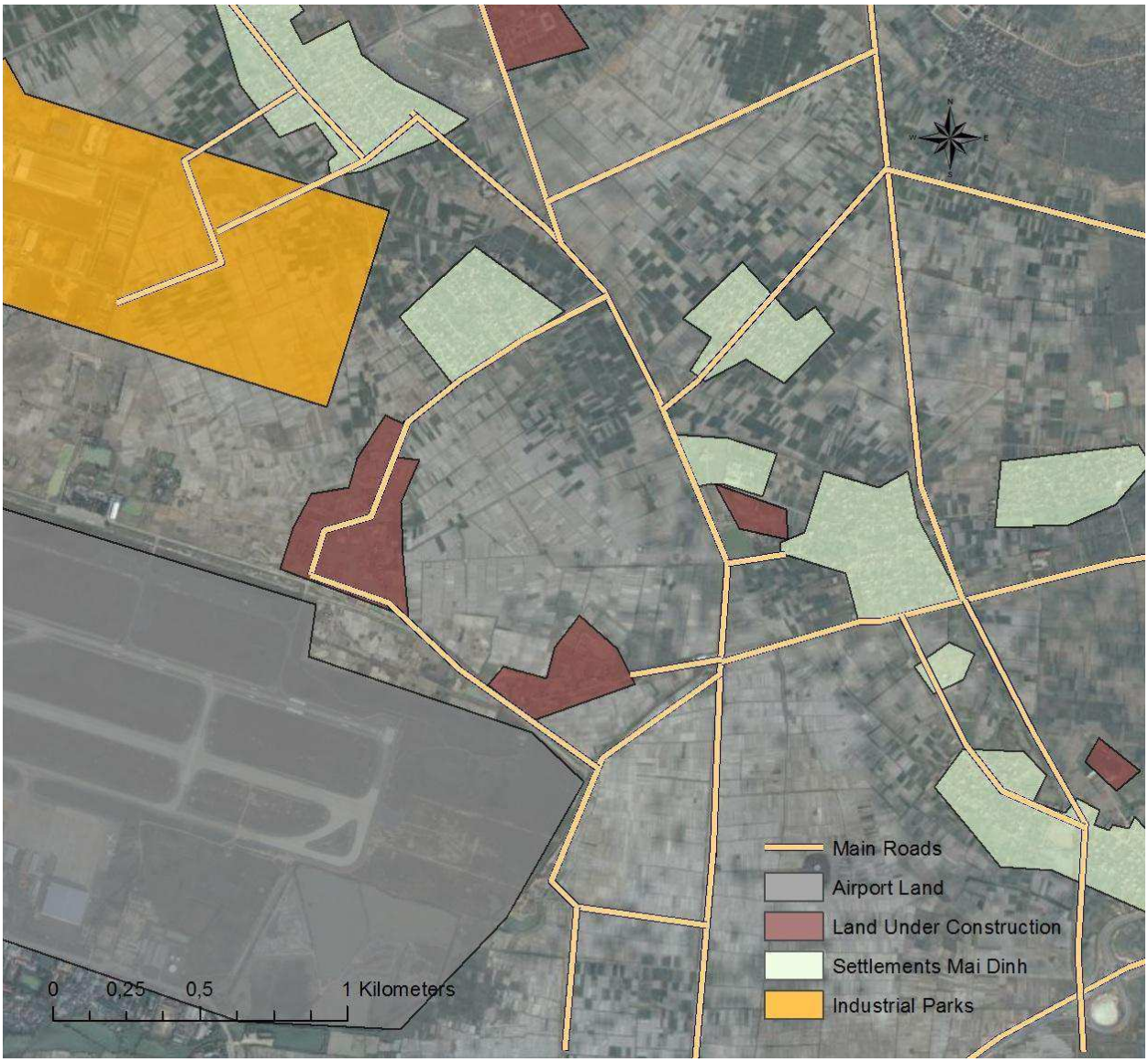


Figure 28. Land Use Competition in Mai Dinh.

Another factor leading to increasing pressure on land in peri-urban Hanoi is the emergence of large industrial and business parks. Over the last two decades, modern airports have assumed many of the commercial functions of central business districts (CBDs) and attract a wide array of multinational companies that depend on aviation-related services in their supply-chains (Derewicz 2011). These commonly form corporate clusters and business parks in the vicinity of the airport and along major highways that provide connections to urban centers and central markets. This phenomenon and aspects thereof have been described in multiple theories of airport-led development (see chapter 3). Figure 29 displays the distribution of industrial zones in the study area and beyond. Combined these have a total surface area of 1200 hectares, more than half of which are currently utilized for industrial production. The industrial zones around Noi Bai and Hanoi are home to 265 Vietnamese companies and 245 foreign multinationals. These

originate from countries around the globe, and include, amongst others, companies from Japan, China, Korea, Malaysia, Thailand, Singapore, Taiwan, and the USA primarily involved with electronics and mechanical engineering (Nguyen 2012a).

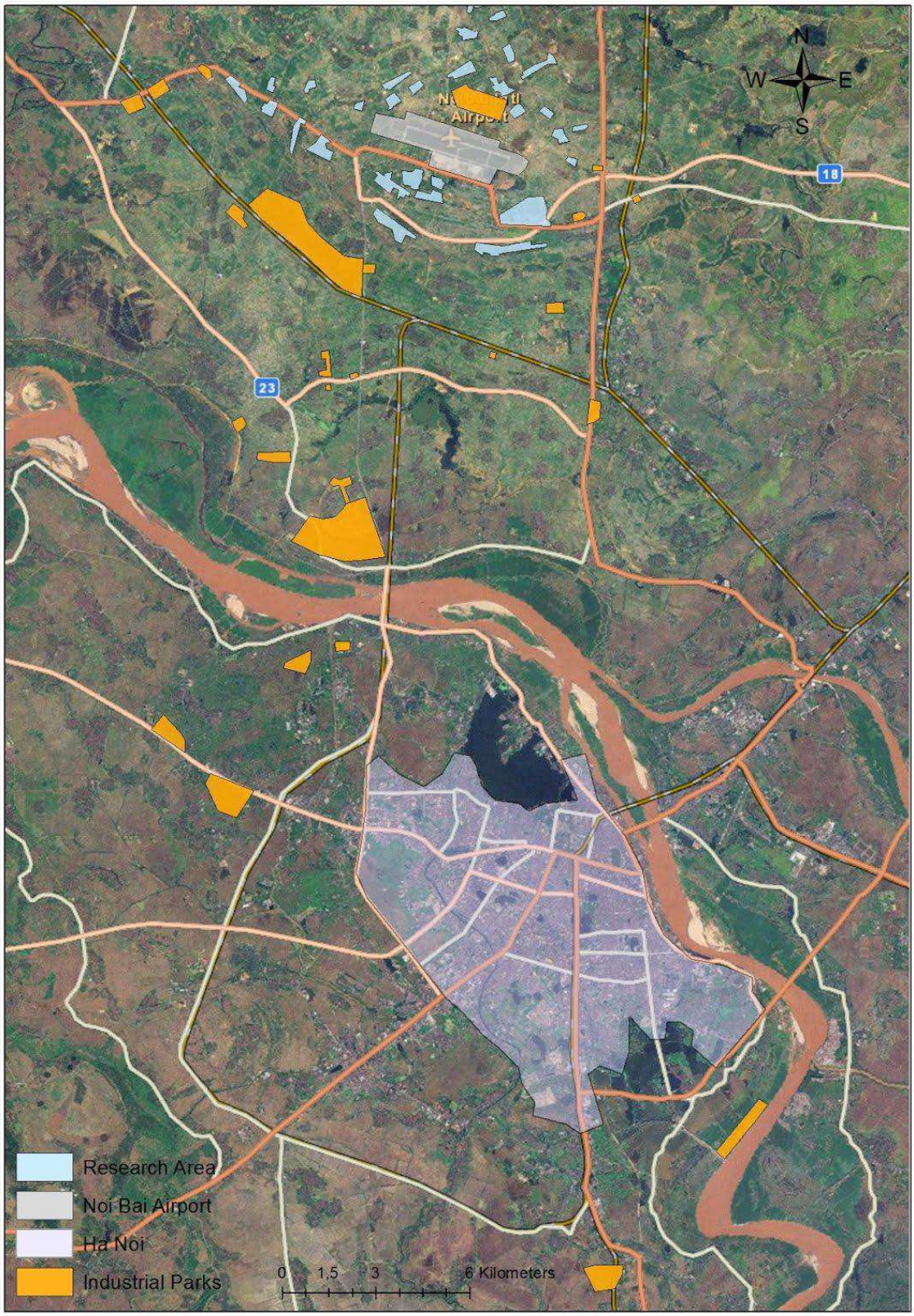


Figure 29. Industrial Zones in the Greater Hanoi Metropolitan Region

Combined all industrial parks in and around Hanoi provide employment for more than 100,000 people and bring a total investment value of USD 3.6 billion to the province (Nguyen 2012c). The most widely-known companies investing in Hanoi are Canon, Panasonic and Yamaha. Notably, the majority of industrial zones are located within a fifteen kilometer radius of the airport and within the airport corridor, along the main roads joining Hanoi to Noi Bai. Noi Bai Industrial Zone (NBIZ), a 100 hectare free-trade facility that was established in 1994 is located in the center of Soc Son district (HT 2008). According to plans published by the Vietnamese government, NBIZ will expanded in the near future, directly impacting resident of Quang Tien and Mai Dinh. NIBZ is currently home to 39 multinational corporations who employ more than 15,000 people, more than half of which come from the region (BLIP 2008).

Despite the strong growth of FDI-based industries and manufacturing in the region, only 5.8 percent of people in the Soc Son District sample were employed in manufacturing-related jobs. These employees exhibit considerably higher levels of income when compared to local and regional averages, with 29.4 percent earning over 4 million VND (as compared to 7.2 percent in agriculture and 22.2 percent in services). With 94.1 percent of manufacturing employees in the sample working within ten kilometers of their homes, and 87.5 percent of these same workers indicating that they have always lived in the area, the sector is indeed offering new employment opportunities to local residents. However, these are primarily offered to younger generations (under the age of 33) and those who have not attended high school[29], perhaps supporting the commonly-referenced motivation of multinationals to establish operations in Viet Nam based primarily on low wages and the abundance of low-skilled labour (Harrison and Scorse 2004).

Between 2005 and 2010 Viet Nam has achieved a compound annual growth rate in manufacturing of 9.3 percent[30], compared to 8 percent in services and 3.3 percent in agriculture (Breu et al. 2012). Industrial zones in peri-urban Hanoi have developed in patterns closely related to the location of the airport, illustrating the catalytic potential of the aviation industry to generate employment beyond their own industry and spur development in emerging economies. Currently, employment in manufacturing remains comparatively small in the research area, however, it offers economic diversification in a predominantly agricultural society, creating additional places of work that can complement traditional rural incomes. As in the services sector, this study observes the trend that it is mainly the younger generations that profit from these processes, while the older generations are likely to remain employed in the agricultural sector. Ongoing regional integration within the ASEAN, trade liberalization, and comparably low labor

[29] It is interesting that the sector offers higher wages when compared to other forms of local employment, contradicting the positive relationship between education and income found in other sectors.

[30] It is the explicit goal of the Vietnamese government to turn the country into an industrialized society by 2020. In their development strategy the government focuses on the following industrial sectors: electronics, automotive, information technology, textiles, agro processing and chemicals (BW 2011).

costs will all contribute to turning Viet Nam into one of the main manufacturing hubs in Southeast Asia and beyond (ibid).

Tourism represents another powerful catalytic impact related to the aviation industry and airport operation (ACI 2004). In 2010, tourism accounted for approximately twelve percent of global gross domestic product and the industry continues to grow each year (WTO 2010). By 2020 international arrivals are expected to exceed 1.6 billion, which represents a significant increase from the 922 million tourists of 2008 (UNCTAD 2010). The forecast suggests that the development of tourism services in destinations such as Viet Nam can offer future economic growth on a foundation of natural and cultural capital. Tourism's contribution is not limited to generating income; it can also create a strong disincentive for continued poverty, corruption, and instability, which constitute strong deterrents in the decision-making process of international consumers within highly-competitive tourism markets (Honey and Gilpin 2009). Furthermore, the tendency of tourism to preserve natural capital and culture within host countries is unrivalled by other large industries (Chook and Macbeth et al. 2009).

In 2011 more than eighty percent of tourists arrived by air in Viet Nam, exemplifying the strong relationship between air travel and the tourism industry in the country (VNAT 2011).[31] Expanding at an average rate of 19.1 percent between 2010 and 2011, the continued growth of tourism in Viet Nam will thus rely heavily on the infrastructure of thee three international airports of Noi Bai (Hanoi), Tan San Nhat (Ho Chi Minh City) and Da Nang to provide global market access (ibid.). The Vietnamese government has acknowledged that existing transport infrastructure, particularly airports, are insufficient to accommodate current and expected passenger volumes. In order to address the rising demand, the government is expanding the aviation facilities at Noi Bai and Da Nang to ensure that poor infrastructure does not constrain the growth of the national tourism industry (BMI 2012). Currently, the South of Viet Nam receives considerably more arrivals than the North, where beyond Hanoi and Ha Long Bay there are few developed tourism destinations despite plentiful natural capital. This lack of development is in part addressed through foreign development aid: the eight northern provinces of Viet Nam have received USD 14.3 million from the European Union to invest specifically in transportation infrastructure. (ibid.).

At this moment there exist three large scale-projects related to tourism development in Soc Son District. First, there is the Legend Hill International Golf Resort whose construction commenced in March 2010 and has a total investment volume of USD 100 million. It is a 36 hole facility that includes hotels, entertainment complexes, restaurants, holiday villas and residential villas, with the explicit goal of developing tourism, leisure, and local land-use efficiency (BRGG 2012). Second, the Vietnamese government

[31] 5,031,586 out of 6,014,032 total arrivals.

published plans to build a major leisure and entertainment park in Soc Son, including recreational areas related to horse racing, and motorsports (CWV 2011). Third, small tour operators have started to explore sustainable tourism options 'off the beaten path' that enable foreign visitors to experience traditional village life, temples, and natural sights throughout the district and nearby Tam Dao National Park (Hoa 2011; BM 2012). In what ways these developments impact Soc Son remains to be seen. However, as a representative of the local population Ms. Tran Thi Du (2012), the President of the Women's Union of Soc Son suggested that given recent developments and ongoing investments in recreational facilities, she was optimistic about the role of tourism in the study area. She also confirmed that historical and religious sites already offer income to some local entrepreneurs who provide guided tours from hotels in the central Hanoi, but remain underdeveloped. It is estimated that in the Asia-Pacific region around eighteen million jobs are dependent on the catalytic impacts of travel and tourism (ATAG 2012b).

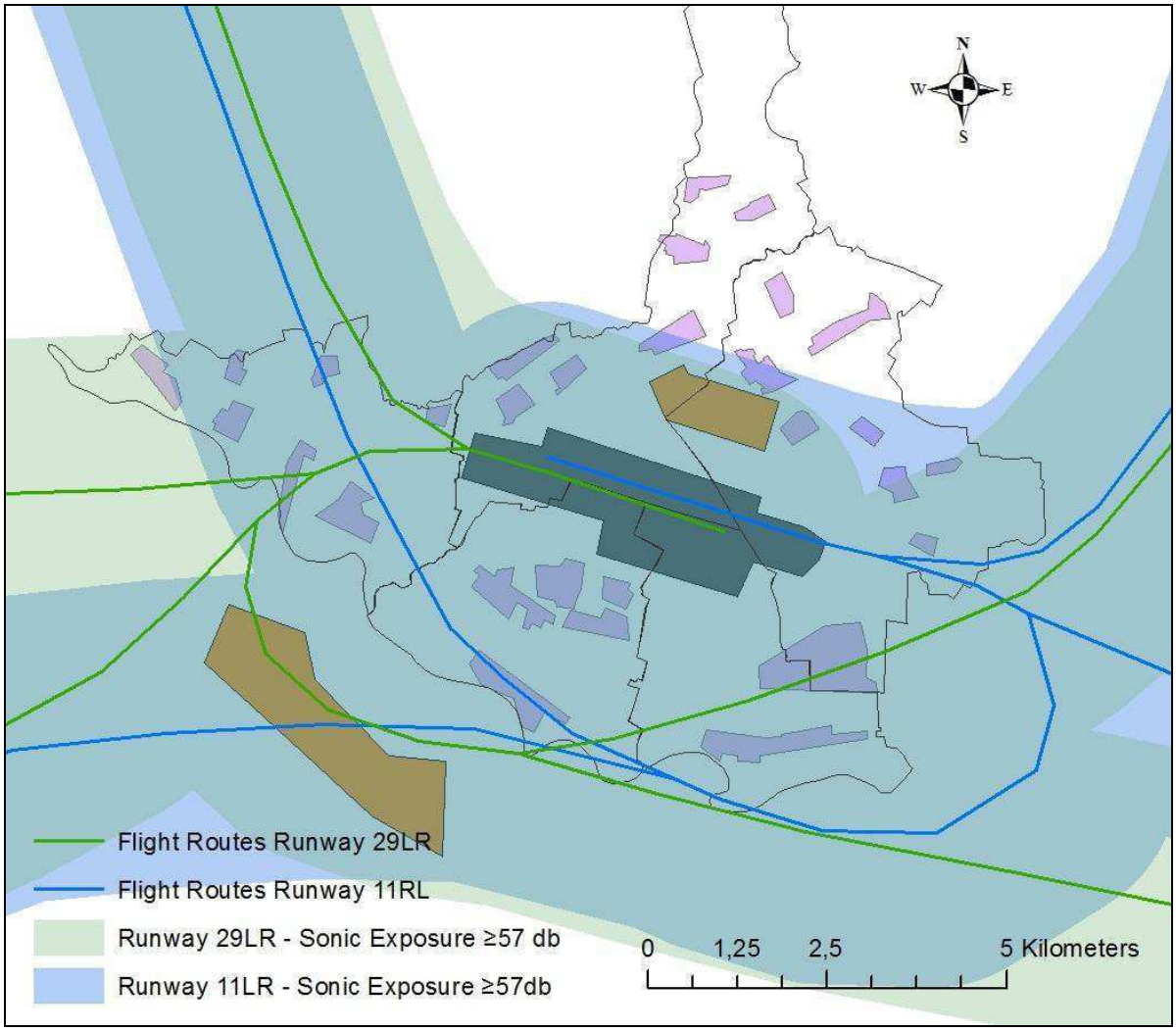


Figure 30. Aircraft Noise Emission around Noi Bai Airport (based on Nguyen 2012b)

In this context, one negative impact related to travel and trade are the emissions of the transport industry. While environmental impacts of aviation are rarely measured in the context of economic impact analyses, the research follows the rationale of Britton et al.

(2005: 9), who stipulate that catalytic impacts can be defined as "...*all other benefits and costs associated with an airport or the air transport sector*..." including environmental impacts. Among these, noise emitted from aircraft operation and its effects on human health, quality of life, and property values is the most frequently investigated field (e.g. Luther 2007; Arafa et al. 2007; Lijesen et al. 2010). The most common measurement of aircraft noise is the 'LAeq', or equivalent continuous noise level. This means that noise levels at airports are averaged out over the course of one day (or any other given period). Research indicates that people start growing concerned about aviation-related sounds if these average 57 decibel or more (LAeq) over a sixteen hour period (GAL 2011). Figure 30 displays the flight routes of passenger aircraft arriving at and departing from Noi Bai Airport and the areas affected by aircraft noise.[32] While noise levels vary depending on aircraft type, wind conditions and take-off/landing angle and current elevation of the aircraft, it serves to show that the majority of survey settlements in the study area are exposed to aviation-related noise.

Noi Bai Airport registers up to 250 flight movements per day (divided into arrival and departures), or around 10,5 flights per hour (Ngyuen 2012c). While the majority of these occur during daytime hours between 9am and 9pm, there is no ban on night time flights as found at many European or North American airports. When comparing these figures with the perception of survey participants, more than half of the sample rated their aural environment as 'very poor' or 'poor'. Only ten (of 305) village residents do not feel disturbed by noise emanating from aviation-related activities and refer to the surrounding noise levels as 'good'. Residents from Quang Tien and Thanh Xuan especially perceive Noi Bai Airport as a source of noise, with more than 90 percent of respondents from each community rating this environmental indicator as 'poor' or 'very poor'. Furthermore, a significant number of respondents specifically mentioned aircraft noise as a source of anger and stress that negatively affects their livelihoods.

Concluding Remarks - Catalytic Economic Impacts

The importance of Noi Bai Airport to the development of Hanoi, its greater metropolitan region, and Viet Nam in general is exemplified by its' role as a catalyst of economic growth. The overall positive attitude of local community residents with regard to the airport demonstrates that large-scale infrastructure projects can be associated with modernization and new opportunities, which, by many, are seen as investments in the future. Therein people associated the airport with better marketing opportunities for their products and as a creator of new jobs in the area. A commonly observed side-effect of economic development and modernization is an increase in the price of land - a process which has also been acknowledged in the survey. Crucially, it seems that the majority of farmers (as they are typically hold land-rights) are able to profit from this process, either by renting out rooms to newcomers or selling their land rights. As a down side, only a

[32] The sonic pressures within a two kilometer radius around a flight path commonly range from 57 decibel at the farthest point to above 85 decibels at its closest proximity (Arafa et al. 2007).

small proportion of local residents are now able to buy land themselves or expand their houses. Similarly, tenants in rental accommodations struggled to afford increases in rent, and those who are tempted to sell their property may be increasingly marginalized if they struggle to find employment that does not depend upon the ownership of land (i.e. farming).

One of the most powerful catalytic effects related to airports and their operation is tourism. This industry has undergone tremendous growth in Viet Nam and employs a diverse range of workers, from taxi drivers to street vendors and tour guides, just to mention a few. Without further airport development, international visitors to the country would likely prefer other more convenient destinations in Southeast Asia and the Vietnamese tourism industry would cease to expand at current rates. In addition, as the most efficient means of long-distance transportation, the airport enables the expedient movement of people, goods and technology around the world. This has enabled the establishment of various industrial parks and special economic zones around Noi Bai, which focus predominantly on the production of electronics and other goods for export, bringing new employment opportunities and skills to both the airport region and Viet Nam. The sheer complexity of catalytic impacts makes measurement difficult; however, as most of the factors mentioned above are dependent on or related to the airport as a portal to global markets and supply chains, it is assumed that the economic impact of Noi Bai is fundamental to the overall economic well-being of the greater Hanoi region and Northern Viet Nam.

6.5. Conclusion Economic Analysis

The direct, indirect, induced and catalytic economic impacts of Noi Bai Airport combined constitute the total economic impacts experienced by the local population of the study area and beyond. The findings demonstrate that the economic composition/outlook of the local economy and its people strongly determines the way in which these impacts are absorbed, both positive and negative. While at this point the participation of local communities in on-site activities remains minimal, airport-related supply-chains have the potential to pass through the local economy and offer both markets and employment opportunities for local populations. Similarly, the induced impacts of expenditures made by income generated in airport-related activities are felt at the local level; however, as most airport employees (who by definition provide this monetary input into the economy) live dispersed over larger spatial scales, these benefits occur predominantly at the regional level throughout Hanoi province. With continued growth of the airport and the stronger integration of the local population into the workforce at Noi Bai, the level of this expenditure being captured locally could increase substantially.

As the main gateway to northern Viet Nam and a stimulus of economic modernization, including tourism development, foreign direct investment, and urbanization, these

processes cause increasingly well-educated, younger population groups to seek employment in the more advanced and better paying services and manufacturing sectors. Therein the economic development of the study area also benefits from investments in airport-related infrastructure such as public transportation, road networks and recreational facilities. However, depending on the access to and availability of different livelihoods capitals, the impacts of the economic changes taking places in the study area are not felt equally between all demographics. Especially people in the more traditional agricultural sector display a relatively higher vulnerability in this context. The following chapter will examine how the socio-economic impacts are spread amongst local residents, and what the determining factors are for people and households to either benefit or be negatively impacted by the presence of Noi Bai Airport.

7. SOCIAL IMPACT ANALYSIS by Jes Halim Nauckhoff

Social impact assessment is a process that seeks to analyze, monitor, and manage the "*…intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions* (Vanclay 2003, 6)*"*. In this study planned interventions refer to the operation and development of Noi Bai International Airport and related developments in its' periphery. Within this context, social impacts can be defined as the consequences of actions taken at the airport that affect "*...the ways in which people live, relate to one another, work, organize and generally cope as members of society* (Burdge and Vanclay 1995, 59)*."* More specifically, these relate to people's aspirations and perceptions, health and well-being, environment and resource-base, culture and customs, as well as the socio-political system in which they participate (Vanclay 2003; Taylor and Bradbury-Jones 2010).

In the absence of well-established models of social impact assessment applicable to airports (especially within the context of emerging economies)[33], the livelihoods framework offers an alternative approach to understanding the complex processes affecting communities and households that live next to large airports. By using a livelihoods framework the complexity of interrelated processes can be structured in a well-defined system of separate but interrelated components that together influence the distribution of impacts. This disaggregation facilitates the identification of factors that can support adaptability to changing socio-economic circumstances, while also highlighting processes that reinforce or increase local vulnerabilities as the influence of Noi Bai Airport grows in Soc Son.[34] Furthermore, the framework emphasizes the creation of working days, poverty reduction, increased well-being and capabilities, adaptation, and natural resource base sustainability (Scoones 1998; Morse et al. 2009; Richards 2010; Schreckenberg et al. 2010). The inherently pro-poor nature of the framework is supportive of the research objective to determine how processes associated with airport operation in developing countries can be harnessed to provide the greatest benefit to the local communities.

The following chapter aims to identify which socio-economic characteristics of local households and people facilitate adaptability to the changes occurring in Soc Son. A combination of the quality and quantity of livelihood assets available and accessible to households influence their responses and ability to cope with processes related to the

[33] Social impact assessments of airports in developing countries can be found in, for example, studies on Sharm el Sheik International Airport, or Monastir and Enfhida International Airports supported by the African Development Bank (Ali et. al. 2011; Bilge and Cisse 2008). However, publically-available social impact assessments of airports are uncommon, seldom share similar methods or a common framework, and are rarely approached from a human development perspective.

[34] A livelihood consists of the "*...capabilities, assets (stores, resources, claims and access) and activities required for a means of living; a livelihood is sustainable which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long-term."* (Morse et al. 2009, 4).

airport (DFID 1999). Each type of capital (human, financial, physical, social and natural) will be investigated using data collected in the local community sample. At the same time as access to the different capitals can influence the capacity of people to attain the outcomes they aspire to achieve in the face of pending airport expansion and development, the airport itself can influence the availability of some capitals. The continued development of Noi Bai will, in some cases, radically reshape the capital base available to households. Depending on the set of capitals that people are accustomed to deriving their livelihoods from, some will benefit while others are likely to experience the presence of the airport as detrimental to their way of life. The objective of the social analysis is to determine which types of people are the least adaptable and most vulnerable to developments in Soc Son related to Noi Bai, in order to (in later chapters) assess how processes at the airport, both current and planned, can potentially be reshaped to reduce their footprint in local communities.

7.1. Human Capital

Human capital can be measured by both quantitative and qualitative variables. The quantitative type consists of the number of household members and time available to participate in income-earning activities (Rakodi and Lloyd-Jones 2002; Scoones 1998). The qualitative type refers to the level of education, skills, and knowledge attained by, and available to, household members to generate economic value (Dae-Bong 2009). The following section focuses primarily on the qualitative aspects, adopting the human-capital measurement used by the OECD, which interprets education-related indicators as the basis for economic, social and personal well-being (Keeley 2007). The focus on education is derived from the objective of better understanding the capability of local households to adapt to changing economic structures in the periphery around Noi Bai — changes that can often be linked, either directly or indirectly, to the presence of the airport (see chapter 6). The capacity of people to engage in the more modern sectors of employment in Soc Son, as well as the ability of households to 'reinvent'[35] traditional agricultural strategies are highly dependant on the availability of human capital.

As the first component of the quantitative analysis, households throughout Viet Nam have been steadily decreasing in size over the past three decades, from an average of 5.22 persons in 1979, to 4.61 in 1999, and most recently 3.8 people per household in 2009 (Nguyen 2011). The slow dissolution of the traditional family model, where several generations live under the same roof, has been attributed to enhanced socio-economic development, influences from foreign cultures, and Viet Nam's process of modernization/industrialization (AV 2006). In the study area 64.6 percent of respondents indicated that the number of people living in their household was between two and four, followed by 32.8 percent who registered between five and eight household members.

[35] For example, switching from rice or livestock to higher-value products, such as decorative plants, flowers or fruit production. An increasingly common practice in peri-urban Hanoi (van den Berg et. al. 2003).

Using weighted averages, this means that the typical household size in Soc Son (4.17 people) is larger than the national average. Therein, household size in the study area exhibits similar patterns to those found globally, where rural households are often larger than their urban counterparts (Lanjouw and Ravillion 1994). More children represent additional labour for agricultural activities as well as stronger support structures for the elderly (Nguyen 2011).

In the district sample, households primarily engaged in agriculture were, on average, substantially larger than households from the same communities employed in services, manufacturing or the public sector.[36] Similarly, airport employees lived in smaller households, indicating that the drive toward having fewer children is more pronounced in modern sectors of the Vietnamese economy.[37] The consequences of these changing dynamics are likely to be felt most by the female population, who, as a result, may attain higher levels of education, improve their skills/knowledge and experience improvements in gender equality (UNICEF 2003; AV 2006). The gradual transition away from agriculture to other sectors of the economy (especially among young people) as explored in chapter 6, is likely to add further downward pressure on household size in coming generations as the opportunity cost of having children increases.

The second component of the quantitative analysis investigates the time available to participate in income-earning activities. In Viet Nam 85 percent of males and 83 percent of females between the age of fifteen and sixty work on a regular basis (VDR 2004). In the sample population, 93.8 percent of respondents were employed, self-employed or dependent (i.e. work directly for their family). The growing economy of Soc Son and neighbouring districts is providing new jobs and entrepreneurial opportunities in the area, which when combined with a rapidly expanding urban job market, is resulting in minimal unemployment. Across all employment sectors the majority of respondents from Soc Son worked more than 46 hours per week (64.9 percent) (41.2 percent work over 56 hours per week). High working hours are indicative of the rising cost of living throughout Hanoi and its periphery, making it increasingly difficult for low-income populations to maintain their standards of living.

In order to secure their financial situation one-in-four respondents from the district sample indicated that they hold more than one job, often in several part-time positions, each offering less than 25 hours of work per week. To complement the lower availability of stable working hours at a single place of employment, roughly one-third of people primarily engaged in agriculture also worked a second or even third job. The majority of these additional jobs were found to be within the agricultural sector; however, there is some evidence of farmers seeking additional income in the services and manufacturing

[36] In the agricultural sector, 41 percent of respondents lived in households with 5 or more members. In contrast, only 24 percent of those not working in agriculture lived in households with 5 or more members.

[37] Around 75 percent of airport employees lived in households with fewer than 4 members.

sectors. Examples of part-time jobs outside of agriculture included: motorcycle taxi drivers, maintenance and construction workers, salespeople in local shops, and private security guards. Many of these jobs can be directly or indirectly linked to the changing economic structures in Soc Son District, partially instigated by the operation of Noi Bai Airport. The process of finding additional employment outside of the agricultural sector can stabilize incomes during low crop yields and between harvesting periods. By diversifying their sources of income across different sectors of employment, people can reduce exposure to employment shocks, natural disasters and risks associated with the increasing scarcity of land in Soc Son district.

The Soc Son sample indicates that workers in agriculture rely more heavily on part-time labor as compared to people working in other sectors of the local economy, but in total have to work more hours each week to earn a living. In comparison, less than five percent of airport employees living in Soc Son have a second job and most work fewer hours. Therein, the aviation sector follows a trend which can be observed in many industrializing countries, where modernization goes hand in hand with increasing productivity and shorter working hours (Lee et al 2007). This trend is yet to emerge within the local services or manufacturing sectors where working hours remain high, however, few people in these sectors need to work additional jobs. Some estimates attribute the structural transition towards a serviced-based economy and to a lesser degree manufacturing as contributing roughly two-thirds of total GDP growth in the Viet Nam over the past decade. While this transition has been slowing down in recent years, rising productivity and higher value-added are becoming increasingly important drivers of Viet Nam's GDP (Breu et al. 2012). People who worked longer hours and relied on multiple jobs for income were often found to have attained lower levels of formal education, highlighting the contribution of education to the capacity of people to participate in a local economy gradually transitioning away from agriculture.

Education represents the central qualitative measurement of human capital (Keeley 2007; Dae-Bong 2009). The Vietnamese education system has achieved a net enrolment rate in primary education of 97 percent in 2009, and anticipates full primary enrolment by 2015 (WHO 2009a). These figures are reflected in the local community survey, which indicated that 301 out of 305 (98.7 percent) respondents enrolled in primary school. The recent advances in primary enrolment have shifted the focus onwards to improving secondary education, which recorded national enrolment rates of 83.1 percent in lower secondary school and 68.1 percent in upper secondary school in 2008 (ibid.). In Soc Son District, 94.8 percent of respondents enrolled in lower secondary school, with noticeably fewer (68,9 percent) completing secondary education. A significant threshold exists upon graduating from secondary school, after which completion rates of successively higher levels of schooling begin to drop significantly. While 39.5 percent of interviewees enrolled in high school, only 24.3 percent of the sample graduated; of these graduates less than

half continued to pursue further education. Consequently, only 11.5 percent of respondents attained a tertiary degree from college, technical school or university.[38]

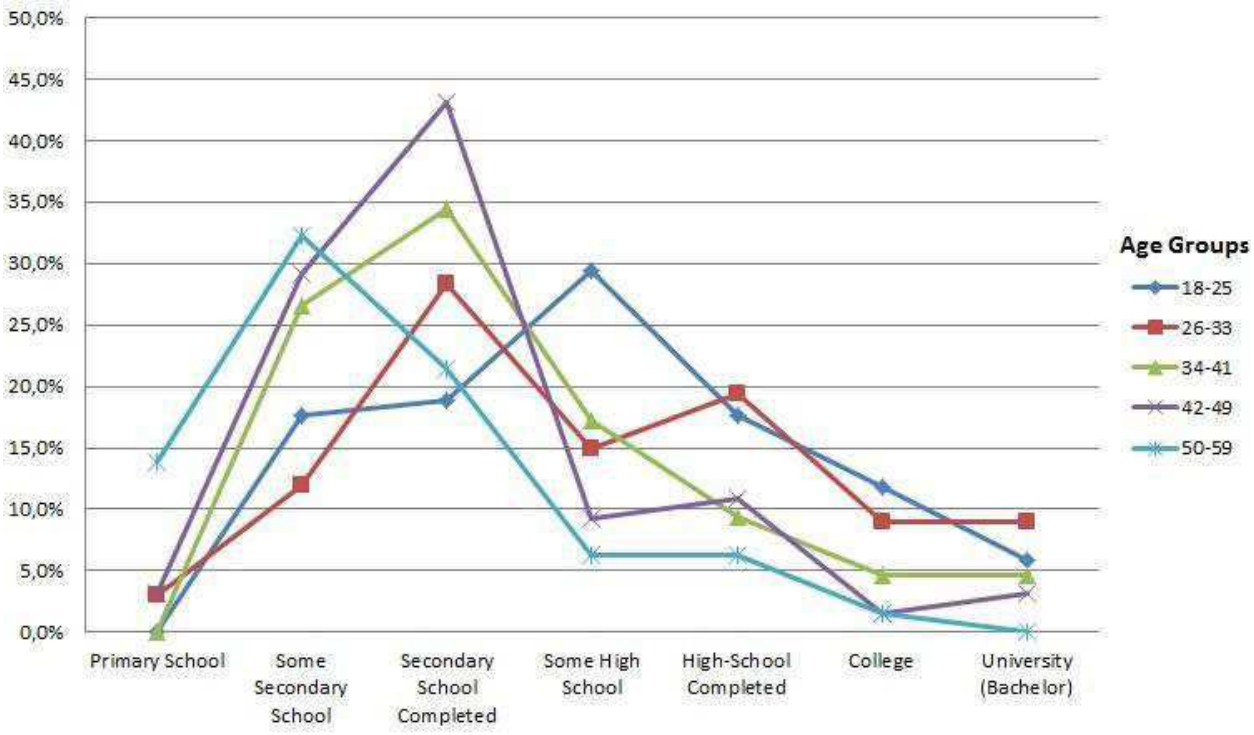


Figure 31. Highest Level of Education Attained by Generation.

Investments in education have risen throughout the country since 2001, and currently account for around 20 percent of government expenditure (MPI 2010). The recent improvements in the Vietnamese education system, in addition to complimentary social dynamics, are exhibited in the data collected. The survey found that younger generations attain, on average, significantly higher levels of education as compared to their predecessors. For example, 42 percent individuals from the sample between the age of 26 and 33 years completed high school, as compared to only 15 percent of those between the age of 42 and 59 years (see figure 31). As a result, it can be concluded that with each coming generation, public investments in education are improving the accessibility and availability of education in Soc Son. Human capital derived from formal education affords people more adaptability to a modernizing economy, where higher education is often a prerequisite for jobs outside of the traditional agricultural sector. The increasing levels of education enable the local workforce to, not only, support the economic modernization of Soc Son District, but perhaps more importantly, allows them to benefit from the changes taking place in their district, many of them instigated by the presence of Noi Bai

[38] Of those who completed tertiary education, 4.3 attended university, 5.2 percent completed college, and 2 percent graduated from technical school.

Airport.[39] While education in general has been improving throughout Viet Nam, the research uncovered gender inequality in the educational attainment of Soc Son residents.

Viet Nam boasts virtually equal enrollment rates for boys and girls in primary and secondary education; however, a recent study by the WHO found that girls represent 70 percent of all school dropouts as they are frequently expected to participate in household activities beyond a certain age (WHO 2009a, VDR 2004). A similar trend can be observed in the research area, with the sample data illustrating a pronounced gender disparity at the high school level: 23.2 percent of male students ended their education prematurely, compared to 50.7 percent of female students who left high school without a degree. Consequently, males are approximately twice as likely to complete high school, college and university as compared to their female counterparts (Figure 32). The data suggests that the lower educational achievements of females in the study area are closely related to their primary role in agriculture. Many women play a central role in harvesting crops and household activities from a young age, and experience pressure to leave school earlier as a result.[40] These differences in access to human capital between genders at an early age can be linked to income inequalities between genders later on in life, which will be discussed further in the section on financial capital. In addition to gender inequality, there exist significant differences in the levels of education attained by residents in each of the five sub-districts included in the sample.

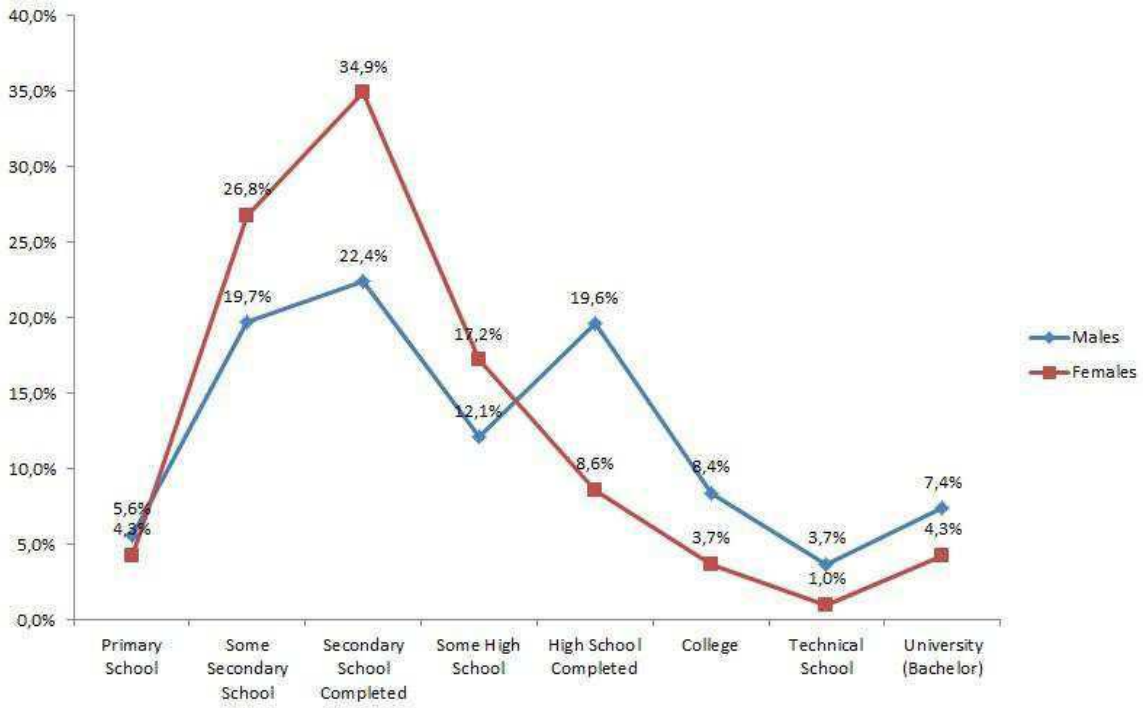


Figure 32. Highest Level of Education Attained by Gender.

[39] This is to say that while residents from the local communities are at this stage not likely to find a place of work at the airport directly, their progressively better education allows them to participate in the catalytic economic effects generated by Noi Bai Airport as presented in chapter 6.

[40] 73.2 percent of women from the local community sample were employed in agriculture, the vast majority of whom consider themselves either self-employed (46.5 percent) or dependent (31.9 percent).

The educational disparity between communities is exemplified by the drop-off threshold which exists upon entry to high school. In Phu Cuong, only 4 out of 59 respondents attained a high school degree or some form of tertiary education. Coincidentally, this subdistrict also exhibited the largest portion of the local population working in agriculture. In contrast, 27 out of 60 respondents from the more services-oriented economy of Mai Dinh attained a high school diploma or higher level of education. This indicates that well-educated individuals are able to seek employment in the more modern sectors of the local economy. Communities with higher average levels of education among residents (Mai Dinh, Thanh Xuan, and Quang Tien) exhibited larger services and manufacturing employment. Inversely, Phu Cuong, the subdistrict with the lowest average level of education, displays the highest degree of agricultural employment. To support the relationship between level of education and type of employment, it was found that only 5.5 percent of employees at Noi Bai Airport did not complete high school, while the majority (64.8 percent) had attained a bachelors or masters degree. Inversely, 75.6 percent of respondents from the local community sample who did not complete secondary education were found to be employed in agriculture.

In addition to formal education, foreign language skills represent a vital asset to the capacity of local residents to participate in economic activities related to the airport, its supply-chains, and generally in the increasingly outward-oriented economy of Viet Nam. English-language students interviewed at a private language school for adults in Hanoi repeatedly emphasized the importance of speaking foreign languages when trying to find employment. According to the airport sample, 76.3 percent of Noi Bai employees indicated they spoke English, with some of them also proficient in Chinese (3.3 percent) and French (1.8 percent). In contrast, respondents from the local community sample exhibited much lower levels of language proficiency with less than five percent able to communicate in a language other than Vietnamese. Notably, of the 4.6 percent of local community sample that spoke English, 78.6 percent were under the age of 33 years. This reinforces the notion that younger generations are progressively more adaptable to processes associated with globalization occurring throughout Viet Nam. The greater language proficiency of younger generations can be attributed, in part, to the introduction of a new national curriculum with English included as a compulsory subject for secondary school pupils and an elective in primary school in 2002 (Hoang 2010). Furthermore, it is also increasingly common to find private foreign-language schools around Hanoi, which are viewed as offering adult students a distinct advantage in local job markets.

Another opportunity for local populations to build on their human capital after the completion of formal education is through on-the-job training opportunities and human development programs (FAO et al. 2009). For this purpose the Vietnamese government introduced the Agriculture and Industry Extension Programmes, which established various training opportunities such as handicrafting, animal raising and improved crop

cultivation techniques (ibid.). Within agriculture, services and manufacturing, only 8 out of 239 respondents referred to their training opportunities offered in a positive manner. In contrast, the majority of respondents from local communities rated these as 'either poor' (133) or 'very poor' (41). As in other countries, it can therefore be assumed that in Viet Nam scholastic/educational achievements play a primary role in determining a person's labor market competitiveness and their capacity to find work outside of manual or low-skilled labour. With few training opportunities for people working in agriculture, their chances to participate full-time in other sectors of the economy (that potentially provide higher incomes and lower working hours) will remain low.

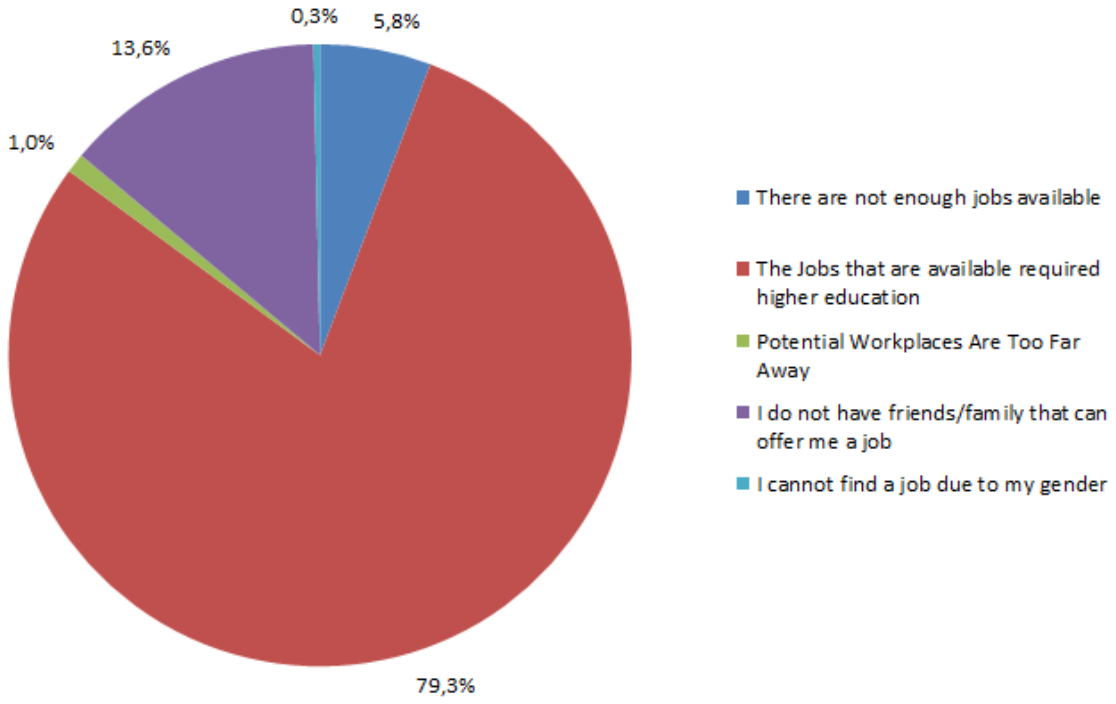


Figure 33. Obstacles to Finding Employment by Local Community Inhabitants.

The importance of education to local livelihoods is further illustrated by respondents' perception of the main obstacles to finding employment in and around Hanoi. In this context, an overwhelming 79.3 percent of the local community sample indicated that the jobs available required a higher education than their own and were unattainable as a result (see figure 33). With less than six percent of respondents stating that there was an insufficient number of jobs available, structural issues related to the mismatch between educational requirements of employers and the educational qualifications of job seekers represent the central barrier to local resident finding employment they desire. Structural un(der)employment[41] is harmful to the local economy and can be considered more permanent and entrenched when compared to other types of unemployment as it can take many generations to address the underlying problems associated with poor education

[41] Underemployment in this case refers to low-productivity and low-income employment to which people are confined as a result of their low level of education.

systems (Schmitt and Warner 2011; Contreras 2011). In recent years, numerous studies have criticized the Vietnamese education system for the quality of classroom resources, scarcity of qualified teachers, censorship, lack of infrastructure, general underinvestment, and a narrow focus on traditional/outdated teaching methods that discourage interactive class participation (Economist 2010; Harman et al. 2010; Evans and Rorris 2010; Nghi 2010; Pham and Jones 2011).

A positive relationship between education and monthly take-home income emerged in the district sample, whereby respondents with higher levels of education were found earn higher levels of income (figure 34). This relationship may best be summarized by two extremes: on the one hand, 74 percent of people who earned more than 4 million VND each month (above-average income) had at least enrolled in high school. On the other hand, 86 percent of respondents who earned less than 1 million VND a month (below the national poverty line) did not advance past secondary school. Education represents a fundamental asset for economic well-being in Soc Son District and will become increasingly relevant as Hanoi transitions toward a more modern, service oriented and technology-driven economy. While the sample data has shown progress among younger generations who are attaining higher levels of education, are finding employment outside of agriculture, and as a result are earning higher wages, a large majority of all age-groups in the local population remain financially vulnerable.

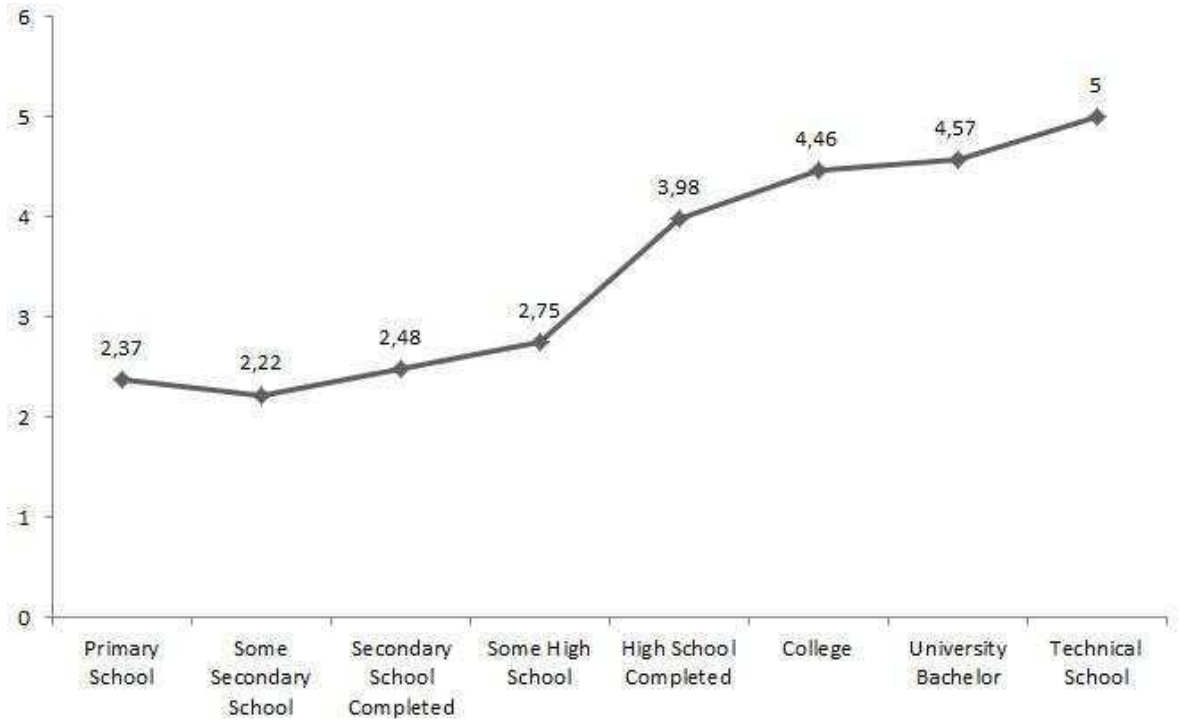


Figure 34. Educational Achievement and Income (VND millions per month).

Concluding Remarks - Human Capital

The presence of Noi Bai Airport in Soc Son District is accelerating processes of change and modernization in the local economy (as discussed in chapter 6), reinforcing

differences between more and less traditional livelihood strategies. People and households benefiting most from the economic diversification occurring in the district have often obtained higher levels of education, typically allowing them to find employment outside the agricultural sector, which is often accompanied by higher wages and working shorter hours. In contrast, individuals who left school before completing secondary school earned significantly less income, worked longer hours, and represented some of the most vulnerable populations in Soc Son District. A majority of respondents directly attributed difficulties in finding higher-paying or more desirable employment to a lack of education, further supporting the positive relationship between education and income in Soc Son District. Within the context of economic modernization, women working in rural households constitute one of the most vulnerable demographic categories, as their anticipated role in the income-generating activities of households encourages early departure from formal education. Consequently, women are much less likely than men to be employed in the services or manufacturing sectors, which are currently providing higher levels of income and creating more new jobs than the agricultural sector.

A combination of the decreasing availability of land for agricultural purposes, a growing population, and risings costs of living indicate that many people working in agriculture will be unable to sustain current standards of living without substantial increases in the productive output of farms in Soc Son. The large increases in agricultural productivity required are unlikely to occur due to constraints imposed by the physical, financial, and natural capital available to local households, each of which will be explored further in following sections. However, if agricultural productivity does not increase substantially, many people in Soc Son will be forced to look for work in employment sectors that often require above-average levels of education. In this context, investments in education are gradually fostering adaptability to changing economic circumstances. Nevertheless, structural issues persist with Noi Bai Airport attracting not only skilled workers from other provinces in Viet Nam, but also accelerating the modernization of the district's economy that improvements in education (at their current pace) may not be able to address.

7.2. Financial Capital

Financial capital refers to the cash, credit/debt, savings, remittances, and physical assets which are essential for the pursuit of a livelihoods strategy (Rakodi and Lloyd-Jones 2002, Scoones 1998). Viet Nam has made substantial progress in alleviating poverty over the past 20 years. Between 1993 and 2008 an average of 1.8 million people were lifted out of poverty each year, reducing the poverty rate from 58.1 percent to 14.5 percent of the total population. Much of this can be attributed to the rapidly growing economy, which enabled the Vietnamese government and employers to create more than 8.1 million new workplaces between 2006 and 2010 (Nguyen 2010). However, pockets of poverty remain embedded throughout the periphery of Viet Nam, with more than 95 percent of

impoverished households found in rural areas (Thang et al. 2006). The incidence of poverty is greatest in the isolated northern parts of the country and along the central highlands, whereas the coastal regions and large urban centers of Ho Chi Minh City, Da Nang, and Hanoi exhibit comparably lower levels of poverty (Minot et al. 2003).[42]

In Soc Son District, less than two percent of all respondents indicated they were unemployed; however, 9.8 percent of survey participants stated that they earned less than one million VND a month (the equivalent of less than 1.50 USD a day). This illustrates that despite advances in poverty alleviation and strong economic growth, a considerable part of the population in the research area still lives at, or just above levels of subsistence. The following section will present the financial assets available to residents of Soc Son by measuring personal incomes and household savings in relation to the primary employment sector, area of residence, gender, and age of respondents; with the objective of identifying populations within the sample who exhibit varying degrees of financial vulnerability to changes in the local economy, and those who are already experiencing forms of economic marginalization.

Distinct differences between the personal incomes of workers employed in agriculture and those working in services/manufacturing sectors exhibit elements of a dualistic economy. On the one side there is the more traditional agricultural sector, with lower levels of income and longer working hours; existing opposite to it are the more modern services/manufacturing sectors that typically provide higher wages and relatively shorter working hours (figure …). The dichotomy is exemplified by data showing that all respondents earning less than one million VND each month (1.50 USD a day) are employed in agriculture, while 76.5 percent of those earning more than four million VND a month are employed outside of agriculture. Furthermore, agriculture in Soc Son is experiencing limits to productivity imposed by increasing land scarcity and degradation of natural capital, while the services and manufacturing sectors are relatively new to the area and exhibit strong growth potential. These different trajectories may continue to reinforce the divide between the traditional and the modern in Soc Son.

When looking at each employment sector separately, significant variations in income can be witnessed between the five sub-districts included in the sample. In the southernmost sub-district of Phu Minh farmers earned on average 1.18 million VND/month, while their northern neighbors in Quang Tien, also working in agriculture, had an average income of 2.83 million VND/month (figure 35). These differences can be attributed to a multitude of factors, including: types of crop, access to markets, soil quality and many others; however, there exists a clear distinction between wealthy farmers and farmers operating close to subsistence levels, which can often be linked to land ownership

[42] As a rule of thumb, the depth of poverty in Viet Nam increases with elevation. Among minority groups living in the central highlands, who account for one-fifth of the total population, 50 percent are still considered poor and 31 percent experience food poverty (Fan et al. 2004; Epprecht et al. 2011)

(discussed further in physical capital section). A similar pattern can be observed in the services sector, where Thanh Xuan in the north west has the lowest monthly income (2.4 million VND/month), whereas in the remaining sub-districts average monthly incomes were around 4 million VND (figure 36). In contrast to agriculture, no one working in services was living below the poverty line and the range of incomes in services were noticeably smaller. However, individual incomes represent just one aspect of a person's financial capital as in many cases monetary resources are shared between family/household members in order to pursue shared livelihood strategies.

Figure 35. Average Monthly Income in Agriculture by Subdistrict in VND millions.

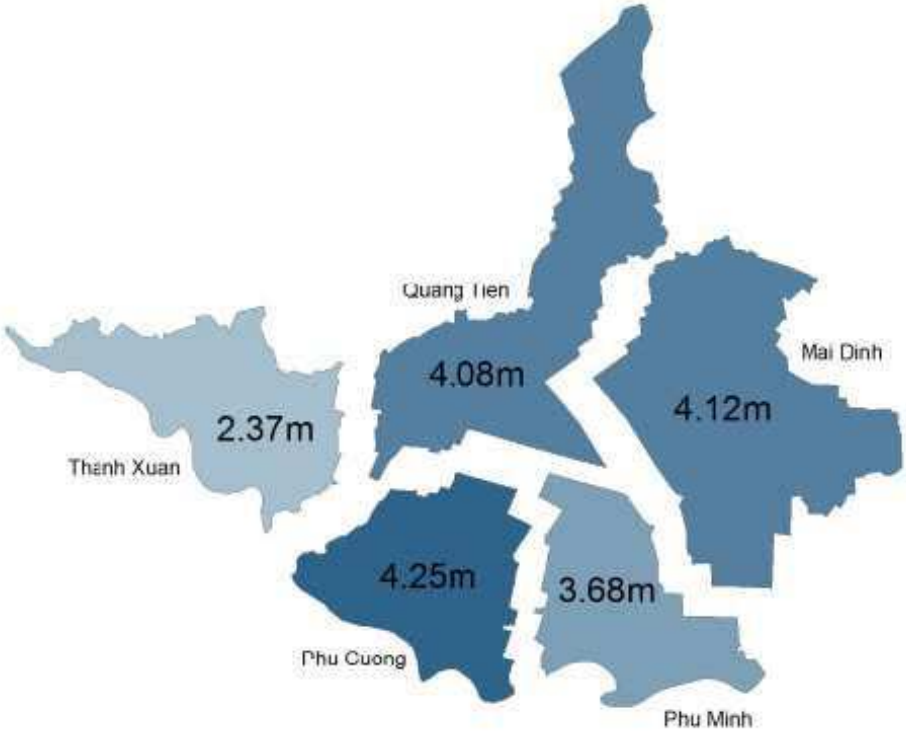


Figure 36. Average Monthly Income in Services and Manufacturing by Subdistrict in VND millions.

The ability of households to save money, either to be used in times of financial hardship or for future investments (e.g. in human or physical capital), represents a fundamental element of livelihood strategies. Within the local community sample, 66.7 percent of respondents indicated their household had less than one million VND left at the end of the month to save or invest after paying all bills and taxes. In agriculture, only 32.9 percent of households are able to save more than one million VND each month, a lower rate compared to households engaged in services (40.3 percent), manufacturing (47.1 percent), or the public sector (54.6 percent). This demonstrates that people engaged in agriculture will find it especially difficult to transition to more modern modes of production as farming households are unable to accumulate the necessary capital for needed investments without external help; a transition necessary to maintain current standards of living in the face of the continuously rising costs of living commonly experienced by respondents from the local communities (McPherson 2012).

Economic shocks, natural disasters, and personal tragedies have the potential to make people vulnerable to poverty recurrence (Nguyen 2010). The vulnerability of local households is illustrated by the findings that more than three-quarters of the local community sample indicated that in case of losing their jobs, their savings would last less than one month. Households with a low or irregular income are unlikely to generate the financial resources necessary to build up savings or reduce their exposure to future risks. Over sixty percent of households who had less than one million VND left at the end of each month after paying all bills and taxes indicated that in the case of a severe employment or income shocks, total household savings would last less than one month. As agriculture represents the economic sector with the lowest income and highest dependence on natural capital (i.e. the capital most prone to degradation), it is people engaged in this sector that are subject to the highest levels of financial vulnerability and face the greatest risk of marginalization. Demographics working in services or manufacturing face similar risks related to poverty recurrence, as in many cases their employment situation is much more closely linked to fluctuations in the Vietnamese economy and global supply-chains. Nonetheless, based on the changing economic circumstances, their skills and specializations are in higher demand as compared to agricultural workers, making it easier for them to transition from one job to another. Thus they display higher levels of flexibility with regard to employment shocks, which, in the long run, is expected to decrease their economic vulnerability.

The unstable financial foundation upon which many Soc Son citizens build their livelihood is exacerbated by data that suggests close to half of the district sample consider their job security either ‘poor’ or ‘very poor’. When looking across employment sectors, perceptions of job security are lowest in agriculture with 61 percent indicating ‘poor’ or ‘very poor’, followed by manufacturing (52 percent), services (34 percent) and the public sector (19 percent). Low household savings rates combined with a common fear of

becoming unemployed create an environment that discourages investment. If farmers are unable or unwilling to invest in productive inputs that improve or increase crop yields, their livelihoods situation will gradually deteriorate in the face of increasing living costs. In the long run this will have a negative effect on the level of productivity, further eroding the livelihoods basis of farming households faced natural resource constraints and increasing costs. As a result the savings rates of these households decrease further, creating a vicious cycle that reinforces the vulnerabilities and marginalization present in some parts of the agricultural sector. At the opposite end of the spectrum, people employed in wage-labour are neither dependent on natural capital (as a finite resource) nor personal investments in production technology, allowing them more adaptability to changes in the local economy. During periods of economic depression, however, wage laborers can fall victim to cyclical unemployment and other fluctuations on the labor market. As a result, and for a multitude of reasons, people in all sectors of the local economy have turned to microloans to overcome financial constraints[43].

The high demand for microloans in Soc Son District is served by various rural development organizations such as the Soc Son Women's Fund; the TYM Fund, the Social Policy Bank, VietEd Center and SEDA Center (Tuyet 2o12). Soc Son Women's Fund currently provides 5,000 people with loans of about eight billion VND; the TYM Fund supports more than 6,000 families with loans of 15 billion VND; and SEDA Center operates in neighbouring Dong Anh District supporting 4,000 households with loans of around eight billion VND. Combined the economic contribution of these institutions to more than 15,000 households translates to over 31 billion VND (1,5 million USD) (ibid.). Recipients of microfinance services often invest their loans in income generating activities such as livestock, small businesses, or product trade. Other common investments include the planting of crops, increasing fixed assets, education for their children, and family health care (ibid.). Together, these funds represent a powerful mechanism through which the financial vulnerability of households in Soc Son can be addressed and ultimately reduced.

Women engaged in agriculture represent a demographic that is often specifically targeted by microfinance and rural development organizations as they exhibit particularly high levels of vulnerability. Based on the district data, gender income inequality is prevalent, with women across the sample earning roughly 35 percent less than men (see figure 37). This finding supports a recent study from the UNDP (2006), which found that women in Viet Nam attain on average 39 percent lower wages than men.[44] Income disparities between genders are more pronounced outside of the services and manufacturing sectors, with men earning substantially more than women in the agricultural and public sectors. Following a similar trend of higher levels of income equality in the more modern sectors

[43] One in four respondents in the sample had at some point participated in a microcredit scheme.

[44] Women in Viet Nam receive comparatively higher wages than female workers in Japan (56 percent lower) or Malaysia (64 percent lower) with regard to gender equality.

of the local economy, employees at Noi Bai Airport exhibited no significant income-related differences between men and women in all income categories with one exception.[45]

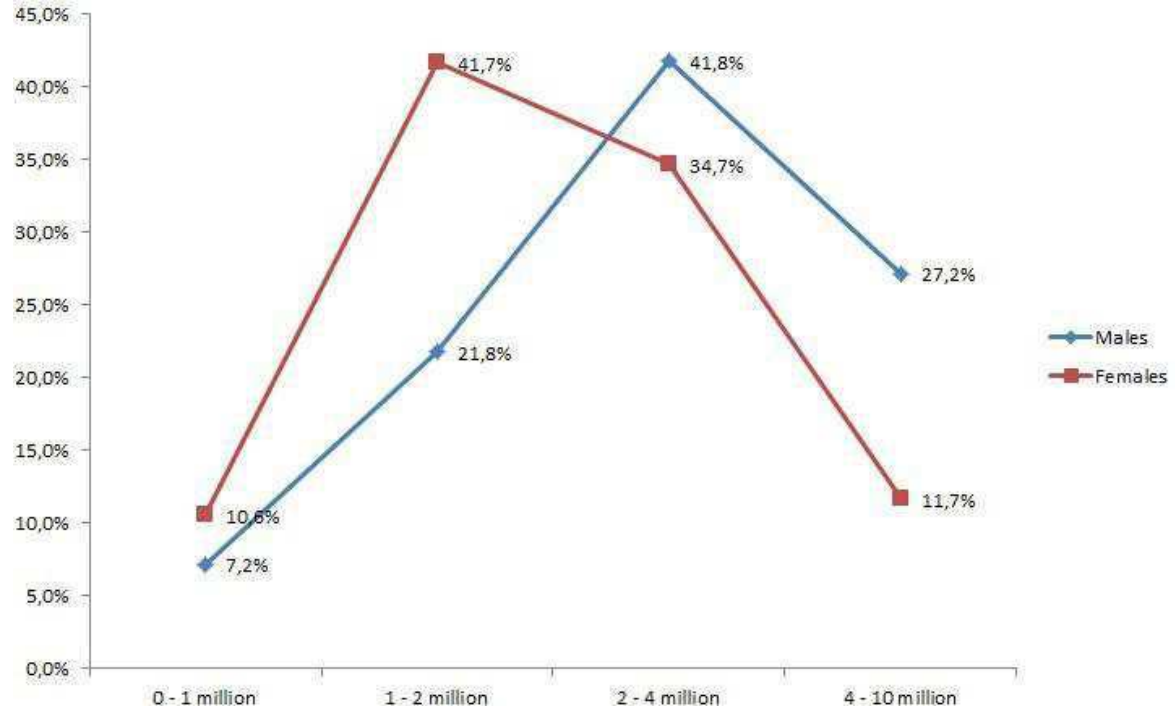


Figure 37. Income Categories by Gender in Local Communities in VND million per month.

When examining income across genders and age groups in Soc Son District, similar patterns of inequality to those found previously in the section on human capital emerge. Younger males are obtaining higher levels of education than older generations, providing a human capital base from which to access new employment opportunities in the growing services and manufacturing sectors. This has resulted in men under the age of 33 earning, on average, more than men above the same age in the sample (figure 38) . In contrast, persistently high drop-out rates in primary and secondary school among females, often as a result of their expected role in agricultural and household activities, have led to minimal differences between age-groups: younger women in the district are earning about the same as older women in the district (figure 39). When combined with the findings that men are earning significantly more than women in the sample, it indicates that as the incomes of local men continue to improve while the wages of women stagnate, income inequality between men and women will continue to grow. It may therefore be concluded that men are exhibiting increasing adaptability to changing economic structures in Soc Son, while the capacity of women to take advantage of newly-created employment opportunities outside of agriculture has remained somewhat the same.

[45] In the top-tier category of income over 10 million VND a month a clear gender disparity emerged with 14 males as compared to 4 females earning these wages at the airport.

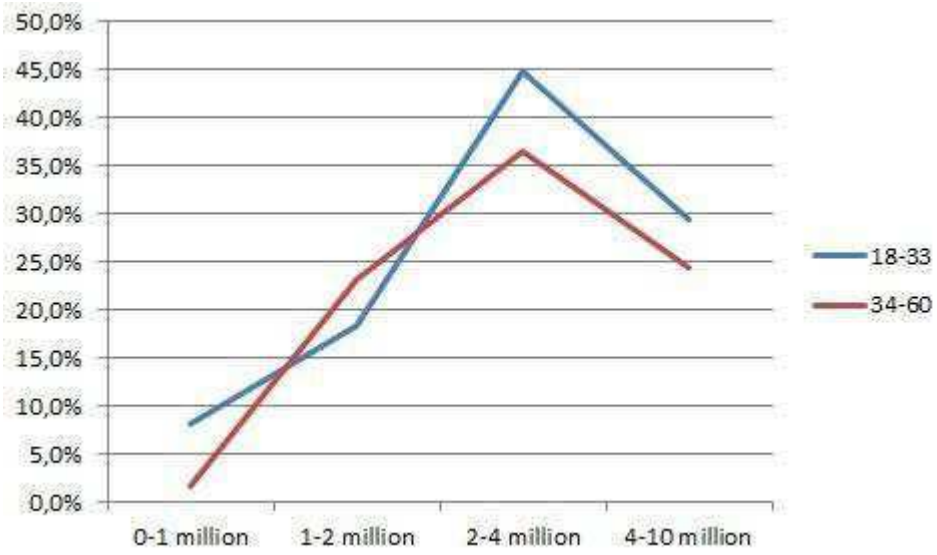


Figure 38. Average Monthly Income of Men by Age Categories: 18-33 and 34-60.

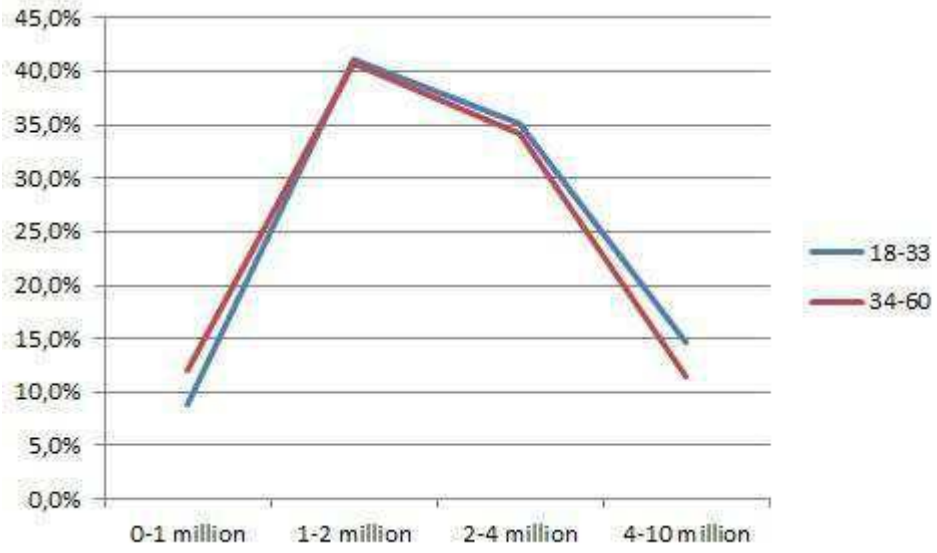


Figure 39. Average Monthly Income of Women by Age Categories: 18-33 and 34-60.

Concluding Remarks - Financial Capital

Financial capital has been described as the most versatile and least-available to the poor: it can be converted directly into other types of capital (e.g. education, shelter, or machinery) and utilized to achieve direct livelihood outcomes (e.g. in the form of food) that fulfill basic needs and reduce vulnerability (Kollmair and Gamper 2002). With a district-wide average monthly income of around three million VND, the incidence of poverty in Soc Son is much lower than in other rural/peri-urban areas of Viet Nam. Nonetheless, differences in personal incomes, household savings rates and employment sectors indicate varying degrees of vulnerability between populations in the five sub-districts, that together exhibit elements of a dualistic economy. On the one side there is the more traditional agricultural sector with lower levels of income and longer working hours; on the other side there exists the more modern services sectors that typically provides higher

wages and greater job security. These sectors do not exist independently of one another, with some individuals working primarily in agriculture while finding additional part-time work in services or manufacturing to complement their income. However, when looking at the primary occupation of local residents in relation to income a strong pattern emerges: people who work in the agricultural sector display the lowest personal income, lowest household savings, lowest savings rate, and highest perceived risk of losing their job. The subsistence-level farmers who depend on small plots of land exhibit the highest levels of financial vulnerability among the population of Soc Son. The physical and natural capital that supports these livelihoods will be explored in more detail in the following sections.

7.3. Physical Capital

Physical or produced capital is the basic infrastructure (transport, energy, communications, water, shelter) and the production equipment which enable people to pursue their livelihoods (Rakodi and Lloyd-Jones 2002; Scoones 1998). The effects of physical capital are directly linked to the sustainability of a livelihood and can best be understood through the concept of opportunity cost: without physical capital or well-maintained infrastructure, access to other capitals such as education (human capital) or income (financial capital) may become prohibitively costly (Kollmair and Gamper 2002). Therefore, physical capital does not represent an end in itself, but instead enables the attainment of other capitals essential for the successful achievement of livelihood strategies. The following section will first explore private forms of physical assets, followed by public types of physical capital available to Soc Son residents.

One of the most fundamental aspects of physical capital is to facilitate transportation to and from markets, places of work, schools or any number of other destinations that support the pursuit of desired livelihood outcomes. Throughout Viet Nam, the motorcycle represents the primary mode of transportation, accounting for around 65 percent of all vehicular journeys; this is followed by the bicycle at 25 percent.[46] In this context, airport employees show an increasing propensity to switch from motorcycles to public transportation or cars. This can be attributed to three main factors. First, most airport employees live between 20 and 50 kilometers from the airport, making the automobile (and carpooling) more comfortable than commuting by motorcycle. Second, their comparably higher income allows them to purchase luxury items such as cars, which are too expensive for most local community residents. Third, high levels of traffic congestion around Noi Bai have led the airport authority to encourage more efficient modes of transportation by providing public transportation subsidies for their employees. Nonetheless, when comparing both the district and the airport samples it becomes

[46] Buses, as the main form of public transportation, constitute seven percent of all traffic in Viet Nam. In contrast, automobiles are used for less than five percent of trips in urban areas despite strong growth trends that doubled the number of cars to around 300,000 between 2001 and 2006 (WB 2007).

apparent that the motorcycle remains the primary private asset in Viet Nam regardless of income. Even among the lowest-income bracket[47] in the district sample, 73 percent of respondents had invested in a motorcycle or moped, reiterating the importance of quick and easy transportation within the region and perhaps highlighting the underdevelopment of affordable alternatives in public transport within Soc Son District.

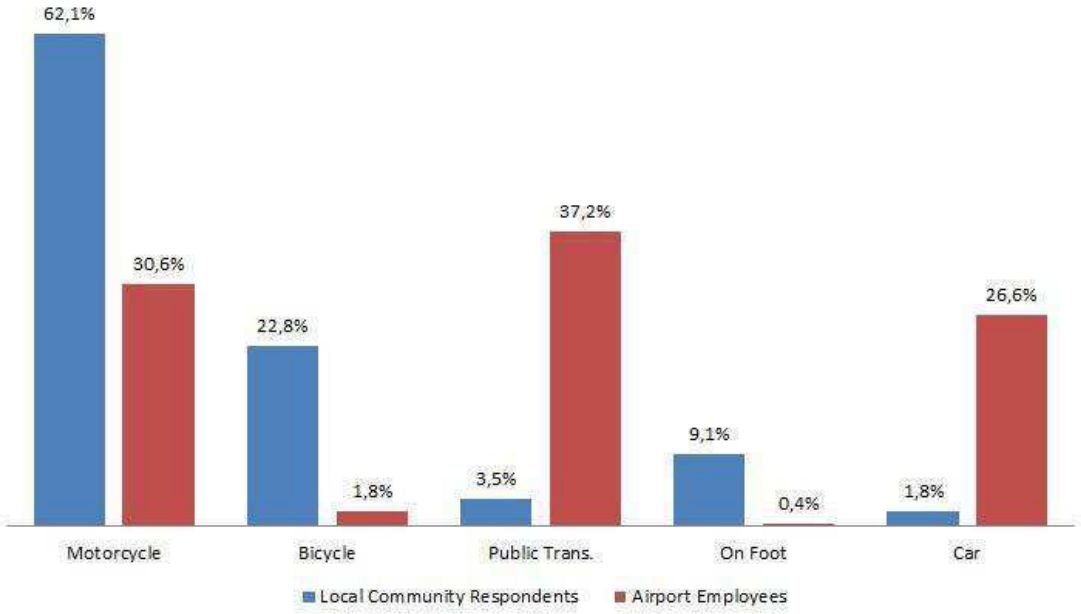


Figure 40. Transportation Method Used to Commute to Work - Local Residents vis-a-vis Airport Employees.

In the study area, 64.5 percent of respondents possess land rights. Given the scarcity of available land in Soc Son and the difficulties associated with the private transfer of land rights under Vietnamese law, these are most commonly obtained through family inheritance. It can therefore be assumed that a majority of people who own land in the district belong to families who have been settled in Soc Son District for long periods of time. In both the local agricultural and services sectors, around 70 percent of people from the sample hold land rights, indicating not only the importance of land for farming households, but also that many of those now working in services or manufacturing have recently transitioned away from agriculture as a primary source of income. In contrast, many airport employees come from different parts of Viet Nam, leaving behind their family estates to find work in other provinces. As real estate prices in Soc Son and the greater Hanoi region have increased tremendously in recent years, airport employees are typically unable or choose not to acquire land/property rights upon arrival despite their relatively higher incomes.

[47] Those who earn less than 1 million VND a month.

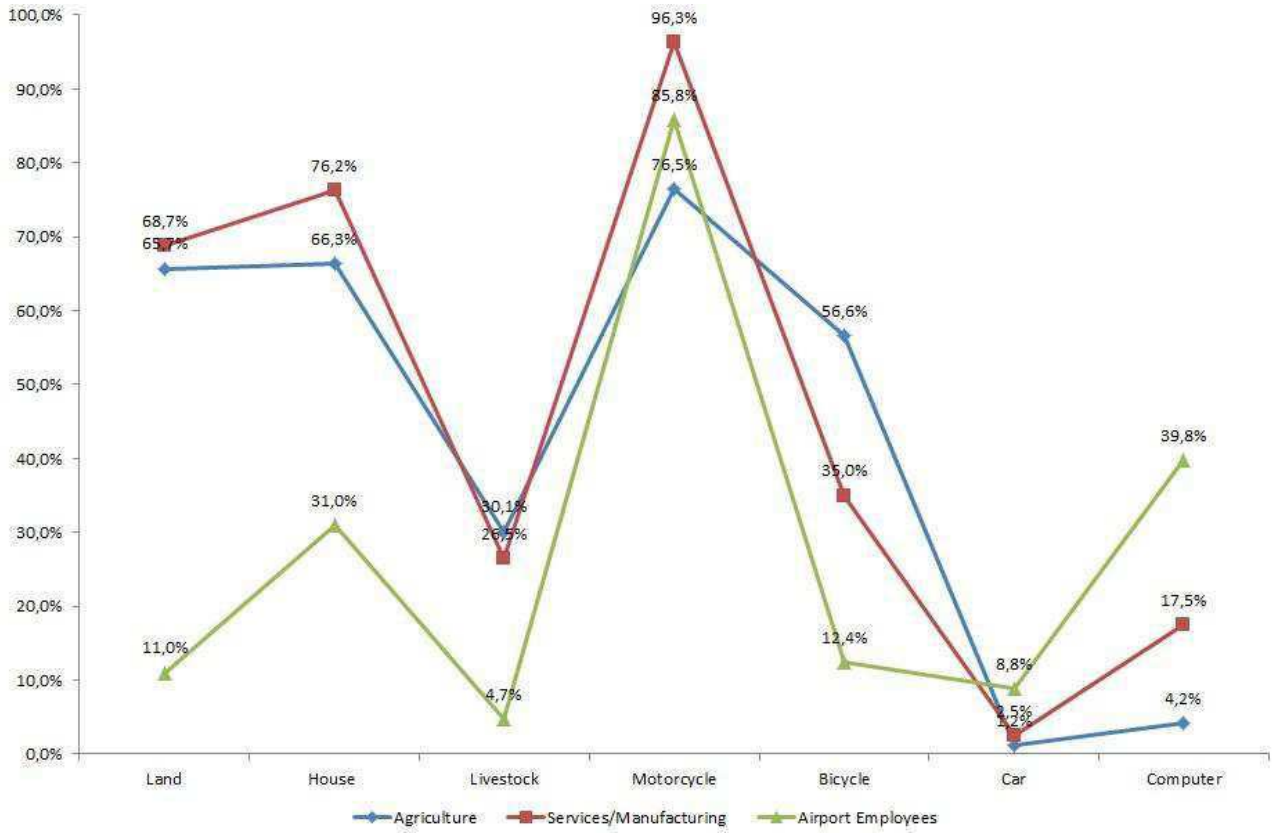


Figure 41. Asset Ownership of Airport Employees, and Local Residents Involved in Agriculture vis-a-vis Services/Manufacturing.

The availability of cultivated land and ownership of land rights is of fundamental importance to most people in the agricultural sector, as it enables them to access the natural capital that provides the basis of their livelihood. People working in agriculture that do not hold land rights were found to rely heavily on part-time wage labour in multiple jobs to earn a living. On the one hand, these livelihood strategies can increase vulnerability during poor harvests or droughts, as landowners (or land rights holders) will not require additional labour on their land, but will instead ensure that they themselves and their families have enough work and food. On the other hand, part-time wage labourers also have increased mobility between places of work, meaning that if one farm is experiencing a poor harvest they can seek work at others. This constitutes an advantage over small-scale farmers who are effectively tied to their land.[48]

Differences in the use of modern technologies, as exemplified by the ownership of personal computers, reinforces the dichotomy between the traditional agricultural sector and the more modern services/manufacturing sectors (figure 41). In this context, use of the internet in Viet Nam has increased tremendously over the past decade (see figure 42). In 2000 less than one percent (200,000) of Vietnamese citizens had access to the world wide web; twelve-years later this number had risen to 30 million internet-users, representing one-in-three Vietnamese (IWS 2012). In modern society the internet

[48] Interestingly, in the agricultural sector land ownership per se did not seem to have an impact on the level of income, with both landowners and wage laborers recording similar average incomes.

represents a fundamental system of communication that touches upon almost every aspect of life, enabling people to communicate, exchange information, and do business. It also plays a key role in education and provides access to a myriad of instructional resources including literature, encyclopedias, and academic databases (UNESCO 2003). Furthermore, the internet enables people around the world to use email or social networking sites, giving them the opportunity to get/keep in touch with friends, family and acquaintances without barriers of distance, time, and cost — all of which help increase and maintain social capital (to be discussed later). Lastly, the world wide web supports the trading of commodities by the clicking of a button and opens marketing opportunities for everyone. Therein traders can reach potential customers (and vice versa) much more efficiently, which can significantly improve income opportunities. In the survey, 40 percent of airport employees owned a personal computer as compared to 13 percent of local community respondents[49], demonstrating how higher incomes, better education and employment in a modern sector facilitates access to communications technology — a process with positive spillover effects for society as a whole (MGI 2011).

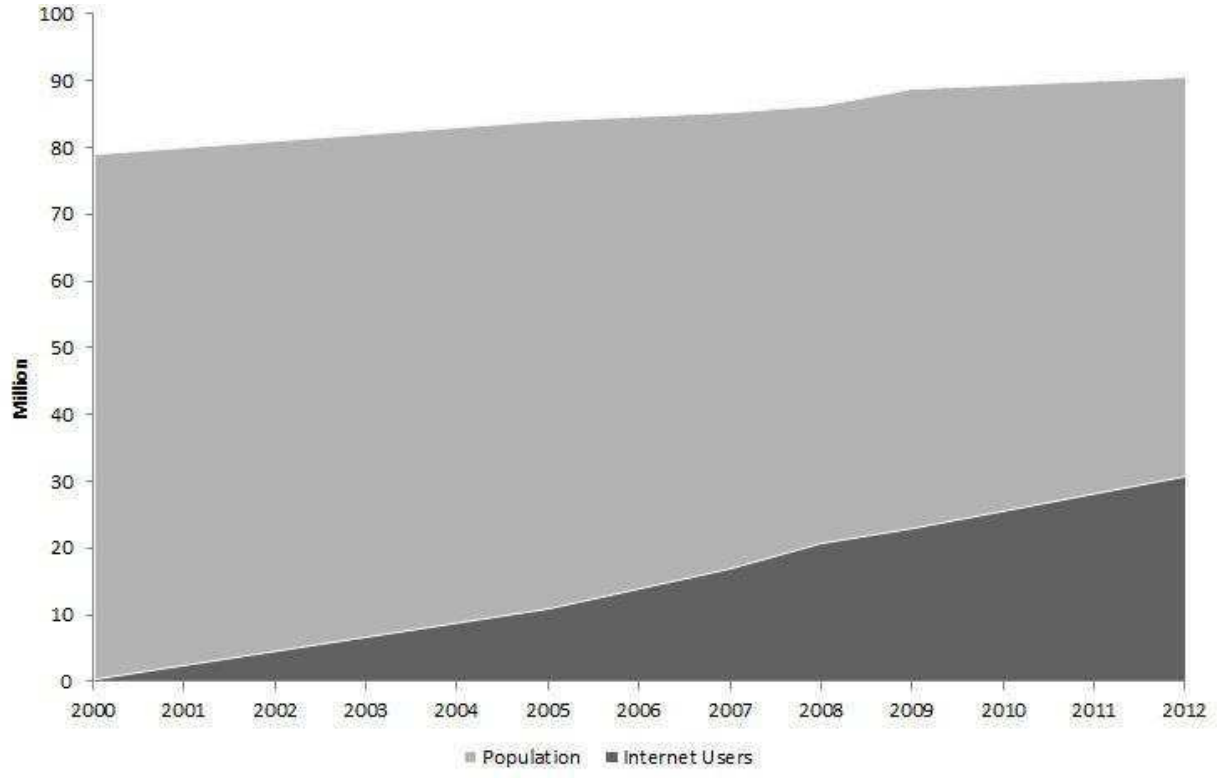


Figure 42. Internet Usage Viet Nam as Share of the Total Population (based on IWS 2012)

A recurring theme encountered throughout the primary data collection was the importance of public physical infrastructure to local livelihoods and the lack thereof. The need for improved roads, healthcare, water and sanitation, and electricity was reiterated continuously throughout interviews and questionnaire responses. Notably, respondents

[49] Among people working in services and manufacturing, roughly 17 percent owned a computer, compared to 4 percent of people in the agricultural sector.
49

from local communities repeatedly emphasized the need for better roads and transportation networks enabling them to move their products more easily and conveniently. Representatives from local government, community organizations and academic institutions all confirmed the importance of infrastructure improvements around Hanoi as critical for continued economic growth and well-being of peri-urban populations (Pham 2012; Tran 2012). Addressing the severe traffic congestion in Soc Son was commonly referred to as the main public infrastructure challenge facing the district. This position is supported by recent statistics suggesting that the outdated and neglected road networks in Viet Nam not only create congestion, leading to both negative economic and environmental consequences, but also higher rates of traffic accidents. In a society characterized by rapid increases in motorization, traffic accidents have become the leading cause of death for those aged between 15-29 years of age.[50] The presence of an international airport, such as Noi Bai, induces investments in modern roads and public transportation which can help to alleviate problems created by outdated public infrastructure (for more information see chapter 6).

Safety and policing represent another important aspect of public physical capital, and exhibited an overall positive perception in the study area.[51] Respondents stated that authorities pay greater attention to the security around Noi Bai Airport, leading to lower crimes rates in Soc Son as compared to other peri-urban districts. Similarly, the reliability of the electrical grid in the study area was rated particularly high, hinting at positive spillovers from the airport into neighboring communities (as it requires a stable electricity supply to operate safely). Other forms of public physical capital measured in the study area include health services, sanitation and water utilities. While these may have a less-direct relationship to the airport, they do not remain unaffected by airport activities. The availability, accessibility and quality of physical infrastructure on the ground is not evenly distributed throughout the study area. Rather, each community has a unique perspective on the quality of local public physical capitals. Collectively, water utilities, road networks, and internet services display the lowest overall ratings, highlighting these as areas that should be prioritized.[52] It is hoped that as a result of economic modernization and long-term district-wide planning, the availability and accessibility of public physical capital will be improved throughout the study area and beyond, enabling people to obtain their livelihoods in a more sustainable manner.

[50] It is estimated that around 15,000 people perish in Viet Nam every year due to traffic-related incidents (WHO 2010).

[51] With the exception of Thanh Xuan, who rated safety and policing between 'average' and 'poor'.

[52] For a summary of the perceptions of residents in each of the five sub-districts regarding water utilities, roads, electricity services, sanitation services, public transportation, policing services, health services and internet services please see the Appendix III.

Concluding Remarks - Physical Capital

Physical capital plays a key role in supporting the preservation and attainment of other capitals in order to achieve successful livelihoods outcomes. The research findings demonstrate that ownership of private physical capital is closely related to the livelihoods strategy employed. More modern livelihood strategies display a tendency to use less fixed assets, allowing them more flexibility to changes in the local economy and increased mobility. In contrast, traditional livelihood strategies rely more heavily on fixed assets, in turn constraining flexibility and mobility but also providing a reliable and often stable source of income. Differences in the ownership of property, vehicles (cars and motorcycles), and computers between local farmers, wage-labourers, and airport employees exemplify the strong dichotomy between traditional agricultural livelihoods and the emerging services, manufacturing and technology sectors of the region. The importance of adequate public physical capital is exemplified by the challenges and constraints that poorly-maintained and underdeveloped infrastructure present Soc Son District (including traffic congestion, water pollution, unreliable electricity, low levels of internet access).

Throughout Viet Nam, many basic services such as public transportation, road networks and water utilities remain outdated and are unable to cope with modern pressures. The airport, as a platform for economic growth and modernization, can instigate spillover effects that improve the availability and quality of public services in the region as a whole. Public transportation, security/policing and road networks provide a prime example for this. Compared to local and regional averages, public transportation and security/policing were found to be above-average; however, road networks remain overburdened. With the planned expansion of the airport, the road system in Soc Son will undergo a complete overhaul improving the connectivity of the district with Hanoi and other provinces throughout the country. In this context not only airport employees and users of the airport will profit, but the local population as well. Other services such as utilities, sanitation, or internet services display less direct links to airport operation and development, yet ongoing economic growth and rising levels of affluence are likely to have a positive impact on these aspects of physical capital, especially if careful planning is applied in the process.

7.4. Natural Capital

Natural capital is a concept used to analyze the resource stocks from which resource flows essential to the pursuit of livelihoods strategies are derived. These comprise land, water, and other environmental resources, but especially common pool resources (Scoones 1998; Rakodi and Lloyd-Jones 2002). Dependency on natural capital usually increases with poverty and makes low-income households particularly vulnerable to climate change and natural disasters (Kollmair and Gamper 2002). Viet Nam is a small country that covers only about one percent of the global land mass. At the same time it

ranks at number ten in the world in terms of biodiversity, and is home to more than ten percent of all animal species (MARD 2003). The Vietnamese government has pledged to preserve this unique environment and is actively promoting policies of sustainable development. In this context the sustainability strategies and environmental guidelines proposed by Agenda 21 have been incorporated into almost every policy area on a national, regional and local level. These comprises a wide variety of laws such as the Environmental Protection Law (1993; amended 2005), the Water Resources Law (1998), the Forest Protection and Development Law (2004), and the Law on Biological Diversity (2008). Nonetheless, Viet Nam's position as biodiversity hotspot is threatened, with the quality of forests declining and coastal mangroves shrinking rapidly, from 250,000 hectares in 1990, to 155,000 hectares in 2010. Urban and development, climate change, and soil erosion have degraded more than half of Viet Nam's land area, presenting a serious threat to agriculture and the country's position as rice bowl of Southeast Asia (MPI 2010).

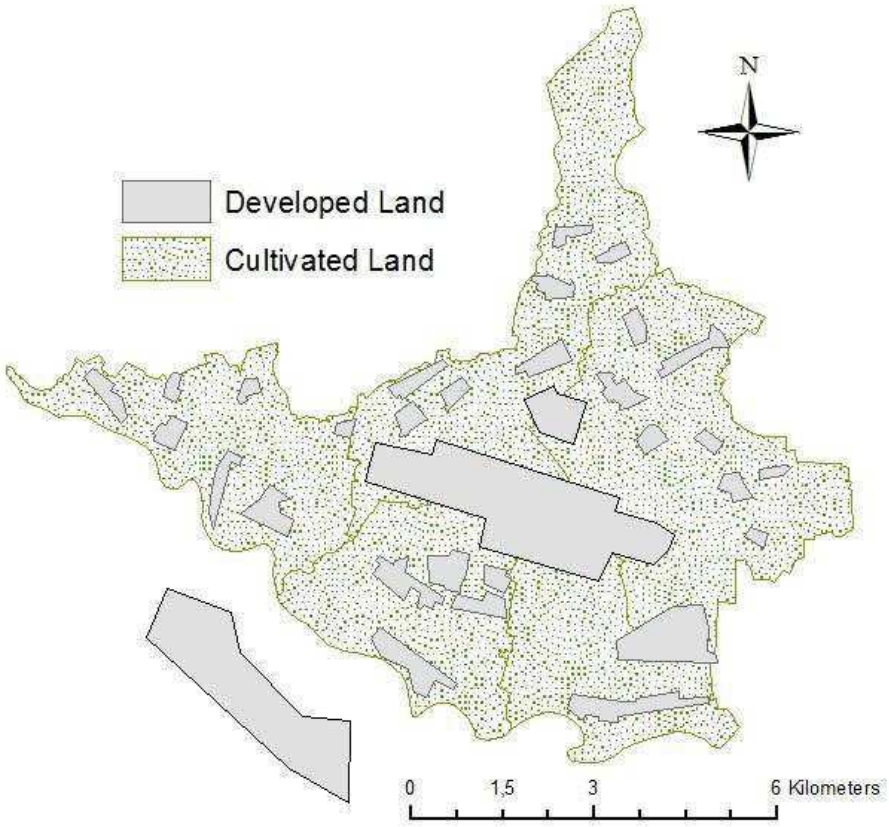
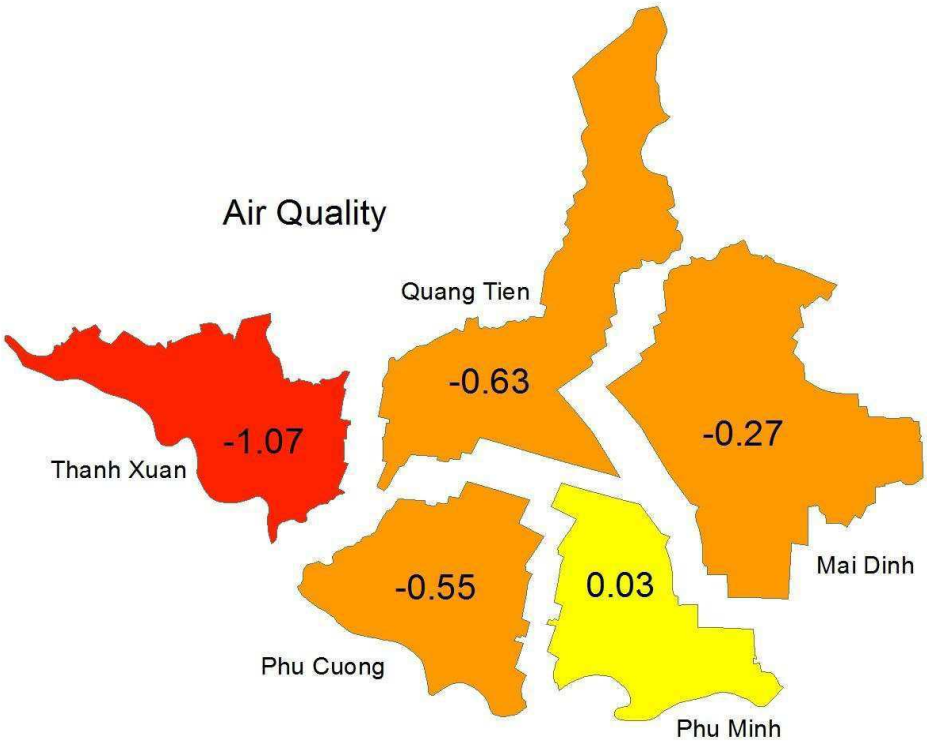


Figure 43. Land Use in the Research Area

In Soc Son District, local livelihoods are not only threatened by climate change and unsustainable land use, but also by water, air and solid waste pollution, all of which negatively affect the health of the local population and their primary means of production. While access to clean drinking water throughout rural areas in Viet Nam has risen to 80 percent, only 60 percent of these households own sanitary toilets (WHO 2009a; UN 2010). Furthermore, less than thirty percent of industrial parks own wastewater treatment facilities, and freshwater reservoirs close to mines and urban areas are often heavily polluted (UN 2010). As economic growth occurs predominantly as a

result of the progressive accumulation of material factors of production (rather than efficiency gains), Viet Nam relies on a relatively unskilled workforce, weak technological capabilities and low investments in research and development (Perkins & Vu 2010). Consequently, economic growth will continue to depend primarily on natural resource extraction from forests, fisheries, agriculture and mining. It will be key for Viet Nam to use these resources in a sustainable and efficient manner in order to not deplete the foundation for future development (UN 2010).

Most land around Noi Bai Airport is being cultivated for agricultural purposes (roughly 70 percent), and interspersed by small to medium-sized villages (see figure 43). With the high dependence on agriculture for household income and food production in peri-urban Hanoi, environmental pollution/degradation poses a significant threat to local livelihoods. In order to assess the extent of pollution in the study area, local community respondents were asked to provide a rating of their perception of the quality of four environmental indicators: air, water, soil and noise (figure 44).[53] While the rating system applied in the survey is subjective and dependant upon the experiences of individual respondents rather than precise scientific measurements, it still allows for the identification of specific areas that are subject to problems of pollution, all of which are discussed in the following paragraphs using comparative secondary data to check their validity.



[53] For a more detailed discussion for noise pollution at Noi Bai Airport see chapter 6, catalytic economic impacts.

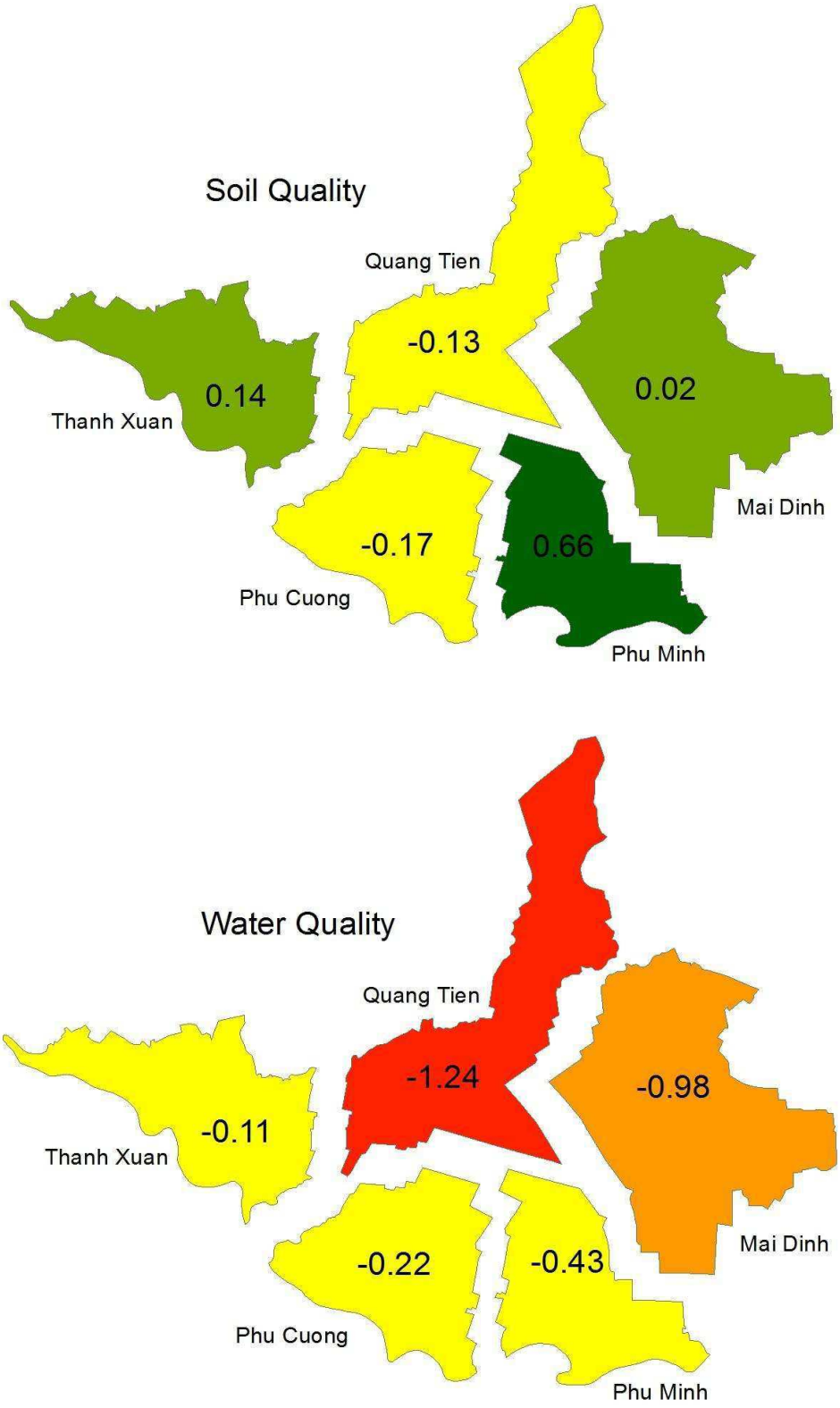


Figure 44. Perception of Environmental Pollution in the Study Area.

Air quality was rated the worst in the northern communes of Thanh Xuan and Quang Tien, while Phu Minh in the South recorded 'average' as the best overall rating in this category. Respondents also voiced their concerns with dust/smoke in the air, and unpleasant smells emanating from the airport runway during cleaning procedures. Therein the survey data supports recent findings by the WHO, who refer to Hanoi as one of the

most polluted cities in Southeast Asia (Nguoi 2012). Traffic represents the main culprit of air pollution, with motorbikes contributing around 95 percent of all vehicle emissions. Especially the content of PM10 (particles less than 10 micrometers in diameter), a substance which can accumulate in the lungs and cause respiratory diseases, has reached levels four times higher than the alarm level proposed by the WHO (Hung 2010b; Nguoi 2012). Due to the role of Noi Bai Airport as economic engine, the traffic volume in/to Soc Son District is particularly high. With close to two million registered motorcycles in Hanoi driving an average of 7300 kilometers per year, and annual traffic growth rates of 12-15 percent, air pollution is likely to remain a health issue for local residents and can only be curbed with improvements in public transportation, more stringent emissions laws, the use of modern catalytic converters, and better vehicle maintenance (WB 2008).

Water quality received the most negative rating throughout the five communities, with particularly negative ratings in Quang Tien (poor to very poor) and Mai Dinh (poor). These findings are congruent with recent estimates by the Northern Water Resource Planning and Survey Federation in Hanoi, who confirmed that every day 400,000 to 450,000 m^3 of domestic wastewater and 270,000 m^3 of industrial wastewater are discharged into the local drainage system, only ten percent of which are being treated (Thi 2009). As a result the quality of groundwater, rivers and lakes has deteriorated dramatically in recent years, reaching dangerous levels of E.coli bacteria, coliform, nitrogen, ammonium, arsenic and other heavy metals that, in some cases, are found in levels 40 times higher than permitted (VC 2008; Luu et al. 2008). This is particularly detrimental for the livelihoods situation of farming communities in Soc Son, who directly depend on clean water to grow crops or feed livestock. The smallholder system of farms, in combination with the absence of natural areas and shared irrigation channels, also leads to the rapid dissemination of pollutants and accumulation of contaminants throughout the system. Another closely related issue is the continued overexploitation of groundwater in the region. With more than 700 drilling wells in Hanoi operated by freshwater supply companies, and an estimated 10,000 privately-owned drilling wheels, around 700,000 m^3 of underground water is extracted every day from Hanoi's Pleistocene aquifer (Nguyen and Nguyen 2003). According to the Water Master Plan for Hanoi, water consumption in the region will rise from the 1999 baseline of 150,000 m^3/day to 1,400,000 m^3/day by 2020 (Nguyen and Nguyen 2003).

Soil quality, the third environmental indicator, received an 'average' rating from most sub-districts except Phu Minh, who share the opinion of having mostly 'good' quality soil in their community. Viet Nam, like many other low-to-medium income countries, is facing problems related to the usage of pesticides and other chemicals in agriculture. In their study on Organochlorine Pesticides (OCPs), Vu et al. (2007) collected sixty soil samples from various districts around Hanoi, including Soc Son and neighboring Don Anh. Their study indicated that despite new legislation that prohibits the use of pesticides such as DDT and HCH, considerable concentrations of pest-control chemicals can be found in

the local environment. Farmers are often insufficiently informed about the usage and application of pesticides and therefore prone to ignoring safety instructions, protective measures and risks (ibid.). They also represent the demographic with the highest dependency on fertile soils to sustain their livelihoods, which are becoming increasingly threatened as land-use patterns are changing within the district.

Further risks include the reliance on one main crop (without rotation), overabundant use of fertilizers, and increasing mechanization. As the Mekong Delta produces 90 percent of rice exports, a majority of rice for domestic consumption and harvests 70 percent of all fruit, the negative consequences associated with unsustainable agricultural production have the potential to cause substantial crop yield losses which may severely undermine local livelihoods and lead to inflated food prices (van Elsacker 2011). In this context, all five communes investigated in this study water pollution was mentioned as the main environmental indicator in need for improvement. This was followed by air pollution, noise and soil. The results support the previous findings, showing that according to village residents in peri-urban Hanoi, water pollution represents the main environmental threat.

Concluding Remarks Natural Capital

Natural capital in Soc Son District represents the main source of income for the roughly sixty percent of respondents who derive their livelihoods from agricultural activities. As most natural capital is limited, prone to degradation, and in the short-to-medium run non-renewable, environmental pollution poses a serious threat to traditional livelihoods. Both primary and secondary data indicate that the natural capital of Soc Son has been progressively degrading more rapidly in recent decades. As a result the region faces a multitude of health and environmental risks related to environmental pollution. While Noi Bai Airport can be considered a perpetrator of polluting practices in Soc Son, including noise and aircraft/vehicle emissions, its current contribution to pollution in the district is minimal when compared to other industries and polluters in the region. Nonetheless, the responsibility of Noi Bai Airport to operate in manner which minimizes its ecological footprint should not be overlooked, especially when considering local livelihoods.

The impact of Noi Bai can be both positive or negative depending on the development model which is implemented: if the airport expands haphazardly and does not prioritize environmentally-friendly practices, it can substantially add to the pollution affecting local communities resulting in further degradation of the existing natural capital. Inversely, if a careful planning is used with specific consideration of environmental impacts, the airport has the potential to alleviate some of the environmental degradation current occurring through modernization and development efforts. For example, improvements in road networks and investments in public transportation can reduce traffic congestion, and the high reliance on motorbikes responsible for a majority of the air pollution. Similarly,

economic growth instigated through airport development can enable nearby communes to erect sewage treatment facilities and reduce water pollution. However, these potential outcomes are highly dependent on the degree of social and environmental responsibility implemented and practiced at Noi Bai Airport.

7.5. Social Capital

Social capital refers to the social resources (networks, claims, relations, affiliations, and associations) upon which people draw when pursuing livelihood strategies that require coordinated action to increase trust and the ability to cooperate among individuals and groups (Scoones 1998; Rakodi and Lloyd-Jones 2002; Kollmair and Gamper 2002). Civil society in Viet Nam is embedded within the organizational unit of the community. This is deeply rooted within the traditions of an agrarian society governed through decentralized forms of leadership. These social structures have existed in the country for millennia and disseminate the implementation of national policies at the village level. Despite the rapid urbanization and development of Viet Nam in recent years, these village structures persist outside large urban centers and define the scope and persistence of social networks (Dalton and Ong 2004).

Recent findings suggest that social group membership in Viet Nam is relatively high, with substantial involvement in organizations as diverse as recreational groups, women's groups, political groups, social welfare/community groups, educational groups, political groups, professional associations, youth groups, and unions. Dalton et al. (2002) support this notion by suggesting that more than one-in-five Vietnamese are members of some form of social organization. In their study on world values, they found that the typical Vietnamese respondent reported to belong to an average of 2.33 groups, which is significantly more than their peers from the Philippines (1.93), Japan (1.41), or China (0.91). This indicates that Vietnamese citizens are socially-well connected and trusting, which are two key indicators of social capital (Dalton and Ong 2004).

The significance of social networks in the study are manifested in two key indicators: job seeking behaviour and political participation. Among airport employees, 43.8 of respondents stated they obtained their job through personal networks, including friends or family. Headhunting agencies (1.9 percent), schools (1.5 percent) or previous employers (12 percent) only play a secondary role in this respect. Concurrently, 37.4 percent of airport employees indicated they had family members who also worked at Noi Bai. In the local communities, the importance of social networks for finding employment is even higher. Here 80.5 percent of the sample had friends or family help them find their current workplace. The remaining options (employment agencies, school, previous employer, other) all remained below five percent each. In this context, family ties seem especially important in the agricultural sector, where 35.8 percent of people work directly for their family. This confirms the findings presented above, which attribute a high level

of social connectivity and close ties between people in Viet Nam — a process which can act as a social safety net during times of crisis, but has also been associated with problems of patrimonialism and corruption.

In terms of political representation in government and public projects, the data collected depicts a contradictory trend. The majority of residents (70,9 percent) living in the five survey settlements did not feel that their social networks or organizational ties were strong enough to mobilize to an extent that can influence decision-making processes at the airport. Especially in the subdistricts of Phu Minh and Mai Dinh people expressed a lack of participatory power with only three respondents feeling they had some kind of leverage in the political and planning processes. The Vietnamese government has acknowledged a need to strengthen participatory action at the local level and introduced various decrees and legal frameworks supporting political participation, the most prominent of which is the 2007 Grassroots Democracy Ordinance (GRDO). In theory this gives people the right to transparency, discussion/contribution of governmental projects, and participation in development programmes (KAS 2010). At the same time the Vietnamese government concedes that "*...the current planning system still uses the conventional methods, targets and plans are still set without adequate allocation of financial resources and without broad participation of the community...*" therein reserving the right to override any decisions locally in true top-down fashion (de Wit 2007: 13). Examples of such decision-making structures include dam projects in Central Viet Nam or the construction of roads in the hinterland (ME 2005; Barrington et al. 2012). Pham Van Hoi (2012), lecturer at the Agricultural University of Hanoi, saw the centralized system and ineffective law enforcement in Viet Nam as the main obstacle to development. According to him the existing public services remain overly bureaucratic and poor in quality, causing ineffective enforcement of the law and corruption.

Concluding Remarks - Social Capital

While there is evidence to conclude that Vietnamese citizens display a high level of social capital and close family ties on a personal and vocational level, the same cannot be said of political participation. Despite encouraging trends that show signs of independence and increasing diversity of positions in political matters (in the wake of modernization efforts and reform), the Vietnamese state retains a monopoly position on participatory processes and projects of national importance. This is manifested in the concept of huy dong (mobilization), which means the government decides upon a certain plan of action or project at the highest levels and in an autocratic manner, while giving the impression of accommodating local populations and their views (de Wit 2007). In this context accountability at all levels occurs predominantly from the bottom to the top. According to findings from the UNDP issues related to political participation can not only be attributed to planners, administrators, and party officials, but also to the lack of experience the local population has in taking part in decision-making processes. This has lead to a certain

degree of passivity and dependence, which, in some cases, has been associated with elite capture, discrimination and exploitation (Fritzen 2000).

Examples of successful community participation/opposition to large government and private-sector projects can be found in many countries with democratic governance. One recent example from the aviation industry includes Munich Airport (MUC), which has been operating at maximum capacity for many years and sought to build a third runway. Community opposition due to environmental concerns, noise pollution and the resettlement of two villages in the airport's vicinity led opponents of the expansion to negotiate a referendum with the state of Bavaria, which ended in a 54.3 percent vote against airport expansion (Sheahan and Choy 2012). This shows how social capital in the form of organized opposition can affect, change, or reverse policies that are implemented by the government. While it is highly unlikely that Soc Son residents will be able to influence decision-making processes with regard to the growth of Noi Bai Airport, further democratization and political reform can foster social capital and enable people to participate in the processes that will shape their futures (see chapter 8).

7.6. Conclusion of Social Analysis

While the economic impact analysis in chapter 7 illustrates that the benefits of Noi Bai Airport are more often distributed outside of local communities (at the regional and national levels), there exist measurable impacts in the local economy. Within the local context, the distribution of these impacts is not uniform, but rather varies between individuals and households depending on the different livelihood strategies they choose to pursue. The strategies are often derived from the capital base available and accessible to residents of Soc Son, who in turn, are forced to make trade-offs between the different types of capital. These trade-offs often result in strategies that rely more heavily on one or two of the capitals. In general, livelihood strategies that build upon physical and natural capital (i.e. people the agricultural sector) exhibited the highest levels of vulnerability to economic modernization. As processes associated with the changing landscape of the local economy gain momentum, fluctuations in land prices, rapid urbanization/urban sprawl, increases in the costs of living and environmental degradation are combining to disadvantage many of the small-scale farmers in the area. In contrast, livelihood strategies relying more heavily on human capital (i.e. people in the services and manufacturing sectors) exhibited higher degrees of adaptability to these same processes.

In order for transportation infrastructure development to achieve sustainable outcomes in peri-urban Hanoi, the planning and design of large projects needs to be particularly sensitive to rural households, a demographic that is often neglected in what increasingly appears to be a two-speed economy. The diminishing availability of physical and natural resources in Soc Son is increasing vulnerability among rural populations, much of which can be attributed to the presence of Noi Bai. Pull factors associated with the airport are

bringing more and more businesses and industries to the area, all of whom compete for limited space with local communities. The reduced capacity of agriculture to provide livelihoods for a rapidly growing population, given the constraints presented in this chapter, is influencing younger generations to seek employment elsewhere in the rapidly growing services and manufacturing sectors. Recent investments in national education systems have shown positive results in Soc Son District. Students are typically attaining progressively higher levels of education, providing the foundation from which to attain other capitals that can improve resilience to the socio-economic changes occurring within the district.

The following chapter will apply a synthesis of the economic and the social analysis to past, present and anticipated future developments at Noi Bai International Airport. By placing an emphasis on vulnerable households, the chapter aims to illustrate that processes of airport expansion and development occurring in Viet Nam and Southeast Asia are creating negative spillovers that disproportionately affect certain groups of people who are often already experiencing varying degrees of marginalization. The concentration of negative impacts in these communities is evidence that governments in the region have yet to reconcile the urgent need for improved transportation infrastructure with the principles of sustainable development.

8. APPLICATION OF FINDINGS

Noi Bai International Airport can, in many ways, be used as a prototypical model of ASEAN airport development and the challenges facing urban planners, airport operators and local populations in Southeast Asia. Rising passenger numbers, regional integration, and increasing economic dependency on global markets all put tremendous pressure on national governments to modernize their aviation infrastructure. In Southeast Asia, most international airports are located in peri-urban zones characterized by processes of urbanization, population growth, environmental degradation, resource competition and economic development. Consequently, their operations have a direct and fundamental impact on people living around them.[54] The data collected during the research, both primary and secondary, indicates that the benefits of airport operation/development are dispersed over larger spatial scales — in contrast to negative spillovers, which are more often concentrated locally.

The uneven spatial distribution of positive and negative socio-economic impacts can also be observed at the local level. Negative impacts are disproportionately affecting groups that are already experiencing varying degrees of marginalization to the new economic opportunities presented by development in the district. Inversely, positive impacts are benefitting groups with access to specific sets of livelihood assets, further reinforcing the dichotomy between traditional rural livelihoods and more modern sectors that persists throughout Hanoi. The socio-economic impact analysis presented in chapters six and seven offers not only a retrospective assessment of airport-related processes which together have contributed to shaping Soc Son into the atypical[55] peri-urban environment of today, but perhaps more importantly, offer a foundation from which the likely outcomes of anticipated longer term developments at Noi Bai can be better understood.

The magnitude of various airport-related impacts have grown alongside the gradual expansion of Noi Bai and associated increases in passenger and cargo volumes. Patterns in the distribution of socio-economic impacts are becoming increasingly clear as the influence of Noi Bai in Soc Son District grows. As the divide between those who benefit and those negatively affected deepens, it is the responsibility of decision-makers to acknowledge and address the aspirations of populations unable to participate in the new economic opportunities presented by the changing economic landscape of the district. As presented in the following chapter, it is often these populations that are also subject to the most negative aspects of airport development. Furthermore, the chapter will illustrate that the careful, context-sensitive and responsible planning advocated by proponents of sustainable airport development is absent in the development model of Noi Bai currently envisioned for the period after 2015.

[54] See Appendix II for a table with related data on major airports in Southeast Asia

[55] In relation to other peri-urban areas in Hanoi, which continue to be much more rural in character.

The first stage of modern development at Noi Bai began with opening of Terminal 1 in 2001.[56] Prior to the construction of Terminal 1 the local socio-economic and environmental impacts can be assumed to have been minimal: the airport authority did not need to procure additional land, small passenger volumes did not require a large workforce, and associated environmental spillovers were not significant due to the low frequencies of commercial airline traffic and associated activities. Significant impacts first began to emerge after completion of Terminal 1 as passenger volumes more than double within a few years of the terminal's opening, requiring more on-site staff and offsite suppliers/support services to accommodate the substantial increase in arrivals and departures. The general increase in airport-related activities meant that their footprint of these activities in local communities grew proportionately.

Figure 45. Noi Bai Airport Terminal 1 (Bui 2011)

At this stage, rural livelihoods were not threatened by the presence of Noi Bai as the airport did not impact accessibility to the physical and natural capital required to sustain farming households. Rather, improvements in physical infrastructure facilitated access to urban markets, new income opportunities outside of agriculture were created, and new local markets[57] for agricultural products emerged. Combined these factors provided more avenues through which local people could find employment and earn income, despite in

[56] The 90,000 square meter facility (including aprons and ancillary buildings) was designed to accommodate up to 6.5 million passengers a year and handle peak periods of 4000 passengers an hour (AT 2012).

[57] The rapid growth of passenger numbers, increased the demand for inputs to the catering services offered but at the airport and on airlines travelling to and from the region.

many cases being limited by low levels of human and financial capital. These limitations often resulted in people from outside the district, either in the greater Hanoi area, or from other provinces, capturing many of the new employment opportunities in Soc Son. Nevertheless, the general opinion of residents in Soc Son regarding the economic contribution of the airport to the local economy was positive.

Figure 46. Location of Terminal 1 at Noi Bai International Airport.

In each sub-district, the consensus of residents indicated that the airport both increased demand for local goods and services, and created new opportunities to generate income. A similar consensus was found between people working in agriculture and services, illustrating positive spillovers in both sectors. The data analyses highlighted substantial socio-economic differences between subgroups in the district sample; however, all of them remained positive to the economic impact of Noi Bai. From the poorest farmers of Phu Cuong to the richest businessmen of Mai Dinh, there was a shared sentiment that Noi Bai was important to the local economy. Even in communities such as Quang Tien, who were much less positive toward the local economic contribution of Noi Bai, all respondents wanted to see further investments at the airport.

While felt locally, the positive processes associated with airport-induced economic development are primarily dispersed over larger spatial scales (from the local to the national) and relate to the overall productivity, competitiveness, and connectivity of an economic system. In contrast, increases in flight movements and airport activities are

often associated with a number of negative impacts including pollution, urban sprawl, land scarcity, and congestion, which are often concentrated at the local level. If left unchecked these processes can negatively impact the quality of life in communities living close to the airport, increase household vulnerability to processes of modernization, and undermine the traditional foundations of local livelihoods. Many of these negative processes were shown to have a strong presence in the local community sample, indicating that more and more people are beginning to experience the unsustainable by-products of modern airport operation.

Figure 47. Area Used for the Construction of Terminal 2.

The original design of Terminal 1 was intended to accommodate substantial increases in passenger numbers by providing infrastructure capable of servicing more than twice the volume of traffic experienced at the time of inauguration. However, even with the substantial increase in passenger-handling capacity, the new ceiling was reached in less than six years - elaborate on what this says about airport planning and how to avoid such pitfalls in the future. With passenger numbers continuing to grow at some of the highest rates recorded around the world, by 2011 Noi Bai serviced 11 million travellers (despite being designed for a maximum of 6.5 million passengers annually). In response, the Vietnamese government introduced plans for the development of a second terminal to serve international passengers, while recommissioning Terminal 1 for domestic flights. The new facility will cover an approximate area of 140,000 m² and is intended to accommodate 10 million additional passengers per year by using advanced technologies such as computer-controlled luggage processing and automated check in systems that

improve both handling efficiency and transit times.[58] The total costs for Terminal 2 are estimated at USD 236 million and have been funded entirely by the Japanese Government through Official Development Assistance (AT 2012; JICA 2011). Figure 47 illustrates the land used for the current expansion of Noi Bai Terminal 2 — expected to be fully operational by 2015.

In order to expand, the airport was in need of land which it acquired from the neighbouring sub-districts of Phu Cuong and Thanh Xuan. With land laws in Viet Nam stating that the government can recover land rights from private individuals or organizations as well as from public entities such as districts, communes or villages, there was little choice afforded to local communities in the decision to relinquish their land to the airport (NA 2004).[59] At the time of the research, the compensation schemes had not yet been made publicly available due to delays in the arbitration process (Huu 2012). However, land laws in Viet Nam state that the government must monetarily compensate the holders of land-rights for the value of the land, as well as provide 'support upon land recovery' initiatives including training in new occupations, arranging new jobs, and funding relocation (NA 2004). While the final outcome of the 'recovered' land-rights is not yet clear, these ongoing processes entail new impacts for specific subsections of the sample population.

The construction of Terminal 2 represents a shift in the distribution of socio-economic impacts within local communities. In the first stage (T1), the airport did not reduce the quality or quantity of livelihood assets available and accessible to people living around the airport. Instead, the airport offered new opportunities for people to apply certain types of assets (e.g. education), improved access to markets by upgrading public physical capital (e.g. roads), both of which benefitted some groups of people more than others (agriculture vis-a-vis services) but did not negatively impact any one group disproportionately. With the construction of Terminal 2, the general population will benefit with more jobs created both on-site and with more ancillary businesses settling in the area, however, in this phase specific sub-groups in the sample will begin to be negatively impacted more severely than others.

The sub-district of Phu Cuong, where most of the expansion is currently occurring, was found to have the largest proportion of residents engaged in agriculture within the sample. Respondents from Phu Cuong working in agriculture were typically found to be older, have lower levels of education, possess limited financial capital, and rely almost solely on physical and natural capital to earn a living. These farmers were also found to be among the poorest in the district-wide sample. The loss of land represents a serious reduction in their capacity to continue to pursue the livelihood strategies they have

[58] The groundbreaking ceremony for Terminal 2 was held in December 2011.

[59] The Law on Land regulates the administration and use of land in Viet Nam and is publicly available in the English language under www.vietnamlaws.com/freelaws/Lw13na26Nov03Land[X2865].pdf.

depended on for most of their lives. Even with fair compensation payments that take into consideration the rising values for land in the area and guarantee recipients can maintain or improve their living standards in the short term, in the medium to long term the loss of land and the low levels of education may result in the increasing marginalization of these households, who already display high vulnerability to economic shocks.

Two examples have been found that can help illustrate how rural populations working in agriculture try to cope with large-scale infrastructure development and the associated loss of land. In their study on resettlement and food security in central Viet Nam, Pham et al. (2011) linked the loss of agricultural land to a reduction of natural capital and common pool resources available to the local population in the area. This decreased their ability to grow food and forced families to buy foodstuffs they could previously produce themselves, depleting their financial capital over time. As a result many affected people had to engage in difficult to find wage labor, often as seasonal laborers in large farms, or try to obtain employment in the metropolitan centers close to the coast. Based on these findings, Pham et al. (2011) concluded that standard compensation packages provided by the Vietnamese government and investors will not lead to sustainable livelihoods outcomes for the local population unless additional development assistance is provided.

The next example is provided by Van den Berg et al. (2003), who researched the effects of urbanization in the greater Hanoi region on the livelihoods strategies of farmers. They discovered that as land suitable for cultivation becomes increasingly scarce, agricultural production is frequently intensified. In practice this means that farmers switch from rice cultivation to producing vegetables, pork, or fish, all of which offer higher monetary returns per hectare/hour of work. Alternatively, they recorded livelihood strategies in which farmers used compensation money to move their production further out into the countryside, or, as prices for land increase, rent part of their property to newcomers to generate additional income. Inversely, waste and effluents from newly built-up areas have been linked to increasing contamination in foodstuffs and drinking water, lowering the quality of agricultural produce. At the same time farmers were often confronted with intransparent land valuation procedures and knew that the land they were compelled to sell would fetch substantially higher prices after the next phase of development. While these examples are derived from two different geographic settings (rural vs. peri-urban) they show that populations working in agriculture employ various coping mechanisms when faced with the loss of land. Perhaps more importantly, both studies illustrate that economic modernization and monetary compensation do not necessarily lead to sustainable livelihood outcomes for the farming households who lose their land or parts thereof.

As the economy of Soc Son District expands and diversifies alongside developments at Noi Bai, new employment and income opportunities will become available. These opportunities typically present themselves to younger, well-educated and more mobile

local populations who are likely to face increasing competition from newcomers to the district. This can be attributed to two main reasons: first, with the expansion of the airport the local economy is expected to see more investments (both from the private and the public sectors) than the surrounding districts and therefore creates more opportunities for new employment. Areas undergoing economic growth commonly attract migrants. Second, with the continuous modernization of Viet Nam more and more people move to the large urban centers, many of whom settle on peri-urban land as the price for land and housing in these areas is lower than in urban centers. While the majority of the local community sample did not indicate that the arrival of newcomers threatened their ability to earn a living, the increasingly technological-, services- and manufacturing-orientated nature of new developments in Soc Son is likely to benefit only a minority of the local workforce as it exists today. The emergence of industrial parks, business centers, and special trade zones in Soc Son cannot compensate farmers for the loss of land associated with these developments unless they are able to participate in new income-generating activities associated with their arrival.

Beyond financial aspects, physical connectivity plays a fundamental role in the attainment of livelihoods. The development of Noi Bai Airport will bring significant improvements in road infrastructure and public transportation, two components of physical/public capital that have remained underdeveloped in Soc Son District to the present day and make it a 'low accessibility zone' with respect to Hanoi. The upgraded and new road networks to be constructed over the coming years will facilitate market access for agricultural producers and reduce transportation costs throughout the area, while at the same time enabling people in services to increase their potential market coverage. Especially in the southern sub-district of Phu Minh, where the Noi Bai Expressway and Metro Rail will enter Soc Son District, infrastructure investments will provide more direct access to the urban markets of Hanoi. Additionally, the implementation of a more sophisticated public transportation system may encourage local residents to reduce their reliance on motorcycles as their main means of transportation. In the long run this can lower the levels of traffic congestion frequently cited as the main source of air pollution, and increase road safety in the area.

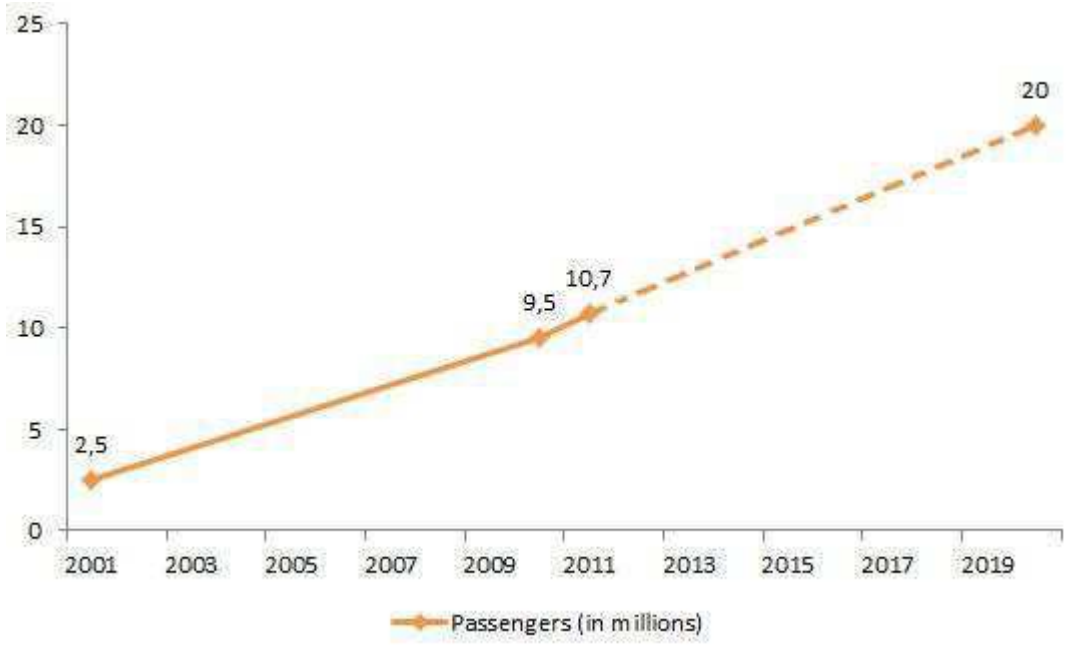


Figure 48. Passenger Volume Noi Bai Airport (Past and Projected).

Viet Nam represents one of the fastest expanding civil aviation markets in the world today, and growth is expected to continue at similar or stronger rates in the coming decade. Concurrently, the importance of Noi Bai Airport to the wider economy is illustrated by the fact that it represents the only international gateway to northern Viet Nam and the capital city of Hanoi. When Terminal 2 will be opened in 2015, Noi Bai Airport will have the capacity to host around 16.5 million passengers annually. However, recent traffic forecasts suggest that despite the substantial increase in passenger capacity, the intended maximum capacity may be surpassed as soon as 2017 (see figure 48).[60] Aware of the need for more infrastructure at Noi Bai, the national government and airport authority have revealed a master plan with an outlook to 2020 and beyond. In this context Terminal 2 represents the first stage of a much more ambitious plan to transform Noi Bai into a major regional hub in Southeast Asia comparable to Singapore Changi or Bangkok Suvarnabhumi.

The current master plan was designed and developed by Japan Airport Consultants (JAC) and the Japan External Trade Organization. In 2008 the construction approval was granted by Vietnam's Deputy Prime Minister Hoang Trung Hai (Dong 2011; NAIC 2008). The Japanese influence in the design of the both Terminal 2 (figure 49) and the layout of planned expansions (figure 50) have resulted in future developments at Noi Bai closely resembling the configuration and style of Kansai International Airport in Japan (Airis 2011). At its inception more than 30 years ago, Kansai represented an innovative response to the challenges presented by the need to provide aviation services in densely populated urban areas faced by increasing land scarcity. Therefore the airport was built on an artificial island created with landfill material two kilometers off the coast in Osaka Bay.

[60] It took Terminal 1 six years to reach maximum capacity, according to current forecasts it will take only two to three years for the much larger Terminal 2 to reach maximum capacity.

Since its completion in 1994, Kansai has faced recurring issues related to the slow but continuous sinking of the man-made island that makes it vulnerable to inundations by the sea. This has, in part, contributed to high operation costs, and subsequently a low demand by airlines to use the airport (Duenwald 2008; Al Badri 2003). As a consequence, Kansai has been the target of strong criticism for recording steady losses while at the same time representing one of the most expensive airport projects ever undertaken in the history of aviation (Bowen and Cidell 2009). Nonetheless, its innovative approach to land use planning set a precedence for other airport authorities faced with land scarcity and prompted Hong Kong to use a similar concept, albeit with greater success.

Figure 49. Exterior Design of Terminal 2 (VAT 2012)

The decision to rely on plans that were drafted more than 30 years ago for a highly-developed city in Japan is not indicative of the careful context-specific planning required to achieve sustainable airport development. For all the differences between models and methods advocated in airport sustainability literature and reporting, and the general lack of consensus, most theoretical frameworks agree that individual airports need tailor-made solutions specific to the challenges and opportunities of the area. Transplanting an outdated airport model constructed on a manmade island isolated in Osaka Bay to a peri-

urban setting in which the airport competes for space with a growing rural population is unlikely to result in sustainable outcomes. This is especially pertinent as Kansai's history of operational inefficiencies and high costs have yet to be solved.[61]

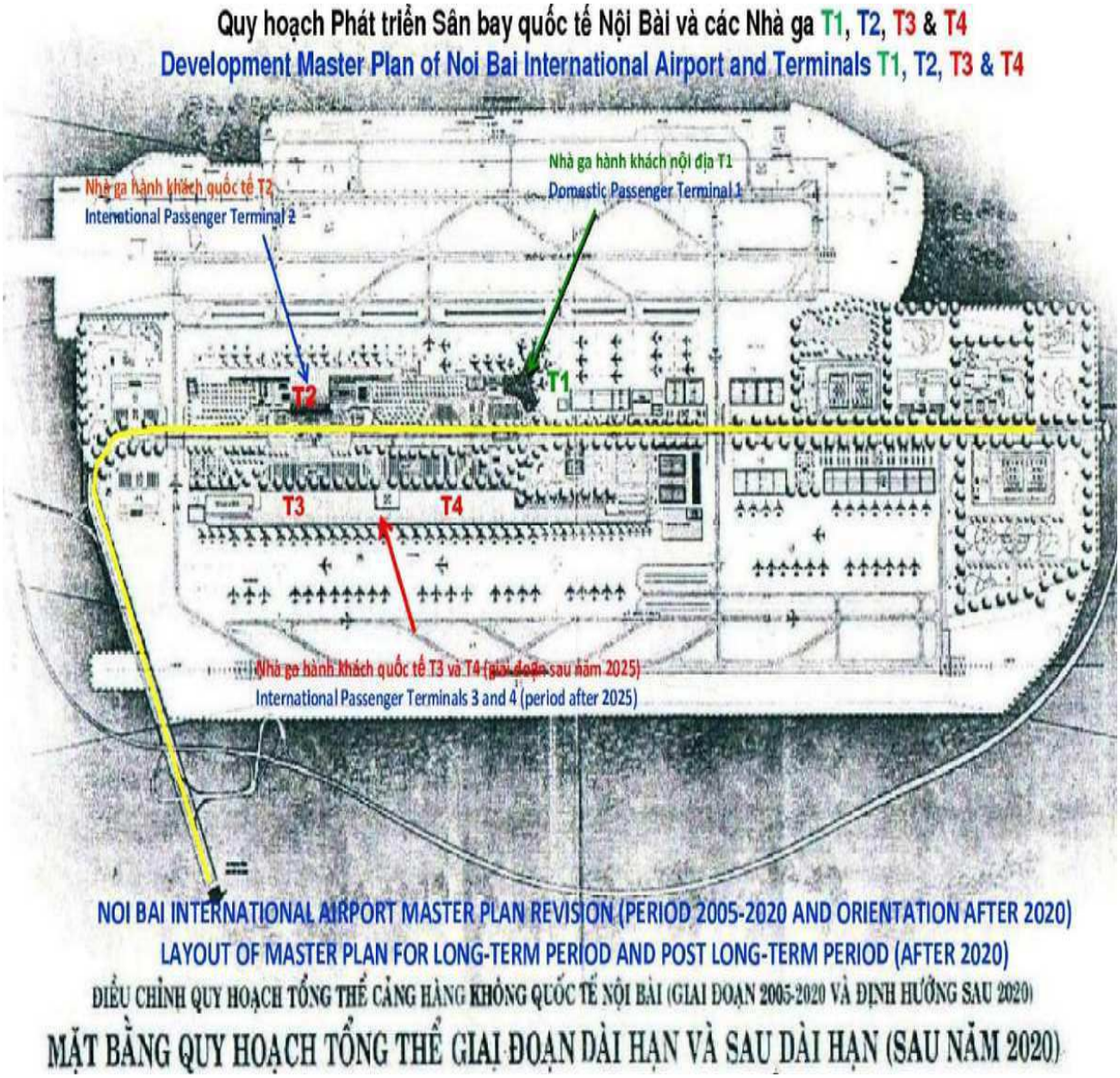


Figure 50. Master Plan of Noi Bai (Airis 2011).

The flow of passengers through the terminals of Kansai is impeded by inefficient concourse planning that create long check in and security control queues; once passed, these give way to large passenger waiting areas that make poor use of the limited space provided (Diaz 2008)[62]. Since Kansai was first conceived the aviation industry has transformed from a '*full-fare full service*' model to the more recent '*low-fare/pay-for-added-*

[61] Kansai operators recorded a loss of over 120 million USD in the first half of 2012, adding substantially to the dept of 1 trillion yen the airport has accumulated (JT 2012; Shimbun 2012).

[62] At Kansai Airport waiting for available check-in counters and security screening accounts for over 80 percent of passenger's total waiting time.

services' system found today. In this context the increasing commercialization and privatization in the aviation industry has forced airports to revise their businesses model and rely much more heavily on revenue from on-site concessions to remain profitable. If Kansai is still struggling to become profitable after more than 30 years, why should this failing model be expected to succeed in a foreign environment? Short-term pressures to address the infrastructure bottleneck at Noi Bai may lead to a preference for immediate and easy-to-implement solutions, as exploring alternatives may be seen as too time-consuming or costly. This raises the question: what does the current master plan imply for people living in local communities if this model of development is pursued?

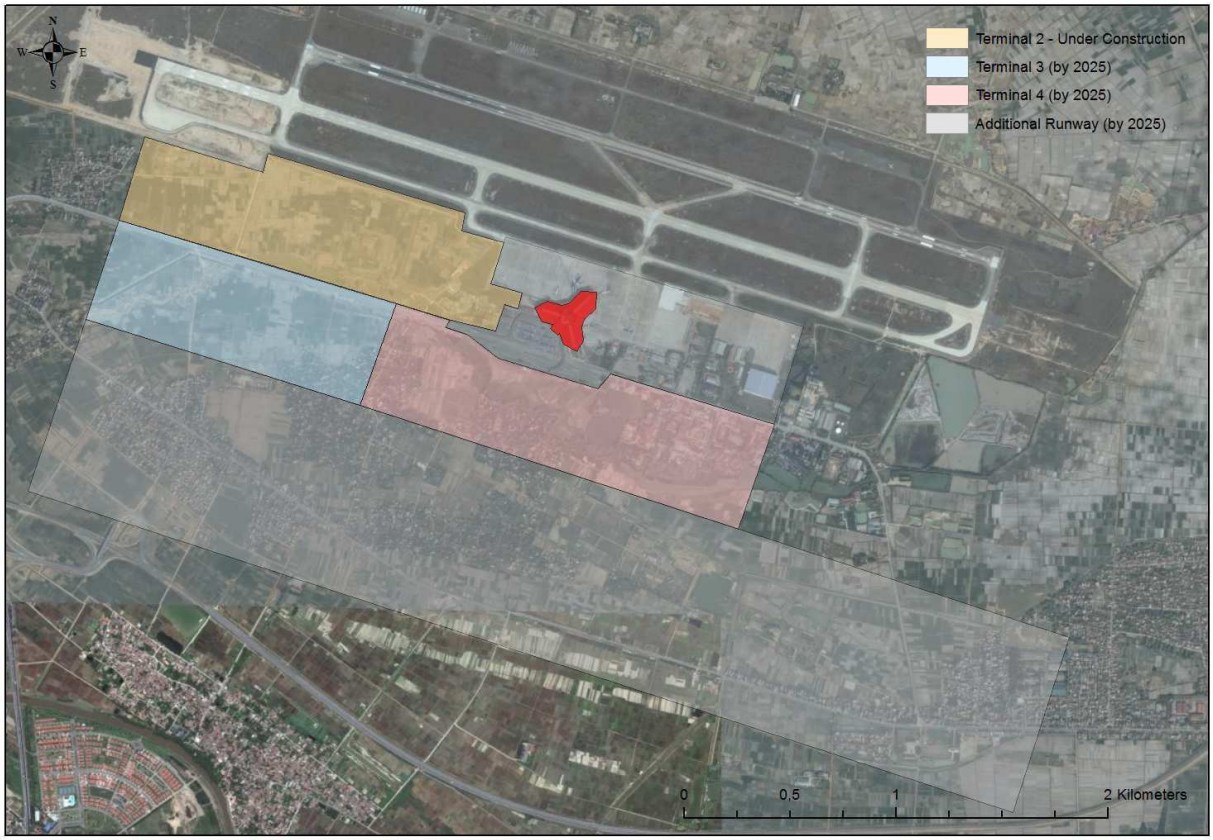


Figure 51. Full Extent of Noi Bai Airport Expansion after 2020.

The residents of Thanh Xuan, Mai Dinh, and Quang Tien are likely to experience similar impacts to those already present, most of which will grow in magnitude alongside increases in passenger volumes. While pollution associated with the airport and competition for land may increase, these communities will still be able to continue to pursue more traditional rural livelihood strategies or participate in the modern sectors of the local economy that are steadily gaining importance. For people living in Phu Minh and Phu Cuong it will be an entirely different story: as shown in figure 51 (and in closer detail in figure 52) many of these communities will cease to exist. The future expansion of Terminals 3 and 4 in addition to the construction of an additional runway requires the recovery of just under four square kilometers of developed residential settlements as well as large areas of smallholder farming plots. The potential recovery will occur in

communities that, within the sample, displayed high dependencies on the physical and natural capital required to sustain agricultural livelihoods. These communities also exhibited some of the lowest income levels and highest degrees of vulnerability to economic shocks in the district-wide sample. In other peri-urban areas around Hanoi, who have experienced first hand the impacts of land recovery and displacement due to large state-sponsored development projects, the outcomes have not been positive.

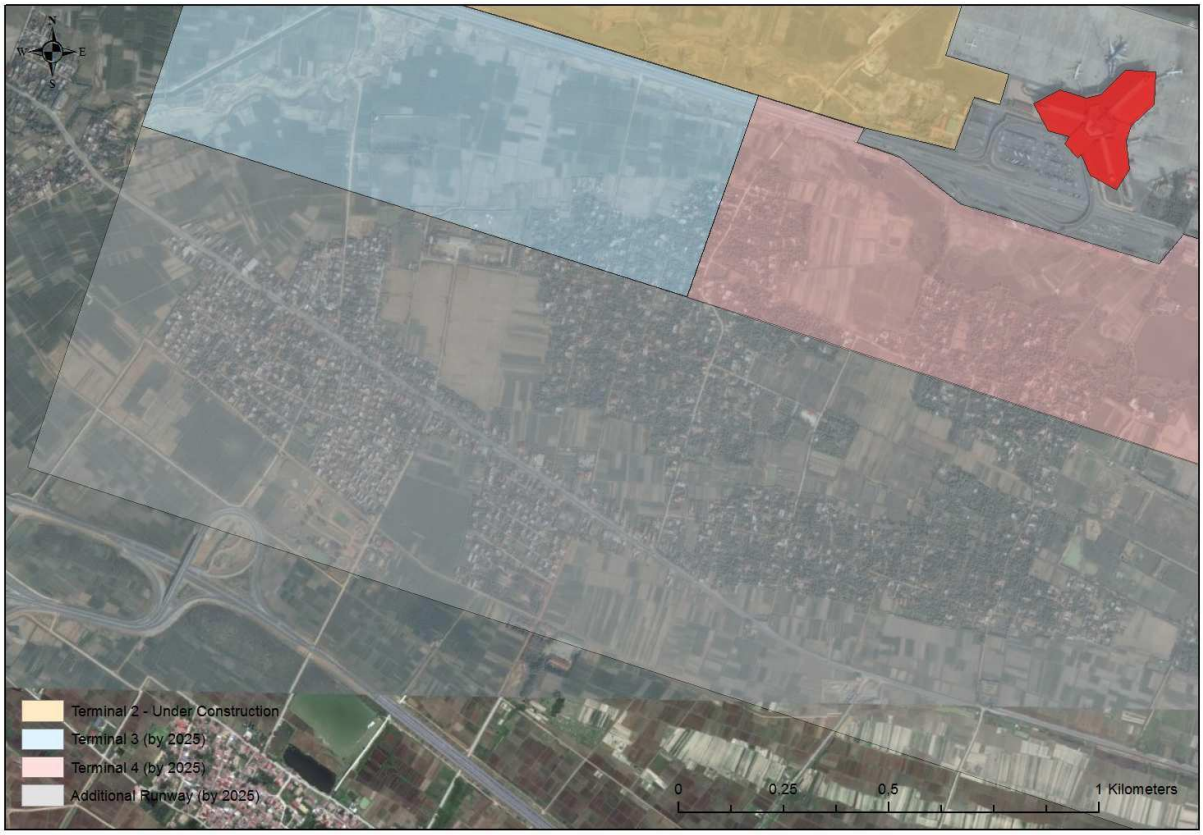


Figure 52. Map of Phu Cuong showing areas that are expected to be cleared for the construction of Terminals 3 and 4 as well as the additional runway.

In academic literature two projects stand out as representative of many of the challenges faced by infrastructure developers/investors, and, on a different level, local populations living in/close to where these projects are realized. These include 'the Manor' in the western suburbs of Hanoi, and the Van Tri Marsh Golf Course in Dong Anh District. Both projects involved multi-faceted compensation issues and were accomplished as a combination of local and foreign investments (Han and Vu 2008; Labbe 2010). The Manor represented the first high-end mixed development project in Hanoi and was finished in 2007 on a 4.2 acre site on the western fringes of the capital. The construction land belonged to two groups of people: local residents who had been living on the site for extended periods of time and individuals (including government officials) who bought land-rights speculating on rising prices. SUDICO, the company charged with the task of acquiring the site from the plot holders, extended a buying offer based on the price level set by the government for agricultural land. As this was significantly below the expected land value, most local tenants declined the offer. This prompted the company to seek help from the Hanoi People's Committee and demand compulsory acquisition. Ultimately

this led to riots among the local population and serious delays of the project. A solution could only be found after Viet Nam's former prime minister Phan Van Khai declared the Manor of strategic importance for the development of Hanoi, enabling SUDICO to negotiated successfully with 70 percent of local tenants while evicting the rest using police force (ibid.).

Figure 53. Aerial Photograph of a community in Soc Son District (Kutcher 2011).

Van Tri Marsh Golf Course, the second example, is a 128 hectare recreational facility halfway between Hanoi and Noi Bai Airport, including an eighteen-hole course and 215 residential villas (VTMGC 2012). Conceived as an incentive to stimulate economic development in peri-urban Dong Anh District, the largely agricultural land required for the golf course was classified for public use with prices fixed at 22,405 VND/m² (~1.05 USD). After initial differences with the local residents, an agreement was signed in late 1998 with the company paying a total of USD 3.3 million for site clearance and compensation (Han and Vu 2008). Shortly thereafter Daeha, the main investor, had to cancel its involvement in the project due to financial difficulties and abandoned the site. Over the next two years ownership was restructured and new projects partners found. Meanwhile the Vietnamese government introduced new legislation on land clearance and compensation, increasing the value for land in the area. As the tenants received this news, more than 600 households started an occupation of their former land in protest of the low price they had received initially (VIR 2002). When Thailand Noble, the new investor, tried to resume work on the site, they encountered serious opposition that culminated in riots and led to the arrest of sixteen people and numerous casualties. After the riots and accompanying court cases each displaced household received an additional VND 9.4 million (Han and Vu 2008).

Both cases are representative of the wider implications of large-scale construction projects and infrastructure development in Viet Nam. On the one hand, there is the Vietnamese government composed of political elites that take a strong stance in favour of modernization and foreign investments to foster the competitiveness of the national economy within the ASEAN. This involves strictly hierarchical decision-making structures that, despite ongoing reforms towards democratisation, remain inherently top-down and envision political participation only to a very limited degree. On the other hand, there are large parts of the population exposed to a rapidly changing economic environment that is in the process of transitioning away from traditional rural livelihoods toward a more diversified economy. Over the past decade, this process has been occurring at an unprecedented pace especially in the large urban centres along the coastal plains. The expansion plans of the Vietnamese government for Noi Bai represent another example of how top-down planning can be exclusive of the local population and their livelihood situation – a process which according to the sample they have little to no control over.

Alternative Solutions

While sustainable airport development may still be in its infancy with little consensus on what exactly constitutes sustainable practices, numerous studies have advocated the use of solutions sensitive to the local context. In order to implement such an approach, urban planners, political decision-makers, and local/foreign investors should conduct feasibility studies that take into consideration both the social and the economic costs of airport development within a specific geographic framework; rather than relying on a generic template that may work in one region but is not likely to achieve sustainable outcomes in another. The previous section demonstrated that should the current master plan continue to be implemented in Soc Son District, large-scale resettlements of local communities throughout the mostly agricultural sub-districts of Phu Minh and Phu Cuong will be required. To address this issue the following section seeks to present an alternative solution that, from a human development perspective, may reduce the negative impacts associated with future expansions of Noi Bai Airport.

Infrastructure development at Noi Bai has always lagged behind passenger growth rates, making it likely that the pressure to expand further will begin to mount around 2016-17 (when passenger volumes are expected to exceed the combined capacity of Terminal 1 and 2). This means that the preparations and planning procedures with regard to the current master plan will soon advance beyond the design phase, presenting a relatively short timeframe for urban planners and the government to revise current approaches. In this context it is important to note that this research acknowledges the fundamental importance of Noi Bai Airport to the socio-economic well-being and development of northern Viet Nam — a process which would be constrained if Noi Bai were not able to expand. However, this goal can also be achieved using a potentially more sustainable

approach than the current plan promoted by JAC and the Vietnamese government. Specifically, this research criticizes the lack of consideration shown for people living in the immediate vicinity of the airport, who will have to bear most the the negative impacts (economic, social, and environmental) with regard to airport operation and development, both in the short and the long run. So what can be done to avoid or minimize the negative social aspects of airport development in the context of Noi Bai Airport?

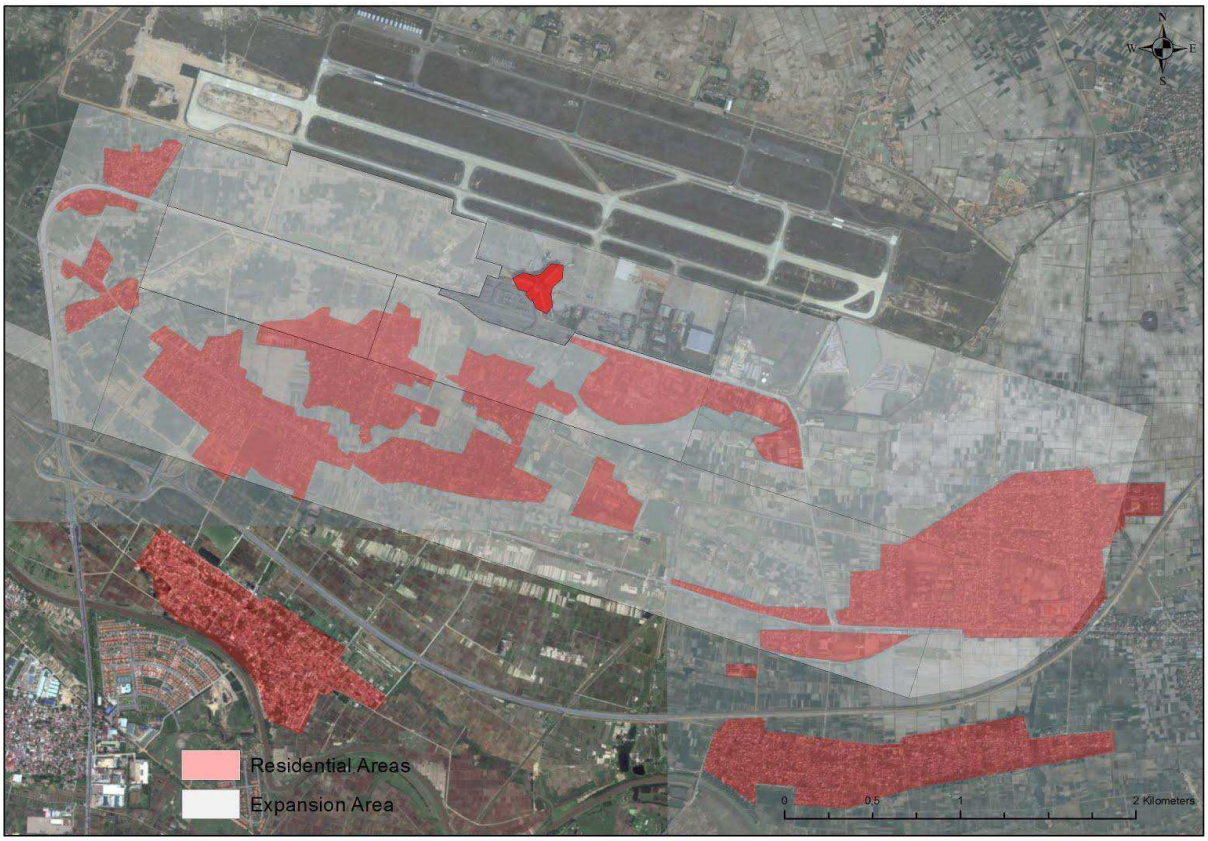


Figure 54. Residential Areas to be Removed due to Airport Expansion

One such opportunity consists of redirecting the airport's expansion plans to the north of Soc Son District. As can be seen in figure 54 the current master plan entails the relocation of twelve small-to-medium-sized residential areas in the south of the district, which combined have an estimated total surface area of around four square kilometers. If this plan becomes reality, Phu Cuong and Mai Dinh will practically cease to exist in their current form as the majority of land will be integrated into Noi Bai Airport. In contrast, the northern sub-districts of Mai Dinh and Quang Tien display significantly more undeveloped spaces in the vicinity of the airport[63] and would not require the resettlement of local communities. While even in this alternative scenario land available for agricultural use would be reduced, when compared with the forced displacement of hundreds of households, it represents the least detrimental option. With well-conceived support

[63] According to the existing master plan Terminal 3 and 4, the new runway, and additional construction at Noi Bai will require roughly ten square kilometers of land; the same amount of land is available to the north and east of Noi Bai without infringing on current developments except Noi Bai Free Trade Zone.

programs that focus on human capacity development and fair compensation schemes, the livelihoods of those affected in the north will experience shocks but not be completely undermined by relocation. Similarly, Mai Dinh, the sub-district in which the large majority of development would take place, also recorded the highest level of service employment in the sample, making its population more adaptable to a reduction of farmland and economic modernization as compared to their peers from southern Soc Son. Figure 55 displays the undeveloped land to the north and east of the airport, with Noi Bai Industrial Park as the main physical obstacle to the alternative expansion scenario proposed in this section.

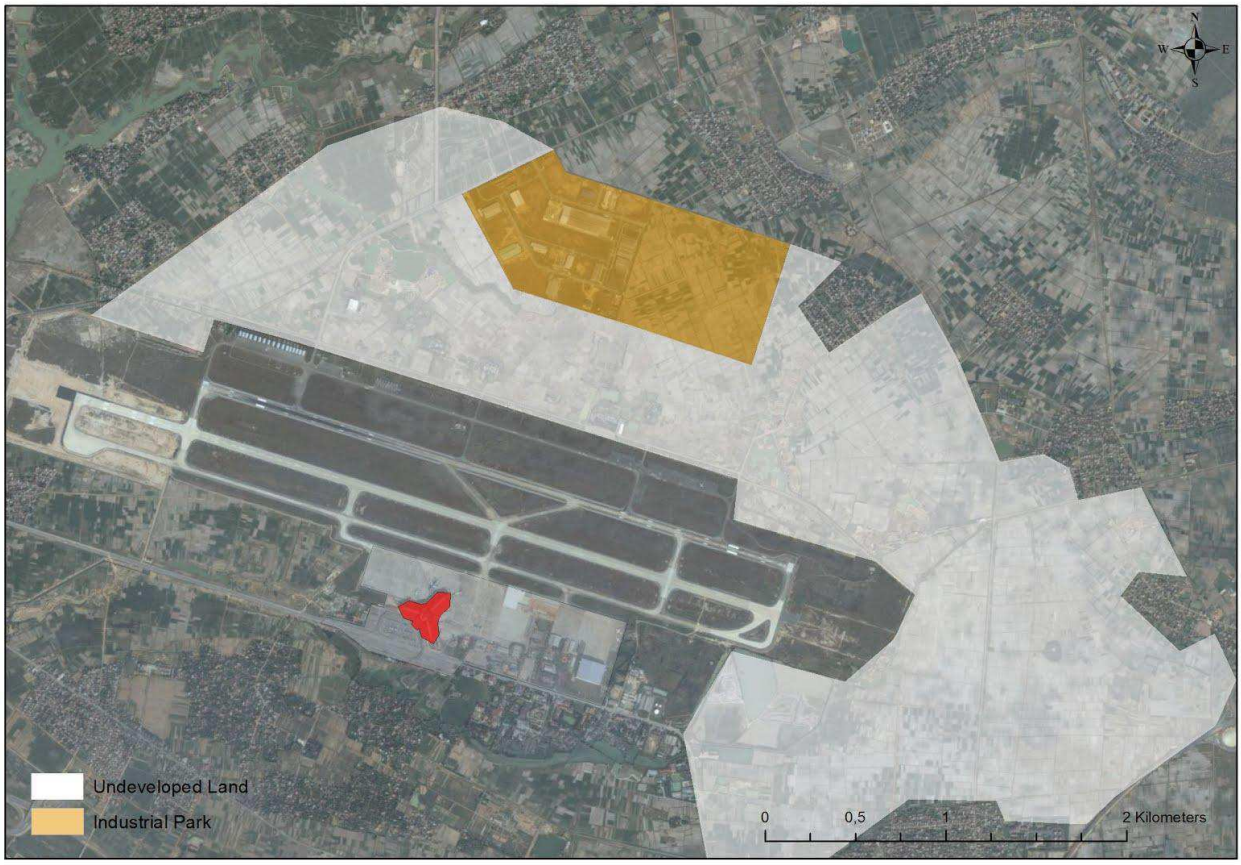


Figure 55. Undeveloped Land and Noi Bai Industrial Park

Noi Bai Airport operates two parallel runways located 250 meters apart.[64] Their closest distance to residential areas is 700 meters to the west, 1.2 kilometers to the north, and 1.5 kilometers to the east. As an additional runway will be required to meet the growing demand of civil aviation in Noi Bai, this makes the area to the north east most suitable for airport expansion. Based on the internationally binding guidelines of ICAO, the length of the runway shall not be "*...less than the longest length determined by applying the corrections for local conditions to the operations and performance characteristics of the relevant aeroplanes …"* (ICAO 1999: 28). In order to fulfill these requirements for the largest aircraft (i.e. the Airbus A380) the new runway will have an expected length between 3000 and 4000 meters. The minimum

[64] The new runway (CAT II - 11R/29L) was opened in August 2006 and is located in the center of Noi Bai. The old runway (CAT I -11L/29R) is 600 meter shorter and located behind the new facility (IHT N.d).
64

distance between the new parallel runway and the existing facilities depends on various factors including dependent/independent use, mode of operation, and staggering. Based on these conditions the minimum distance varies between 1035 meters for independent parallel runways and 760 meters for segregated parallel operations (i.e. one runway remains reserved for takeoffs and the other for landing). For segregated parallel operations, the minimum distance between runways can be lowered by 30 meters for every 150 meters that the landing runway is staggered toward the arriving plane, to a minimum of 300 meters, and vice versa (ICAO 1999). While no data on the precise requirements and corrections for local conditions at Noi Bai were available, it is expected that Noi Bai Industrial Park, located 650 metres from the airport, would have to be relocated even if the new runway were to be staggered to the east.

Noi Bai Industrial Park has been the target of recent large-scale investments by both foreign and local companies, most of which will only offer returns in the medium-to long-term. Therefore the Vietnamese government and tenants of the industrial park are likely to oppose their relocation on economic grounds. If measuring the cost of compensating, relocating and providing training programs to the hundreds of local households against the costs of moving an industrial facility (including warehouses and factories) purely based on economic rationales, the decision is likely to favor moving the communities. In contrast, from a human development perspective that acknowledges the social costs and responsibility of the state to support those exposed to relocation, the outcome may be different. Economic integration and the opening of national markets to global forces has significantly increased competition for foreign investments across Southeast Asia. As a result the Vietnamese government may prioritize a safe and accommodating investment climate for multinational companies over the aspirations of its citizens living in Phu Minh and Phu Cuong. Within this system, international corporations (intentionally or unintentionally) have a direct impact on the fate of local communities — demonstrating how globalizing processes permeate the local level throughout the developing world.

Concluding Remarks

The evolution of airport-related socio-economic impacts in Soc Son District highlight a worrying trend: negative impacts are growing in magnitude and becoming increasingly concentrated at the local level. The motivation for expanding Noi Bai airport is justified in the economic contribution it provides across regional and national levels; however, most benefits remain dispersed outside of the communities most negatively impacted. Within these communities, households in the southern sub-districts of Phu Cuong and Phu Minh will be severely disadvantaged by the planned expansions, while others remain unaffected or even experience positive outcomes. This is due to the younger generations' growing adaptability to changes in the district, who, as a result of investments in the education system, are increasingly finding employment outside of the agricultural sector. Despite these trends a large portion of people living in Soc Son District continues to depend heavily on traditional livelihood strategies, which also makes them vulnerable to

the loss of land, environmental degradation and increases in the cost of living associated with the airport. It is to these people that decision-makers need to pay special attention so as to not counteract the positive processes that have seen many of these households experience rising levels of income and standards of living in recent years.

For the process of airport development in Soc Son to begin to adhere to the principles of sustainable development ratified by the Vietnamese government in regional and international agreements, responsible and context-specific planning is a prerequisite. There exist alternative solutions that provide opportunities to transition in this direction; however, short-term pressures may blind airport authorities and the government from long-term consequences. The use of generic models of development such as the Kansai-based master plan will reinforce the uneven distribution of impacts between different spatial scales, bringing about a situation in which the region benefits at the cost of the communities that will ultimately be displaced. In contrast, sustainable airport development in this context would entail that negative impacts in local communities diminish over time alongside development at Noi Bai. If the resettlement of communities can be avoided or reduced by expanding the airport to the north, an important step towards more sustainable infrastructure development could be achieved.

Throughout the developed world, airports have taken the initiative to improve aspects of their operation to reduce their ecological footprint and social impacts without compromising their central function of bringing people and places closer together. While Noi Bai is in a position to be a leader in innovation solutions to the challenges associated with expanding in densely populated urban peripheries, resource and time constraints seem to override a general willingness to do so. Therein airport expansion and modernization provides an opportunity to create new workplaces for the local communities and help the younger generations transition into the more modern, service-based economy. Well-planned compensation schemes, on the other hand, can help the part of the population who lose agricultural land to reorganize their livelihoods strategy and provide outcomes that are sustainable in the long-run.

9. CONCLUSION

Airport operation and development in Southeast Asia is at a crossroads. In order to maintain high levels of socio-economic development and improve national competitiveness within an increasingly globalized economic system, governments throughout Southeast Asia are investing heavily to modernize their outdated and frequently under-dimensioned aviation facilities. While this has been found to benefit countries at the national and regional level, the socio-economic impacts of this process on people living in the vicinity of airports has seldom been documented in academic literature. At its inception the research, as an exploratory study, was expected to uncover strong linkages between the principles of sustainable development officially adopted by both the ASEAN and the Vietnamese government, and the development of transportation infrastructure in the region. In hindsight, there is very little evidence, if any, to support this notion. In contrast, the findings indicate that in the case of Noi Bai Airport serious considerations of sustainable development and longer-term planning were excluded from the design phase.

This presents an alarming trend, which, if replicated throughout Southeast Asia, would have serious detrimental impacts on the low-income populations that typically live around major airports in the region. The application of generic development models that do not take into account the specific characteristics of the different locations they affect ensures that at the local level much of the progress in poverty alleviation and improved standards of living experienced throughout the region will risk being compromised. The presence of Noi Bai International Airport has shaped Soc Son District to share very few similarities with other peri-urban areas around Hanoi. The airport is attracting industrial development and economic diversification within the district, contributing to the emergence of a relatively large and expanding service sector. While the majority of economic benefits were found to be dispersed outside of the local context, a portion of airport-related revenues are captured locally and represent an important stimulus to the local economy — to some extent even within the more traditional agricultural sector.

The research findings indicate that socio-economic impacts differ between population groups depending on their access to and combination of livelihood assets available to them in Soc Son District. Most notably, traditional livelihood strategies which rely primarily on physical and natural capital were found to exhibit high levels of vulnerability to the changes taking place around the airport. In contrast, accessibility to human capital provided the single-most important determinant of adaptability to the changing economic structures of the district. Livelihood strategies which rely on formal education to provide access to employment in the services and manufacturing sectors were often found to provide higher levels of income, shorter working hours and independence from shocks expected to occur in the agricultural sector as available land and productivity diminish. Therein the capability local populations to benefit from the employment and income

opportunities generated by airport-related activities were severely constrained by the level of human capital available to them.

As many peri-urban communities throughout Southeast Asia gradually transition away from a dependence on agriculture as their main source of income, rural communities employing more traditional livelihood strategies are often found to exhibit higher levels of vulnerability and marginalization. It is to these communities that airport developers should be especially sensitive as responsible planning has the potential to improve the overall livelihoods situation of these households. Inversely, poor and short-sighted planning reinforces the structures which can lead to the marginalization of low-income households or even undermine their entire livelihoods base. If labour and inputs are sourced locally they can create new employment and income opportunities for local communities. For instance, in the case of catering at Noi Bai, many farmers experienced the airport as positive as it increased demand for their goods and services and subsequently provided them with additional income by providing a new and stable market to sell their goods (on-site catering). However, if development continues as planned many of these same farmers who supported future investment at Noi Bai and were generally positive of the impacts of the airport will lose their land and their homes, taking away the access to the livelihoods assets they rely on for a living.

In summary, the research found that while Noi Bai Airport does contribute to the economic well-being of most households living in close proximity, it simultaneously reduces the availability of some livelihood assets in the area. As a catalyst of modernization, the airport reinforces processes that are driving economic diversification and a transition away from agriculture. In this environment, developers and governments espouse the virtues of sustainable development when it is convenient, but seem to overlook the importance of sustainability in the implementation of infrastructure development, a sector with far reaching consequences for all portions of society. They should therefore be held accountable to their declaration of adherence to the principles of sustainable development. Short-term planning and haphazard or piecemeal approaches to airport development will ultimately reduce the spread of benefits that these types of infrastructure are intended to provide, and undermine sustainable progress in the aviation industry.

9.1. Suggestions for Further Research

First and foremost, alternative models of future airport development at Noi Bai should be explored with the objective of finding solutions that avoid or reduce the widespread displacement of local households in Soc Son District. Based in the spatial analysis conducted in this study, there remain extensive zones to the north of the airport that are unoccupied by residential areas. A feasibility study examining the potential of redirecting the expansion of Noi Bai Airport to the North may uncover options that provide more

sustainable outcomes for local populations. Ultimately, airport expansion is necessary for the continued economic growth and competitiveness of the region. As a consequence, the airport will inevitably infringe on the land used by local communities, and reduce the availability of capitals used to sustain local livelihoods as they exist today. If land required for future expansions is recovered from farmland rather than large residential settlements, the potential negative impacts on the local population can be mitigated to some degree. In summary, potential models of airport development should attempt to nurture the local economy rather than uproot it in order to continue along the strong trajectory of positive developments and poverty alleviation experienced in the region over the past twenty years.

Second, if the current Kansai-based model of expansion is the only viable option to modernize Noi Bai Airport, attention needs to be paid to the local communities subject to land seizure and displacement. Compensation schemes in Viet Nam are often characterized by poor transparency and exhibit a less-than-successful track record when looking at the longer-term outcomes of recipients. Research into the application of more effective support programs, human capacity building, and adequate monetary compensation can help to find more efficient long-term solutions to ease the transition of households and mitigate the negative consequences of relocation. While the primary objective should be to avoid scenarios that involve the displacement of people and entire communities, in some cases spatial constraints and national development goals in rapidly modernizing countries such as Viet Nam may make such measures a necessary evil. More research into the implications of these processes can help reduce the associated negative externalities and find more sustainable solutions for local populations and society as a whole.

Thirdly, while the situation in Soc Son District appears to be highly representative of the challenges facing other areas/regions in Southeast Asia, further research should examine the impacts of other major airports currently in the process of upgrading or expanding in the region. Additional extensive research in this field may help to more clearly identify best practices and innovative solutions that can reduce the footprint of these mega-structures in local communities. The results could then be shared between airport authorities, policy planners, and governments in order to encourage the incorporation of sustainability measures in the operation of airports on a region-wide scale. In the absence of such a uniform system of indicators to assess of sustainability airport-related activities and operation, comparative analysis will not provide the same meaningful insights. The establishment of a universal and commonly-recognized model of sustainability assessment can reward responsible practices while deterring poor performers from continuing along their path of airport development. Such a system implemented by a neutral third party can offer a strong incentive for airports in Southeast Asia to improve all aspects of their operation with regards to sustainable development.

10. REFERENCES

A

AA (2010) *Vietnam's Airports See Traffic Quadruple in Last 10 Years; Few European Airlines Present*. ANNA-AERO. Available: http://www.anna.aero/2010/01/15/vietnams-airports-see-traffic-quadruple-in-last-10-years-few-european-airlines-present/ [21 Sep 2012].

AAFC (2010) *Future Opportunities in Vietnam's Market for Fish and Seafood*. Agriculture and Agri-Food Canada. Available:http://www.ats-sea.agr.gc.ca/ase/5681-eng.htm [30 Sep 2012]

ABS-CBN (2011) *Asian Budget Carriers Spread Wings as Demand Surges*. Agence France-Presse. June 17th, 2011. Available: http://www.abs-cbnnews.com/print/158235 [15 Sep 2012].

ACI (2002) Pacific Day Report. *Dateline*. Vol. 10, No. 3, December 2002. Official Newsletter of the Pacific Region of Airports Council International. ACI Pacific.

ACI (2004) *The Social and Economic Impact of Airports in Europe*. Airports Council International.

ACI (2006) *Airport Development News*. ACI World and Momberger Airport Information Fact Sheet. Available: http://www.aci.aero/aci/aci/file/ADN%20-%20Momberger/ACI-ADN_Dec06.pdf [10 Jan 2013].

ACI (2009) *Aircraft Noise: ACI Position Brief 2009*. Airports Council International.

ACI (2012). *Annual World Airport Traffic Statistics 2011*. Airports Council International.

ACRP (2008) *Airport Economic Impact Methods and Models; A Synthesis of Airport Practice*. Airport Cooperative Research Program (ACRP) *Synthesis 7*. Federal Aviation Administration Transportation Research Board. Washington D.C., USA.

ACRP (2011) *Sustainable Airport Construction Practices*. Airport Cooperative Research Program *Report 42*. Federal Aviation Administration, Transportation Research Board. Washington D.C., USA.

Acuna-Alfaro, J. (2012) *Incentives and Salaries in Vietnam's Public Sector*. Policy Advisor, Public Administration Reform and Anti-Corruption United Nation's Development Programme, Vietnam.

ADB (2002). *Southeast Asia Sub-Regional Report for the World Summit on Sustainable Development*. Asian Development Bank. Available: http://www.rrcap.unep.org/wssd/documents/01%20SEA%20Report.pdf [02 Oct 2012].

ADB (2006). *Vietnam Country Gender Assessment*. Asian Development Bank. Retrieved September 21st, 2012, from http://www.adb.org/sites/default/files/pub/2006/cga-2006-vie.pdf

ADB (2008) *Emerging Asian Regionalism: A partnership for shared prosperity*. Asian Development Bank.

ADB (2012). *Key Indicators for Asia and the Pacific 2012*. Special Chapter: Green Urbanization in Asia. 43 edition. Asian Development Bank. ISBN: 978-92-9092-816-4. Available: http://www.adb.org/sites/default/files/pub/2012/ki2012.pdf [02 Oct 2012].

AFA (2011). *What Are An Airport's Impacts?* Air Force Association. Available: http://www.aef.org.uk/uploads/PlanningGuide2.pdf [01 August 2012].

AI (2007). *Airport Cities & The Aerotropolis: New Planning Models - An Interview with Dr. John D. Kasarda*. Airport Innovation. Global Air Transport Solutions. Available: http://www.aerotropolis.com/files/2007_04_AirportInnovation_NewPLanningModels.pdf [17 Oct 2012].

Airis (2011). *Sustainable Development Solutions for Hanoi Noi Bai International Airport Infrastructure in the Next 50 Years*. Presentation July 7th, 2011. Airis International Holdings.

AL (2012) *Vietnam: Sowing the seeds for future growth*. Airline Leader. Available: www.airlineleader.com/country-in-focus/vietnam-sowing-the-seeds-for-future-growth [16 Sep 2012].

Al Badri, D. (2003) *Kansai Airport: A Beautiful Loser. Kansai International Airport is Stunning - but Sinking into Debt and Desolation*. Available: www.japaninc.com/article.php?articleID=1181 [01 Feb 2013].

Ali, A., Kulemeka, N., Legesse, E. Algindy, A., and Fourati, A. (2011) *Summary of the Environmental and Social Impact Assessment: Sharm el-Sheikh Airport Project*. African Development Bank Group. Project Reference: P-EG-DA0-001.

Alver, J., & Perez, V. (2012) *Vietnam: the Hidden Asian Tiger*. Harvard Political Review. May 23, 2012. Available: http://hpronline.org/world/vietnam-the-hidden-asian-tiger/ [18 Sep 2012].

Andrew, M. and Yali, P. (2012) *The Rise of the Middle Class in Asian Emerging Markets*. KPMG International. April 2012.

Anh, H. (2011a) *Vietnam: Opportunities in the Aviation Sector - 2011*. U.S. Commercial Service, United States of America Department of Commerce. March, 2011. Available: https://www.agentschapnl.nl/sites/default/files/bijlagen/Vietnam%20-%20Aviation%20sector%202011.pdf [02 Nov 2012].

Anh, H. and Triet, H. (2012) *Vietnam Market for Airport Ground Support Equipment, Air Traffic Management Systems, and Aircraft Landing Parts*. U.S. Commercial Service, United States of America Department of Commerce. March, 2012. Available: http://export.gov/vietnam/build/groups/public/@eg_vn/documents/webcontent/eg_vn_051754.pdf [02 Nov 2012].

Anh, V. T. (2011b) *Improve the Situation on Water and Sanitation Health in 5 Communes in Soc Son*. Midterm Review for Wash Project. March 2011. Available:www.ngocentre.org.vn/webfm_send/1833 [20 Aug 2012].

Anh, M. T. P., Ali, M., Anh, H. L., and Ha T.T.T. (2004) *Urban and Peri-urban Agriculture in Hanoi: Opportunities and Constraints for Safe and Sustainable Food Production*. CIRAD - AVRDC. The World Vegetable Center.

AP (2011) *Japan Gives Laos $234m for Airport Expansion*. Airport World. Available: http://www.airport-world.com/home/item/891-japan-gives-laos-$234m-for-airport-expansion [26 Jul 2012].

Arafa, M. H., Osman, T.A., and Abdel-Latif, I.A. (2007) Noise Assessment And Mitigation Schemes For Hurghada Airport. *Applied Acoustics* No. 68, pp. 1373–1385.

Arvis, J., Mustra, M. A., Ojala, L., Shepherd, B., and Saslavsky, D. (2012) *Connecting to Compete 2012: Trade Logistics in the Global Economy*. The Logistics Performance Index and its Indicators. World Bank.

ASEAN (2004) Transport Action Plan 2005-2010. Available http://cil.nus.edu.sg/rp/pdf/2004%20ASEAN%20Transport%20Action%20Plan%202005-2010-pdf.pdf [13 Oct 2012].

ASEAN (2009a) *The Founding of ASEAN*. Available: http://www.aseansec.org/11842.htm [13 Oct 2012].

ASEAN (2009b) A*SEAN Socio-Cultural Community Blueprint*. Available: http://www.aseansec.org/5187-19.pdf [01 Oct 2012].

ASEAN (2011) *ASEAN Tourism Strategic Plan 2011 - 2015*. The Association of South East Asian Nations. Available: http://www.aseansec.org/documents/ATSP%202011-2015.pdf [02 Oct 2012].

ASEAN (2011a) *ASEAN Statistics Leaflet: Selected Key Indicators 2011*. Available: http://www.aseansec.org/publications/ASEAN-Statistics-Leaflet-SKI2011.pdf [01 Oct 2012].

ASEAN (2011b) *ASEAN Strategic Transportation Plan 2011-2015 Final Report*. ERIA Study Team. Available: http://www.eria.org/ASEAN%20Strategic%20Transport%20Plan.pdf [01 Oct 2012].

ASEAN (2012) *Tourist arrivals in ASEAN, by selected partner country/region*. The Association of South East Asian Nations. Availeble: http://www.aseansec.org/stat/Table%2029%20n.pdf [13 Oct 2012].

Ashford, N., Stanton, M., and Moore, C. (1997) *Airport Operations*. McGraw-Hill, New York.

Asinjo, D. A. (2011) Environmental Management at Sustainable Airport Models. *Research Papers*. Paper 257. Southern Illinois University Carbondale.

AT (2010) *Expansion Work Begins at Luang Prabang Airport*. Airport Technology. Available: http://www.airport-technology.com/news/news77246.html [26 Jul 2012].

AT (2011a) *Thai Airports Record Record Passenger Traffic Rise*. Airport Technology. Available: http://www.airport-technology.com/news/newsthailand-airports-report-passenger-traffic-rise-in-2011 [24 Jul 2012].

AT (2011b) *Malaysia's Penang Airport Expansion to be Complete in October*. Airport Technology. Available: http://www.airport-technology.com/news/news121892.html [26 Jul 2012].

AT (2011c) *Malaysia's Penang Airport Expansion to be Complete in October*. Airport Technology. Available: http://www.airport-technology.com/news/news121892.html [26 Jul 2012].

AT (2012) *Noi Bai International Airport*. Airport Technology. Available: www.airport-technology.com/projects/noibai [17 Jan 2013].

AT (2012a) *Soekarno-Hatta Airport to Undergo $1.2bn Expansion*. Airport Technology. Available: http://www.airport-technology.com/news/newssoekarno-hatta-airport-in-indonesia-to-undergo-12bn-expansion/ [21 Jul 2012].

AT (2012b) *Philippines to move ahead with Ninoy Aquino International Airport expansion*. Airport Technology. Available: http://www.airport-technology.com/news/newsphilippines-to-move-ahead-with-ninoy-aquino-international-airport-expansion/ [22 Jul 2012].

AT (N.d.a) *Soekarno Hatta International Airport, Indonesia*. Airport Technology. Available: http://www.airport-technology.com/projects/soekarno-hatta-international-airport/[21 Jul 2012].

AT (N.d.b) *Ngurah Rai International Airport, Indonesia*. Airport Technology. Available: http://www.airport-technology.com/projects/ngurah-rai-airport/ [21 Jul 2012].
AT (N.d.c) *Noi Bai International Airport, Vietnam*. Airport Technology. Available: http://www.airport-technology.com/projects/noibai/ [22 Jul 2012].

AT (N.d.d) *Tan Son Nhat International Airport, Ho Chi Minh City, Vietnam*. Airport Technology. Available: http://www.airport-technology.com/projects/tanson/ [23 Jul 2012].

AT (N.d.e) *Kuala Lumpur International Airport, Malaysia*. Airport Technology. Available: http://www.airport-technology.com/projects/kuala-lumpur-international-airport/ [25 Jul 2012].

AT (N.d.e.) *Pakse International Airport, Laos*. Airport Technology. Available: http://www.airport-technology.com/projects/pakse-international-airport-laos/ [25 Jul 2012].

AT (N.d.f) *Kota Kinabalu International Airport, Malaysia*. Available: http://www.airport-technology.com/projects/kota_kinablu_airport/ [25 Jul 2012].

AT (N.d.f) *Phnom Penh International Airport, Cambodia*. Airport Technology. Available: http://www.airport-technology.com/projects/phnompenhinternation/ [25 Jul 2012].

ATAG (2012a) *Global Aviation Sector Commits to Support Sustainable Development*. Media Release. Mar. 22nd, 2012. Air Transport Action Group.

ATAG (2012b) *Aviation Benefits Beyond Borders - Providing Employment, Trade Links, Tourism and Support For Sustainable Development Through Air Travel*. Air Transport Action Group. Available:http://www.aviationbenefitsbeyondborders.org/sites/default/files/pdfs/ABBB_Medium%20Res.pdf [10 Oct 2012].

Auer, M. R. (2012) Group Forest Certification for Smallholders in Vietnam: An Early Test and Future Prospects. *Human Ecology* No. 40 (2012) pp. 5–14.

AVI (2011) *Passengers Scammed by Airport Taxi Drivers*. AVI Airport Service. Available: http://www.noibaiairporttransfer.com/travel-guide/132/passengers-scammed-by-airport-taxi-drivers.html [11 Nov 2012].

AZ (N.d.a) *Lapu Lapu - Mactan-Cebu International Airport (NOP/RPVM)*. Available: http://www.azworldairports.com/airports/a2300nop.cfm [22 Jul 2012].

AZ (N.d.b.) *Davao - Francisco Bangoy International Airport (DVO/RPMD)*. Available: http://www.azworldairports.com/airports/a2300dvo.cfm [22 Jul 2012].

AZ (N.d.c.) *Kota Kinabalu International Airport (BKI/WBKK)*. Available: http://www.azworldairports.com/airports/a2030bki.cfm [26 Jul 2012].

AZ (N.d.d.) *Penang International Airport (PEN/WMKP)*. Available: http://www.azworldairports.com/airports/a2030pen.cfm [26 Jul 2012].

B

Ba, A. (2010) Regional Security in East Asia: ASEAN's Value Added and Limitations. *Journal of Current Southeast Asian Affairs*. Vol. 29, No. 3, pp 115-130. German Institute of Global and Area Studies.

Barnes, C.M., Ryan, P and Clayton, J.N. (2007) Airport Futures: Towards a Critique of the Aerotropolis Model. *Futures*. Vol. 39, pp. 1009-1028. Elsevier Publishing.

Barrington, D., Dobbs, S., and Loden, D. (2012) Social and Environmental Justice for Communities of the Mekong River. *International Journal of Engineering, Social Justice and Peace*. Vol. 1, No. 1. pp. 31-49. University of Western Australia.

Baulch, B., Chuyen, T. T. K., Haughton, D., & Haughton, J. (2002) *Ethnic Minority Development in Vietnam: A Socioeconomic Perspective*. University of Sussex, UK; National University of Ho Chi Minh City, Vietnam; Suffolk University, USA and Bentley College, USA.

BEDB (2012). *Press Release*. The Brunei Economic Development Board. Available: http://www.bedb.com.bn/news_readmore.php?id=229 [26 Jul 2012].

Berniell, M. (2012) *The Effects of Working Hours on Health Status and Health Behaviours*. March, 2012. CEMFI-UIMP. Available: http://www.iza.org/conference_files/SUMS2012/berniell_m7629.pdf [12 Dec 2012].

BF (2010) The Rise of The Aerotropolis. *Business Facilities*. Vol. 43, No. 8, pp. 2-44. September, 2010.

BiA (2012) *Industrial Parks and Economic Development Zones in North Vietnam*. Business in Asia. Available: http://www.business-in-asia.com/vn_ip_north.htm [20 Nov 2012].

BIE (2012) Vietnam-Laos Newsletter: General Trade and Tourism. November 2012. Brussels Invest & Export. Available: http://www.invest-export.irisnet.be/documents/16349/23201/Vietnam+-+Newsletter+-+November+2012.pdf/93febd14-4ba7-47f6-81fc-d441a6fc2d62?version=1.0 [10 Jan 2013].

Bich, V. B. and Quang, C. T. (1996) *Economic Policy and its Role in Agricultural and Rural Development in Vietnam*. National Political Publishing House, Hanoi, Vietnam.

Bilgi, M. and Cisse, M. (2008) *Environmental and Social Impact Assessment Study Tunisia - Monastir and Enfihda Airports Project*. African Development Fund.

Blanton, W. (2004) On the Airfront - The Airport as an Up-and-Coming Economic Development Catalyst. *Planning*. May 2004; pp. 34-35. American Planning Association.

BLIP (2008) *Noi Bai Industrial Park to Be Expanded*. Binh Long Industrial Park. Available: http://blip.viipip.com/?module=newsdetail&newscode=112# [15 Dec 2012].

Blonigen, B. and Cristea, A. (2012) *Airports and Urban Growth: Evidence from a Quasi-Natural Policy Experiment*. Department of Economics, University of Oregon.

BM (2012). *Hanoi, Vietnam - Sustainable Tourism in Soc Son, Old Quarters, & Cruise and Ha Long Bai*. Bloom Microventures.

BMI (2012) *Vietnam Tourism Report Q2 2012*. Business Monitor International. Available: www.marketresearch.com [25 Nov 2012]/

Boeing (2007) *Current Market Outlook 2008-2007*. Available: http://www.boeing.com/commercial/cmo/pdf/Boeing_Current_Market_Outlook_2011_to_2030.pdf [12 Jan 2013].

Boeing (2012a) *Current Market Outlook 2012-2031*. Available: http://www.boeing.com/commercial/cmo/pdf/CMO_2012_Presentation.pdf [17 Oct 2012].

Boeing (2012b) *World Air Cargo Forecast 2012-2013*. Available: http://www.boeing.com/commercial/cargo/wacf.pdf [17 Oct 2012].
Boopen, S. (2006) Transport Infrastructure and Economic Growth: Evidence from Africa using Dynamic Panel Estimates. *The Empirical Economics Letters*. 5(1). January 2006. School of Public Policy and Management, University of Technology, Mauritius.

Boonsu, W (2012) *Thailand Facing Competition Battle in ASEAN Economic Community*. Pattaya Times. Available http://pattaya-times.com/a7855-thailand-facing-competition-battle-in-asean-economic-community [14 Jam 2013].

Bowen, J. and Cidell, J. (2009) Mega-Airports: The Political, Economic and Environmental Implications of the World's Expanding Air Transportation Gateways. *Engineering Earth*. Ch. 50, pp 867 - 890. Springer Science. Department of Geography Central Washington University, USA.

BP (2012). *Statistical Review of World Energy June 2012*. British Petroleum, London, UK.

BP (2012a) *Suvarnabhumi Finally Scheduled to Get Third Runway*. Bangkok Post Business. Available: http://www.bangkokpost.com/business/aviation/302208/Suvarnabhumi-finally-scheduled-to-get-third-runway [24 Jul 2012].

BP (2012b) *TAA Spreads its Wings to Second Myanmar Destination*. Bangkok Post Business. Available:http://www.bangkokpost.com/business/aviation/305909/taa-spreads-its-wings-to-second-myanmar-destination [24 Jul 2012].

Bradsher, K. (2009) As Labour Costs Soar in China, Manufacturers Look to Vietnam. *New York Times*. June 18, 2008. Available: http://www.nytimes.com/2008/06/18/business/worldbusiness/18invest.html?oref=slogin [12 Jan 2013].

Brekke, K.A., (1997) Hiksian Income from Resource Extraction in an Open Economy. *Land Economics*. Vol.73 No.4, pp. 516–527.

Breu, M., Dobbs, R., Remes, J., Skilling, D., and Kim, S. (2012) Sustaining Vietnam's Growth: the productivity challenge. McKinsey Global Institute. February 2012. Available: http://www.mckinsey.com/insights/mgi/research/asia/sustaining_growth_in_vietnam [12 Jan 2013].

BRGG (2012) Legend Hill Golf Resort. BRG Group. Available: http://www.brggroup.com.vn/Index.aspx?LangID=2&ContentID=10&AspxAutoDetectCookieSupport=1 [7 Jan 2013].

Britton, E., Cooper, A., and Tinsley, D. (2005) *The Economic Catalytic Effect of Air Transport in Europe*. Oxford Economic Forecasting.

Brueckner, J.K. (2003) Airline Traffic and Urban Economic Development. *Urban Studies*. Vol. 40, pp. 1455.

BS (N.d.). *Airport Site*. Bangkok Sawadee. Available: bangkok.sawadee.com/airport/index.html [24 Jul 2012].

BS (2008) *Global Aviation Industry*. Brentford Services. Available: http://www.brentfordservices.com/Aviation.html [09 Jan 2013].

BT (2012). *Bali's Bigger Airport Seen Handling 20 million passengers*. The Bali Times. Available: http://www.thebalitimes.com/2012/06/22/balis-bigger-airport-seen-handling-20-million-passengers/ [21 Jul 2012].

Burdge, R. and Vanclay, F. (1995) *Social Impact Assessment: A contribution to the state of the art series*. Institute of Environmental Studies, University of Illinois. Centre for Rural Social Research, Charles Sturt University.

Button, K. and Lall, S. (1999) The Economics of Being an Airport Hub City. *Research in Transportation Economics*. Vol. 5, pp. 75-105.

Button, K. and Taylor, S. (2000) International Air transportation and Economic development. *Journal of Air Transport Management* Vol. 6 (2000) pp. 209-222. School of Public Policy, George Mason University.

Bui, T. K. (2011) *Viet Nam Air Spotters*. Available: http://jetphotos.net/viewphoto.php?id=7151374 [25 Jan 2013].

BW (2011) *Report: Vietnam's Manufacturing Industry*. Business Wire. Available: http://www.pcb007.com/pages/zone.cgi?a=74480 [19 Jan 2013].

C

CA (2008) *Airport Profile: Phnom Penh*. Cambodia Airports. Available: www.cambodia-airports.com/index.php?option=com_content&view=article&id=16&Itemid=23&lang=en [21 Jul 2012].

CAAV (2012) *Establishment of a New Airports Corporation in Vietnam*. Ministry of Transport, Civil Aviation Authority of Vietnam. Available: http://www.caa.gov.vn/eDefault.aspx?tabid=8&catid=506&articleid=8569 [19 Sep 2012].

Caballero-Anthony, M. (2006). *Bridging Development Gaps in Southeast Asia: Towards an ASEAN Community*. UNISCI Discussion Papers.

CAS (N.d.). *Facts & Figures*. Changi Airport Singapore. Available: http://www.changiairport.com/our-business/about-changi-airport/facts-statistics [26 Jul 2012].

CDA (2011) *Sustainable Airport Manual v2.1*. Chicago Department of Aviation. City of Chicago.

CDM Smith (2012) *The Economic Impact of Commercial Airports in 2010*. Prepared for Airports Council International – North America.

Cech, P. (2004) *The Catalytic Effect of the Accessibility to Air Cargo Services*. The TIACA Graduate Research Paper Competition 2004.

CERDA & CSDM (2012) *The Ethnic Minorities in REDD+ Implementation: the Case of Vietnam*. Center of Research and Development in Upland Areas & Center for Sustainable Development in Mountainous Areas.

Chi, N. (2001) *A Strategy for the Vietnam Civil Aviation Administration To Promote US-Vietnam Bilateral Civil Aviation Agreement*. Monterey Institute of International Studies. December 2001.

Chok, S., and Macbeth, A. (2007) Tourism as a Tool for Poverty Alleviation: A critical analysis of pro-poor tourism and implications for sustainability. *Pro-Poor Tourism: Who Benefits? Perspectives on Tourism and Poverty Reduction*. Edited by Hall, C. pp 34-41.

Chrisman, C., Fehrenbacher, J., Kozak, B., LaRowe, R., and Winter, S. (2011). *Establishing a Definition and Framework for Sustainability in Aviation*. College of Aviation Technology, Purdue University.

CI (2009) *Prosperous Metropolis: Competitiveness Strategy for the Helsinki Metropolitan Area*. European Union European Regional Development Fund. Culminatum Innovation.

CIA (2012) *The World Factbook: Vietnam*. Central Intelligence Agency. Available: https://www.cia.gov/library/publications/the-world-factbook/geos/vm.html [18 Sep 2012].

CMAG (N.d.). Chiang Mai Airport Guide (CNX). Chiang Mai Airport Guide. Available: www.chiangmaiairportonline.com [25 Jul 2012].

Cobb, C. and Beloff, B. (2011) *Benchmarking Sustainability*. Institute for Sustainability, AIChe Technological Community, and Golder Associates.

Cockerham, G. (2010) Regional Integration in ASEAN: Institutional Design and the ASEAN Way. *East Asia* Vol. 27. pp. 165-185.

Contreras, J., Tristao, I., and Panday, S. (2011) *An Exploration into the Determinants of Cyclical Unemployment*. Congressional Budget Office. Interamerican Development Bank and Brandeis University.

CR (2009) *Global Winners & Reporting Trends March 2008*. Corporate Register Reporting Awards. Corporate Register Limited. Available: http://www.corporateregister.com/pdf/CRRA08.pdf [15 July 2012].

Cristureanu, C. and Bobirca, A. (2007) Airports Driving Economic and Tourism Development. *The Romanian Economic Journal*. Year X, no. 25.
Cruz, C. and Marques, R. (2011) Contribution to the Study of PPP Arrangements in Airport Development, Management and Operation. *Transport Policy*. Vol. 18 (2011) pp. 392-400. Department of Civil Engineering and Architecture, Technical University of Lisbon.

CWV (2011) *Soc Son Investors Withdrawing from the Deflating Bubble*. Coldwell Banker Vietnam. Available: http://www.coldwellbankervn.com/new.php?catid=27&n=35 [15 Jan 2013].

D

Dae-Bong, K. (2009) *Human Capital and its Measurement*. Presentation at The 3rd OECD World Forum on "Statistics, Knowledge, and Policy". Charting Progress, Building Visions, Improving Life. Busan, Korea 27-30th Oct. 2009.

Dalton, R. and Ong, N. (2004) *Civil Society and Social Capital in Vietnam*. Modernization and Social Change in Vietnam. Munich Institute for Social Science.

Dalton, R., Pham M. H., Pham T.N., and Nhu-Ngoc O. (2002). Social Relations and Social Capital in Vietnam. The 2001 World Values Survey.

Damuri, Y. R., and Anas, T. (2005) *Strategic Directions for ASEAN Airlines in a Globalizing World: The Emergence of Low Cost Carriers in South East Asia*. Final Report REPSF Project no. 04/008. The Government of Australia.

Denslow, N. (2012) *Vietnam's Airports Welcome Foreign Investors for Upgrades*. Bloomberg News. March 10th, 2012. Available: http://www.bloomberg.com/news/2012-03-10/vietnam-s-airports-welcome-foreign-investors-for-upgrades.html [19 Sept 2012].

De Neufville, R. and Odoni, A. (2003) *Airport Systems: Planning, Design and Management*. McGraw-Hill, New York.

de Wit, J. (2007) *Decentralization, Local Governance and Community Participation in Vietnam*. VASS-ISS project. Institute of Social Studies, The Hague, The Netherlands.

Derewicz, M. (2011) Welcome to the Age of the Aerotropolis. *Endeavors*. Spring 2011; pp. 25-29. University of North Carolina at Chapel Hill.

DFID (1999) *Sustainable Development Framework: Sustainable Livelihoods Guidance Sheets*. Department for International Development. United Kingdom.

Diaz, P (2008) *Check-in process at Lisbon Airport: Event-based simulations and collaborative design*. Universidad Politecnica de Madrid (UPM). Instituo Superior Tecnico Universidad Tecnica de Lisboa.

DiGregorio, M. (2011) Into the Land Rush: facing the urban transition in Hanoi's western suburbs. *International Development Planning Review*. Vol.33, No.3, pp. 294-319.

DNAG (2011). *Da Nang Airport Quick Facts*. Da Nang Airport Guide. Available: http://www.danangairportonline.com/da-nang-airport-quick-facts [23 Jul 2012].

Dong, N. L. (2011) *Jetro Plans expanded Hanoi Airport*. Intellasia. Available: www.intellasia.net/jetro-plans-expanded-hanoi-airport-5398 [21 Jan 2012].

Duenwald, K. (2008). *Kansai International Airport in Japan*. Eurasian Aviation. Available: www.eurasianaviation.files.wordpress.com/2010/11/kansai-airport2.doc [18 Jan 2012].

E

EFA (2011). *European Economic Forecast - Autumn 2011*. European Economy 6. Economic and Financial Affairs Directorate-General of the European Commission.

EIA (2012). *Passenger Statistics For October 2012*. Edmonton International Airport. Available: http://corporate.flyeia.com/media_resources/facts_statistics/passenger_statistics.aspx [14 Dec 2012].

EIA (2012). *Vietnam Energy Data, Statistics and Analysis - Oil, Gas, Electricity*. U.S. Energy Information Administration. Available: http://www.eia.gov/cabs/Vietnam/pdf.pdf [19 Sep 2012].

Elliott, L. (2012). ASEAN and Environmental Governance: Strategies of Regionalism in Southeast Asia. *Global Environmental Politics* Vol 12, No 3. August 2012.

Emerson, C. and Leahy J. (2010) *Airbus Global Market Forecast 2010-2029*. Airbus. Presentation Toulouse, Dec. 13th, 2010.

EPA (2009) *Developing and Implementing an Airport Recycling Program*. United States Environmental Protection Agency. Available: http://www.epa.gov/wastes/conserve/tools/rogo/documents/airport-recycling-guide.pdf [05 Oct 2012].

Epprecht, M., Muller, D., & Minot, N., (2011) How Remote are Vietnam's Ethnic Minorities? An analysis of spatial patterns of poverty and inequality. *The Annals of Regional Science* Vol. 46, pp. 349-368.

ERIA (2010) ASEAN Strategic Transport Plan 2011-2015: Executive Summary. ERIA Study Team. Available: http://www.eria.org/ASEAN%20Strategic%20Transport%20Plan.pdf [03 Jan 2013].

Evans, K. and Rorris, A. (2010) Optimising the Impact of Vietnam's Higher Education Sector on Socio-Economic Development. In G.Harman et al. (2010) *Reforming Higher Education in Vietnam*. pp 167-181. Department of Education and Training, Sydney, NSW, Australia.

F

FAA (1990). Community Involvement Manual. US Department of Transportation. Federal Aviation Administration. Available: http://www.faa.gov/about/office_org/headquarters_offices/apl/noise_emissions/planning_toolkit/media/VI.A.pdf [19 Sep 2012].

Fan, S., Houng, P. L., & Long, T. Q. (2004). Government Spending and Poverty Reduction in Vietnam. World Bank Report. International Food Policy Research Institute, Washington DC and Central Institute for Economic Management, Hanoi.

FAO (2009) *Training and Employment Opportunities to Address Poverty Among Rural Youth: A synthesis report*. Joint Study by FAO, ILO and UNESCO. Asia and Pacific Regional Bureau for Education. Bangkok, Thailand.

FAO (2012). *Vietnam Forestry Outlook Study*. Forest Science Institute of Vietnam (FSIV). Working Paper No. APFSOS II/WP/2009/09.

Folkmanis, J (2011) *Vietnam Communists Hold Election for National Assembly Involving One Party*. Bloomberg News. May 22, 2011.Available: http://www.bloomberg.com/news/2011-05-22/vietnam-communists-hold-election-for-national-assembly-involving-one-party.html [18 Sep 2012].

Forbes (2008). *Best Countries for Business: #113 Vietnam*. Forbes Investment. Available: http://www.forbes.com/lists/2008/6/biz_bizcountries08_Vietnam_CHI126.html [18 Sep 2012].

FOTE (2005). Environmental Impact Assessment (EIA) - a campaigner's guide. Friends of the Earth. Available: http://www.foe.co.uk/resource/guides/strategic_env_assessment.pdf [22 Sep 2012].

Freestone, R. (2009) Planning, Sustainability and Airport-Led Urban Development. *International Planning Studies*. Vol. 14, No. 2: pp 161-176, May 2009. Routledge.

Freestone, R. and Baker, D. (2011) Spatial Planning Models of Airport-Driven Urban Development. *Journal of Planning Literature*. Vol. 26, No. 3: pp 263-279. June, 2011. Sage Publishing.

Fritzen, S. (2000) *Institutionalizing Participation: Lessons Learnt and Implications for Strengthening Viet Nam's National Programs*. UNDP, UNCDF, CIDA, National University of Singapore. Hanoi, Vietnam.

G

Garmendia, E., Prellezo, R., Murillas, A., Escapa, M. and Gallastegui, M. (2010) Weak and Strong Sustainability Assessment in Fisheries. *Ecological Economics*. Vol. 70 (2010), pp. 96-106.

GE (2012) *Global Insights - Vietnam*. Global Edge (GE) - Broad College of Business, Michigan State University. Available: *http://globaledge.msu.edu/countries/vietnam/economy* [06 Jan 2013].

Gillen, D. (2009) *The Future for Interurban Passenger Transport: International Air Transport in the Future*. International Transport Research Symposium. Discussion Paper No. 2009-15.

Goebel, T. and Derks-Wood, C. (2010) Sustainability Reporting in the Information Age. *Airport Magazine*. August/September, 2010.

GPG (2012) *Noi Bai Free Trade Zone*. Global Property Guide. Available: http://www.globalpropertyguide.com/where-to-buy-property-Soc-Son-1585 [15 Nov 2012].

Graziano, D. (2012) *Nokia Breaks Ground on New Manufacturing Facility in Vietnam*. April 23rd, 2012. Available: http://bgr.com/2012/04/23/nokia-breaks-ground-on-new-manufacturing-facility-in-vietnam/ [12 Jan 2013].

GRI (2009) *A Snapshot of Sustainability Reporting In the Airports Sector*. Global Reporting Initiative, 2009. Available:https://www.globalreporting.org/resourcelibrary/A-Snapshot-of-sustainability-reporting-in-the-Airports-Sector.pdf [12 Sep 2012].

GSO (2004). *Vietnam Migration Survey 2004*. General Statistics Office of Vietnam.

Guan, B. (2004) ASEAN's Regional Integration Challenge: The ASEAN Process. *The Copenhagen Journal of Asian Studies* Vol. 20, pp. 70-94.

H

Haggett, P. (1979) *Geography: A Modern Synthesis*. Harper and Row, New York.

Halpern, N. and Brathen, S. (2010) *The Catalytic Impact of Airports in Norway*. Report 1008. ISBN: 978-82-7830-150-0.

Han, S. S. and Vu, K.T. (2008) Land Acquisition in Transitional Hanoi, Vietnam. *Urban Studies* Vol. 45 No. 5, pp. 1097-1117. May 2008. Sage Publishing.

Hanh, D. H., and Dong, N. T. (2011) *The Current State of River Basin in Vietnam: Pollution and Solution*. Institute of Environmental Technology and Ministry of Natural Resources and Environment, Vietnam.

Harman, G., Hayden, M., and Nghi, P. (2010) Higher Education in Vietnam: Reform, Challenges and Priorities. *Reforming Higher Education in Vietnam*. Centre for Higher Education Management and Policy, University of New England, Australia.

Haukioja, T. (2007) *Sustainable Development and Economic Growth in the Market Economy*. Publications of the Turku School of Economics. Esa Print Tampere. Available: http://info.tse.fi/julkaisut/vk/Ae6_2007.pdf [15 Dec 2012].

Herdman, A. (2011) *Future Growth of the Airline Industry: How will global competition drive change?* Association of Asia Pacific Airlines. Feb. 22nd New Geneva Forum 2011.

HJAIA (2005). *Connecting the Region to the World*. Financial Technical Report. Economic Impact Study. Hartsfield-Jackson Atlanta International Airport. Available: http://www.atlanta-airport.com/docs/NewsRoom/2009_Economic_Impact_Study_report.pdf [18 Dec 2012].

HMH (2012) *Travel Distance between Airports, Cities and Countries*. How Many Hours. Available : http://www.howmanyhours.com/fly.php [05 Jan 2013].

Hoi, P.V. (2012). *Interview with Pham Van Hoi*. June 15th, 2012, researcher at Hanoi Agricultural University (HAU).

Ho, N. P. (N.d) Entrepreneurship in Vietnam: Just on the Starting Point of the Race. Faculty of Economic Development at University of Economics in Ho Chi Minh City. Available: http://www.mansfieldfdn.org/backup/programs/program_pdfs/ent_vietnam.pdf [10 Jan 2013].

Hoa, N. (2012) Hanoi Considering Building Disneyland in Soc Son. ANT Consultants. Available: http://www.antconsult.vn/news/hanoi-considering-building-disneyland-in-soc-son.html [13 Jan 2013].

Honey, M. and Gilpin, R. (2009) *Tourism in the Developing World: Promoting Peace and Reducing Poverty*. Special Report. United States Institute of Peace. Washington D.C.

Horonjeff, R. and McKelvey, F. (1994) *Planning and Design of Airports*. fourth ed. McGraw-Hill, New York.

HT (2008). Noi Bai Industrial Zone. *Hanoi Times*. Available: http://hanoitimes.com.vn/print.asp?newsid=8257 [15 Dec 2012].

Hung, L. (2010a). ASEAN Charter: Deeper Regional Integration under International Law. *Chinese Journal of International Law* 2010, pp. 821-837. Oxford University Press.

Hung, N. (2010b) *Urban Air Quality Modelling and Management in Hanoi, Vietnam*. National Environmental Research Institute. Danish International Development Agency. Aarhus University, Denmark.

Huu, T. (2012). *Hanoi Accelerates Land Clearance for Key Transport Projects*. Nhandan Online. Available:http://en.nhandan.org.vn/cmlink/nhandan-online/homepage/society/current/hanoi-accelerates-land-clearance-for-key-transport-projects-1.351914 [01 Feb 2012].

I

IA (2011) *Vietnam's Airline Industry to Reach Third Fastest-growth in World, IATA Chief Says*. Intellasia. Available: http://www.intellasia.net/vietnams-airline-industry-to-reach-third-fastest-growth-rate-in-world-iata-chief-says-146280 [12 Jan 2013].

IA (2012) *Average income of the Vietnamese remain low compared with Asean*. Intellasia. Available:http://www.intellasia.net/average-income-of-the-vietnamese-remain-low-compared-with-asean-192385 [12 Dec 2012].

IATA (2011) *Aviation Opportunities For Vietnam*. International Air Transport Association. Available: http://www.iata.org/pressroom/pr/pages/2011-01-14-01.aspx [08 Oct 2012].

ICAO (1999) *Aerodrome Standards: Aerodrome Design and Operations*. Cooperative Development of Operational Safety and Continuing Airworthiness. International Civil Aviation Organization. ICAO Annex 14, Third Edition, July, 1999. Available: http://legacy.icao.int/fsix/_Library%5CManual%20Aerodrome%20Stds.pdf [28 Jan 2013].

ICAO (2001) *Aviation and Sustainable Development*. Background Paper No. 9. International Civil Aviation Organization. Available: http://www.un.org/esa/sustdev/csd/csd9_bp9.pdf [11 Oct 2001].

ICAO (2011a) *Aviation & Sustainability - Determining the complex environmental, economic and social impacts that are defining aviation's future*. Special State Profile Feature: Poland. International Civil Aviation Organization. Vol. 66, No. 6. Available: http://www.icao.int/publications/journalsreports/201 1/6606_en.pdf [15 Oct 2012].

ICAO (2011b) *State of Global Aviation Safety*. International Civil Aviation Organization. Available: http://www.icao.int/safety/Documents/ICAO_State-of-Global-Safety_web_EN.pdf [14 Oct 2012].

ICAO (2012) *Global Aviation and Our Sustainable Future*. International Civil Aviation Organization Briefing for RIO+20. Available:http://www.icao.int/environmental-protection/Documents/RIO+20_booklet.pdf [12 Oct 2012].

ICE (2011) An Overview on the Logistics Market in Vietnam. Italian Institute for Foreign Trade (ICE). January, 2011. Available: http://www.ice.gov.it/paesi/asia/vietnam/upload/198/110321%20logistics%20in%20Vietnam.pdf [20 July 2012].

ICEM (2003) *Vietnam: National Report on Protected Areas and Development*. Ministry of Agriculture and Rural Development, Ministry of Fisheries and Ministry of Natural Resources and Environment for International Centre for Environmental Management.

IPCC (1999) *Aviation and the Global Atmosphere: Summary for Policy Makers*. Intergovernmental Panel for Climate Change: Geneva. Available: http://www.ipcc.ch/ipccreports/sres/aviation/index.php?idp=3 [12 Oct 2012].

IPCC (2007). *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Cambridge University Press. Available: http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_wg2_report_impacts_adaptation_and_vulnerability.htm [02 Oct 2012].

IV (2005). *Edmonton City Centre Airport Economic Impact Study - Summary Report*. InterVISTAS Consulting Inc. Strategic Transportation & Tourism Solutions. Available: http://corporate.flyeia.com/media/7613/270.pdf [26 Oct 2012].

IV (2009) *The Impact of International Air Service Liberalisation on Vietnam*. Agenda for Freedom. InterVISTAS-EU Consulting Inc. July, 2009. Available: http://www.iata.org/SiteCollectionDocuments/Documents/VietnamReport.pdf [20 Sep 2012].

Ives, D. (2000) Viet Nam: Public Sector Management. *Working Paper 2* Prepared for AusAID. Available: http://www.ausaid.gov.au/publications/Documents/vietnam_wp2.pdf [14 Dec 2012].

IWS (2012) *Vietnam Internet Usage Statistics and Telecommunications*. Internet World Statistics. Available: http://www.internetworldstats.com/asia/vn.htm [04 Jan 2013].

J

JG (2012). *Medan's New International Airport Set To Be Up and Running Early Next Year*. Jakarta Globe. Available: http://www.thejakartaglobe.com/business/medans-new-international-airport-set-to-be-up-and-running-early-next-year/494922 [21 July 2012].

JICA (2012) *Construction of Noi Bai International Airport's Terminal 2 Kicked off*. Press Release, Japan International Cooperation Agency. Available: www.jica.go.jp/vietnam/english/office/topics/.../press111204_EN.pdf [15 Jan 2013].

Johnson, J. and Lipscomb, J. (2006) Long Working Hours, Occupational Health and the Changing Nature of Work Organization. *American Journal of Industrial Medicine*. Vol. 49, pp. 921-929.

Jones, A. (2012). *BA airport jobs threatened*. The Independent. Available: http://www.independent.co.uk/news/business/news/ba-airport-jobs-threatened-7637052.html [15 Jan 2013].

Jones, D. and Smith, M. (2007) Making Process Not Progress: ASEAN and the Evolving East Asian Regional Order. *International Security*. Vol. 32, No. 1. pp. 148-184.

JP (2011a) *IATA sees strong growth in Indonesia*. The Jakarta Post. Available: http://www.thejakartapost.com/news/2011/09/23/iata-sees-strong-growth-indonesia.html [21 July 2012].

JP (2011b) *Bali set to expand airport amid traffic overload*. The Jakarta Post. Available: http://www.thejakartapost.com/news/2011/05/16/bali-set-expand-airport-amid-traffic-overload.html [21 July 2012].

JT (2012) *Kansai Airport Logs JPY11.2 Billion Loss*. The Japan Times. Kyodo. Available: www.japantimes.co.jp/news/2012/11/16/business/kansai-airport-logs-11-2-billion-loss/#.UQoD7qX7KSo [02 Feb 2013].

K

Karim, M. R., Parikesit, D., Narupiti, S., and Kushari, B. (2003) Airport Development in Southeast Asia - Case Study of Malaysia and Thailand. *Journal of the Eastern Asia Society for Transportation Studies*, Vol. 5, October, 2003.

KAS (2010) Participation and Governance in Vietnam. Assessment Report: People's Participation and Local Governance, Challenges and Opportunities for Municipalities. Konrad-Adenauer-Stiftung (KAS). Association of Cities of Vietnam (ACVN). European Union.

Kasarda J.D. (2008) Green Aerotropolis. *Global Airport Cities*. Issue 2, Volume 3.

Kasarda, J. (2010) *Global Airport Cities*. Frank Hawkins Kenan Institute of Private Entreprise, University of North Carolina. Airports Council International. Insight Media 2010.

Kasarda, J.D. (2006) The Rise of the Aerotropolis. *Transportation*. Issue 10.

Kasarda, J.D. (2011) The Aerotropolis and Global Competitiveness. *Diplomatic Courier*. pp. 17-19. December 2011.

Kasarda, J.D. (2012) *About the Aerotropolis*. Available: http://www.aerotropolis.com/airportCities/about-the-aerotropolis [01 Nov 2012].

Kasarda, J.D.; Appold, S.J., and Mori, M. (2006) *The Impact of the Air Cargo Industry on the Global Economy*. The Center of Air Commerce.

Kaszewski, A. and Sheate, W. (2004) Enhancing the Sustainability of Airport Developments. *Sustainable Development*. Vol. 12, pp. 183-199. Imperial College London, United Kingdom.

Keeley, B (2007) *Human Capital: how what you know shapes your life*. OECD Insights. Organisation for Economic Co-operation and Development.

KIAT (1998). Development Phases of KIAT. Available: http://www.kiat.net/klia/phases.html [22 Jul 2012].

Knippenberger, U. and Wall, A. (2009) *Airports in Cities and Regions. Research and Practise*. KIT Scientific Publishing. 2010.

Kolmair, B. and Gamper, D. (2002) *The Sustainable Livelihoods Approach*. Input Paper for the Integrated Training Course of NCCR North- South Aeschiried, Switzerland 9th -20th September, 2002.

KPMG (2011). *International Survey of Corporate Responsibility Reporting 2011*. KPMG International Cooperative. KPMG Consulting. April, 2012. Available: http://www.kpmg.com/global/en/issuesandinsights/articlespublications/corporate-responsibility/pages/2011-survey.aspx [15 Nov 2012].

Krul, J. (2011) *Success factors for the Airport City: The Schipol Case*. Presentation February 8, 2011 Brisbane, Australia. Schipol Group. Available: http://www.airportmetropolis.qut.edu.au/news /documents/JoopKrul.pdf [12 Nov 2012].

Kutcher, S. (2011) *Hanoi Today - A Daily Photo of Life in the Vietnam Capital*. Available: http://www.hanoi-today.com/2011_04_01_archive.html [12 Jan 2013].

L

Labbe, D. (2010) *Facing the urban Transition in Hanoi: Recent Urban Planning Issues and Initiatives*. Institut National de la Recherche Scientifique. Centre - Urbanisation Culture Societe. Montreal, Canada.

Lakshmanan, T.R. (2011) The broader economic consequences of transport infrastructure investments. *Journal of Transport Geography*. Vol 19 (2011), pp. 1–12.

Lee, B., Binns, T. and Alan, D.B. (2010) *The Dynamics of Urban Agriculture in Hanoi, Vietnam*. Field Actions Science Reports. Special Issue 1 Urban Agriculture.

Lee, H., Plummer, M. (2011) *Assessing the Impact of the ASEAN Economic Community*. Osaka School of International Public Policy Discussion Paper. OECD. Available: http://ideas.repec.org/p/ osp/wpaper/11e002.html [10 Sep 2012].

Lee, J. J., Lukachko, S. P., Waitz, I. A., and Schafer, A. (2001) Historical and Future Trends in Aircraft Performance, Cost and Emissions. *Annual Review of Energy and the Environment* Vol. 26, pp. 167-200, 2001. Massachusetts Institute of Technology.

Lee, S., McCann, D., and Messenger, J. (2007) *Working Time Around the World: Trends in working hours, laws and policies in a global comparative perspective*. Routledge Studies in the Modern World Economy. International Labour Office, Geneva, Switzerland.

Leigh, S. (2012) *Sea-Tac Airport Workers Authorize a Strike*. Available: http://socialistworker.org/print/2012/10/10/sea-tac-workers-authorize-strike [15 Jan 2013].

LH (2012) *Balance - Key Data On Sustainability Within the Lufthansa Group*. Lufthansa Group. Available: http://verantwortung.lufthansa.com/fileadmin/downloads/en/LH-

sustainability-report-2012.pdf [15 Oct 2012].

Li, K.M. (N.d.) *Aircraft Noise and Emissions Mitigation*. Available: http://www.rduaircraftnoise.com /noiseinfo/downloads/AircraftNoiseandEmissionsMitigation.pdf [21 Oct 2012].

Lijesen, M., Straaten, W.v.d., Dekkers, J., Elk, R.v., Blokdijk, J. (2010) How Much Noise Reduction At Airports? Transportation Research Part D: *Transport and Environment* Vol. 15 (1), pp. 51-59.

Lindborg, J., Thomas, F., and Francoz, E. (2012) *Assessment of Public-Private Partnerships in Viet Nam: Constraints and Opportunities*. Asian Development Bank (ADB) and Agence Francais de Development (AFD).

Longhurst, J., Gibbs, D., Raper, D. W., and Conlan, D. E. (1996) *Towards Sustainable Airport Development*. The Environmentalist Vol. 16, pp 197-202. Department of Environmental Health and Sciences at University of the West of England.

LOTC (N.d.) *Perishable Cargo*. LOT Polish Airlines. Availabe: http://www.lot.com/pl/en/web/lotcargo/perishable-cargo [21 Dec 2012]

Lurie, C. and Townsend, S. (2007) *How Do Airports Stack Up? Measuring Environmental Performance*. Airport Consulting. Winter 2007/2008. Available: http://www.vhb.com/ SiteObjects/published//4FCC5B454FF7253000FE9B66206DA365/4C679DE3A86C551BD0D1EB9CE 821C2DD/file/BenchmarkingPaper_ACC.pdf [10 Nov 2012].

Luther, L. (2007). *Environmental Impacts of Airport Operations, Maintenance, and Expansion*. CRS Report for Commerce. Available: http://www.fas.org/sgp/crs/misc/RL33949.pdf [10 Nov 2012].

Luu, L., Bui, T., and Nguyen, T. (2008) *The Current State on Water Quality, Eutrophication and Biodiversity of West Lake (Hanoi, Vietnam)*. Hanoi University of Sciences. Ministry of Planning and Investment.

Lydenburg, S., Rogers, J., and Wood, D. (2010) *From Transparency to Performance; Industry-Based Sustainability Reporting on Key Issues*. The Hauser Center for Nonprofit Organizations at Harvard University. Initiative for Responsible Investment.

Lydersen, K. (2012) *Can Airports Be Green? With Solar Farm, Chicago argues they can*. Midwest Energy News. Sept. 13th, 2012. Available: http://www.midwestenergynews.com/2012/09/ 13/can-airports-be-green-with-solar-farm-chicago-argues-they-can/ [13 Nov 2012].

M

MARD (2003). *Vietnam - National Report on Protected Areas and Development*. Ministry of Agriculture and Rural Development. Available: http://www.mekong-protected-areas.org /vietnam/docs/vietnam-pad.pdf [21 Sep 2012].

Markussen, T., Tarp, F., Do, H.T., and Nguyen, D. A. T. (2006). *Inter- and Intra-Farm Land Fragmentation in Vietnam*. Available: http://www.ciem.org.vn/home/en/upload/info/ attach/13388684249060_InDepthStudyLandFragmentation.pdf [08 Jan 2013].

Martinez-Alier, J., Munda, G., O'Neill, J., (1998). Weak comparability of values as a foundation for ecological economics. *Ecological Economics* Vol. 26, pp. 277–286.

MB (2012) *Singapore's Changi Airport Hikes Passenger Service Fee Starting April 1*. Manila Bulletin Publishing Corporation. Available:http://www.mb.com.ph/articles/368431/singapore-s-changi-airport-hikes-passenger-service-fee-starting-april-1#.UKkiRIbZ3Ow [26 Jul 2012].

MBN (2012) *Thai Air Asia to launch Mandalay-Bangkok direct flight*. Myanmar Business Network. Available http://www.myanmar-business.org/2012/08/thai-air-asia-to-launch-mandalay.html [25 Jul 2012].

MCIAA (2011a) *Current Operations*. Mactan-Cebu International Airport Authority. Available: http://www.mciaa.gov.ph/Current%20Operations.html [22 Jul 2012].

MCIAA (2011b) Planning for the Future. Mactan-Cebu International Airport Authority. Available: http://www.mciaa.gov.ph/Planning%20for%20the%20Future.html [22 Jul 2012].

MCIAA (2012) *G-1 Comparative Traffic Statistics*. Mactan-Cebu International Airport Authority. Available: http://www.mciaa.gov.ph/Images/Statistics/Comparative%20Traffic%20Statistics_pop.html [22 Jul 2012].

McPherson, M. (2012) Land Policy in Vietnam: Challenges and Prospects for Constructive Change. *Journal of Macromarketing*. Vol. 32(1). pp. 137-146.

ME (2005) *Community Participation in Rural Transport: Contribution and Participation Issues in Vietnam*. South East Asian Commune Access Programme SEACAP 15. Mekong Economics. Hanoi, Vietnam. Available: http://www4.worldbank.org/afr/ssatp/Resources/HTML/Gender-RG/Source%20%20documents/Technical%20Reports/Rural%20Access%20and%20Mobility/TERAM4%20Rural%20Participation%20in%20Transport%20Vietnam.pdf [11 Nov 2012].

MGI (2011) *Internet Matters: The Net's sweeping impact on growth, jobs, and prosperity*. The McKinsey Global Institute. McKinsey & Company. Available:http://www.mckinsey.com/insights/mgi/research /technology_and_innovation/internet_matters [15 Jan 2012].

MIAA (N.d.) *About Ninoy Aquino International Airport Terminal 2*. Manila International Airport Authority. Retrieved July 22nd, 2012, from http://125.60.203.88/miaa/index.php?option=com_content&view=category&layout=blog&id=22&Itemid=22 [22 Jul 2012].

Mikic, M. (2009) *ASEAN and Trade Integration. Trade and Investment Division*. Staff Working Paper 01/09. United Nations Economic and Social Commission for Asia and the Pacific. Available: http://www.unescap.org/tid/publication/swp109.pdf [12 Sept 2012].

Minh, C. and Winters P. (2011). The Impact of Migration on Food Consumption Patterns: The Case of Vietnam. *Food Policy*. Vol. 36: pp. 71-87.

Minh, H. B. and Raybould, A. (2011) *Vietnam Airlines to Expand Fleet to 110 Aircraft by 2015*. Reuters News. Retrieved on Sept. 21, 2012, from: http://www.reuters.com/assets/print?aid=USL3E7I10DA20110701 [21 Sep 2012].

Minot, N., Baulch, B., and Epprecht, M. (2003) *Poverty and Inequality in Vietnam: spatial patterns and geographic determinants*. Inter-Ministerial Poverty Mapping Task Force. International Food Policy Research Institute and Institute of Development Studies, University of Sussex.

Mizra, H., and Giroud, A. (2003) *Regionalisation, Foreign Direct Investment and Poverty Reduction: The Case of ASEAN*. Experts' meeting on Foreign Direct Investment in Developing Asia. Asian Development Bank & OECD Development Centre.

Mocan, H.N. (1999) Structural Unemployment, Cyclical Unemployment, and Income Inequality. *The Review of Economics and Statistics*, February 1999. Vol. 81(1): pp. 122–134.

MoFA (2012) Political System of Vietnam. Ministry of Foreign Affairs Socialist Republic of Vietnam. Available: http://www.mofa.gov.vn/en/tt_vietnam/nr040810155159/ [18 Sep 2012].

Montalvo, J. G. (1998) A Methodological Proposal to Analyze the Economic Impacts of Airports. Universitat de Valencia. Available: http://www.econ.upf.edu/~Montalvo/wp/ijte_98.pdf [04 April 2012].

MPI (2010) *Millenium Development Goals 2010 National Report: Vietnam ⅔ of the way achieving the Millennium Development Goals and Towards, 2015*. Ministry of Planning and Investment Report. Socialist Republic of Vietnam.

MPI (2011) *Population Change and Family Planning Survey: Major Findings*. January 4th, 2011. Ministry of Planning and Investment General Statistics Office, Hanoi, Vietnam.

MT (2011) *Government reveals plan to expand Yangon International Airport*. Myanmar Times. Available: www.mmtimes.com/2011/news/580/news58012.html [22 Jul 2012].

MT (2011) *New Airport for capital: state media*. Myanmar Times. Available: http://www.mmtimes.com/no469/b006.htm [25 Jul 2012].

Muessel, C. and Lowe, C. (2009) *Infrastructure Development in Vietnam*. Watson, Farley, & Williams. Singapore.

MVV (N.d.) *Tan Son Nhat International Airport (SGN)*. My Vietnam Visa. Available: http://www.myvietnamvisa.com/news/tan-son-nhat-international-airport-sgn.html [23 Jul 2012].

N

NA (2004) *Law on Land*. National Assembly. Socialist Republic of Vietnam. Subscription 54 (4/2003) No. 13-2003-QH11. Ministry of Planning and Investment. Allen Arthur Robinson.

Nadvi, K. and Thoburn, J. (2003) *Vietnam in the Global garment and Textile Value Chain: Implications for Firms and Workers*. April, 2003. Institute of Development Studies School, University of Sussex, and the School of Development Studies, University of East Anglia. Department for International Development (DFID).

NAIC (2008) *Plan for expansion of Noi Bai Airport Approved*. Noi Bai Airport Information Center. Sunday, October 12th. Available: my.opera.com/naic/blog/show.dml/2629058 [17 Jan 2013].

NCS (2012) *About NCS*. Noi Bai Catering Services Joint-Stock Company. Available: http://www.noibaicatering.com.vn/HTML/Home_E.html [12 Dec 2012].

Nghi, D. Q. (2008) *Urbanization without sprawl: Viet Nam experiences and perspective*. 44th ISOCARP Congress 2008. Urban Environmental Planning Programme in Viet Nam. UEPP-VN.

Nghi, P. (2010) The Higher Education Reform Agenda: A Vision for 2020. in *Reforming Higher Education in Vietnam*. Institute of Human Studies, Vietnamese Academy of Social Sciences, Ha Noi, Viet Nam.

Ngo, T. H. (2010) *Urban Development Strategy for Vietnam Cities System to 2050*. International Conference on Eco2 Cities and Workshop for East Asia Piot Eco2 Cities; October 20-23, 2010, Yokohama, Japan. Available: http://siteresources.worldbank.org/INTURBANDEVELOPMENT/Resources/336387-1270074782769/6925944-1288991290394/Day1_P8_9_VIAP.pdf [10 Oct 2012].

Nguoi, V. (2012) *Hanoi Most Polluted City in Southeast Asia, Experts Say*. Vietnam News, March 24th, 2012. Available:http://newamericamedia.org/2012/03/hanoi-most-polluted-city-in- southeast [05 Jan 2013].

Nguyen, D. (2010) *Millenium Development Goals 2010 National Report - Vietnam 2/3 of the Way Achieving the Millenium Development Goals 2015 and Towards 2015*. Ministry of Planning and Investment. Available: http://www.undp.org.vn/digitalAssets/24/24255_Full_version_English2.pdf [05 Sep 2012].

Nguyen, H. (2009). *Long Thanh International Airport*. Vietnamese Economic News, No. 20/2009. Available: http://www.vietnam.ahk.de/fileadmin/ahk_vietnam/Articles_by_industry/Aviation/May_-_June_-_July/2009_5_20_VN_Economic_News__Long_Thanh_International_Airport.pdf [21 Nov 2012].

Nguyen, H. (2012a) Hanoi Attracts 510 Industrial Projects. Talk Vietnam. Available: http://talkvietnam.com/2012/04/hanoi-attracts-510-industrial-projects/#.UNjt_XdiJgU [18 Dec 2012].

Nguyen, J. (2012b). *VVNB - Noi Bai Airport - Ha Noi, Vietnam*. JeppView 3.7.5.0. Available: http://www.vnavirtual.org/charts/VVNB.pdf [21 Oct 2012].

Nguyen, D.H. (2012c). Interview with Mr. Nguyen Duc Hung. June 10th, 2012, Vice President of Northern Airports Corporation in Viet Nam.

Nguyen, M. T. (2008) *Dynamic Demographics and Economic Growth in Vietnam*. DEPOCEN Working Paper Series 2008/24. Center for Economic Development and Public Policy Vietnam-Netherland. Available: http://www.veam.org/papers2008/03%20Nguyen%20Thi%20Minh.pdf [12 Sep 2012].

Nguyen, S. (2006) *Chapter 3 Transportation in and around Hanoi: current issues and challenge*. Business Environment and Policies of Hanoi.

Nguyen, T. (2011) *The Trend of Vietnamese Household Size in Recent Years*. 2011 International Conference on Humanities, Society and Culture. IPEDR Vol. 20. Free University of Berlin Germany. Available: http://www.ipedr.com/vol20/10-ICHSC2011-M00023.pdf [12 Sept 2012].

Nguyen, V. and Nguyen, T. (2003) *Groundwater Pollution in the Hanoi Area, Vietnam*. Department of Geology and Minerals of Vietnam. The Northern Hydrogeological Engineering Geological Division. Available: http://www.unescap.org/esd/Energy-Security-and-Water-Resources/water/publications/CD/escap-iwmi/waterquality/Groundwater%20pollution%20in%20the%20Hanoi%20area,%20Vietnam.pdf [15 Dec 2012].

Niimi, Y., Thai, H.P., Reilly, B. (2008) *Determinants of Remittances: Recent Evidence Using Data on Internal Migrants in Vietnam*. World Bank Policy Research Working Paper 4586. Available: http://elibrary.worldbank.org/content/workingpaper/10.1596/1813-9450-4586 [10 Nov 2012].

NTZE (2009) Market Profile for Aviation in Southeast Aviation. New Zealand Trade & Enterprise. Available: http://www.nzte.govt.nz/explore-export-markets/market-research-by-industry/specialised-manufacturing/documents/aviation-market-in-southeast-asia-2.pdf [12 Jul 2012].

NUS (2009) *An Introduction to ASEAN: ASEAN's founding*. National University of Singapore. Available: http://cil.nus.edu.sg/an-introduction-to-asean/ [25 Oct 2012].

O

OECD (1993) International Air Transport: the Challenges Ahead. Organisation for Economic Co-operation and Development. Paris. Available: http://www.oecd.org/futures/38455426.pdf [20 Apr 2012].

OECD (2001) Policy Instruments for Achieving Environmentally Sustainable Transport. Organisation for Economic Co-operation and Development: Paris. Available: http://www.oecd-ilibrary.org/environment/policy-instruments-for-achieving-environmentally-sustainable-transport_9789264176249-en [24 Oct 2012].

OECD (2012) Green Growth and the Future of Aviation. Paper prepared for the 27th Round Table on Sustainable Development. 23-24, January, 2012. Available: http://www.oecd.org/sd-roundtable/papersandpublications/49482790.pdf [24 Oct 2012].

Oizumi, K. (2010) The Changing Face of Mega Cities in Asia's Emerging Economies: Rising Competitiveness and Expanding Markets. *Pacific Business and Industries* Vol. 10, No. 37. pp 1-20. Center for Pacific Business Studies, Economics Department, Japan Research Institute.

Okun, D. T., Lane, C. R., Pearson, D. R., Aranoff, S. L., Williamson, I. A., and Pinkert, D. A. (2010) *ASEAN: Regional Trends in Economic Integration, Export Competitiveness, and Inbound Investment for Selected Industries*. USITC Publication 4176, Investigation No. 332-511, August 2010. United States International Trade Commission.

O'Malley, P. (2006) Risks, Ethics and Airport Security. *Canadian Journal of Criminology and Justice*. Vol. 48, No. 3. June/July 2006; pp. 413-421.

Orlav, R. (2007). *Poor Training at LAX Called Risk to Public: Subcontracting Practice Criticized by Group's Report*. laane - A new economy for all. Available: http://www.laane.org/whats-new/2007/07/12/poor-training-at-lax-called-risk-to-public-subcontracting-practice-criticized-by-group%E2%80%99s-report/ [14 Jan 2013].

Oum T.H., Yan. J. and Yu, C. (2008). *Ownership forms matter for airport efficiency: A stochastic frontier investigation of worldwide airports*. Journal of Urban Economics 64 (2008) 422–435.

P

PAG (N.d.) *Development Plan for Phuket International Airport*. Phuket Airport Guide. Available: http://www.phuketairportonline.com/taxonomy/term/1 [24 Jul 2012].

Parker, A. (2012) Asia Gives Aviation Sector Reasons for Cheer. *Financial Times,* Feb, 13, 2012. Available:http://www.ft.com/intl/cms/s/0/a86755e4-46a5-11e1-bc5f-00144feabdc0.html#axzz2A3HJICi_1 [06 Sep 2012].

Penada, M., Reis, V., and Macario, M. (2010) *Airport-centred Urban Development: Concepts, Agents and Critical Factors*. Instituto Superior Tecnico, Universidade Tecnica de Lisboa, Portugal.

Perkins, D. H. and Vu T. T. A. (2010) *Viet Nam's industrial policy: Designing policies for sustainable development*. Policy Dialogue Paper Number 3. Paper Prepared under UNDP – Harvard Policy Dialogue Papers. Series on Viet Nam's WTO Accession and International Competitiveness Research. HCMC, January 2010.

Petri, P.A., Plummer, M.G., and Zhai, F. (2010) The Economics of the ASEAN Economic Community. Brandeis University. Available: http://www.brandeis.edu/departments/economics/RePEc/brd/doc/Brandeis_WP13.pdf [25 Aug 2012].

Pham, T. L. and Jones, N. (2011) Education for All in Vietnam: high enrolment, but problems of quality remain. *Young Lives Policy Brief 4*. Department of International Development (DFID), University of Oxford.

Pham, H. T., Tu, T. N., and van Westen, G. (2011) Food Security and Energy Development in Vietnam. The Focus: Food Security and Land Grabbing. *The Newsletter*. No. 58 Autumn/Winter 2011. Utrecht University and Hue Agricultural University.

Pittenger D. M. (2011) Evaluating Sustainability of Selected Airport Pavement Treatments with Life-Cycle Cost, Raw Material Consumption, and Greenroads Standards. Transportation Research Record: *Journal of the Transportation Research Board*. No. 2206, pp. 61-81.

Plummer M.G. and Chia S. Y. (2009) Assessing the Economics of the ASEAN Economic Community: Introduction. Institute of Southeast Asian Studies.

PM (2012). Phuket's Airport Expansion Set To Start In November. Phuket Magazine. Available: http://www.phuketmagazine.com/phukets-airport-expansion-set-to-start-in-november [25 Jul 2012].

Prosperi, D (2007) *Airports as Centers of Economic Activity: Empirical Evidence from Three US Metropolitan Areas*. Department of Urban and Regional Planning, Florida University.

PwC and CDC (2009) *CSR Trends 3; A comprehensive survey of corporate social responsibility report trends, benchmarks and best practices*. Joint report from PriceWaterhouseCoopers and Craib Design & Communications. Available: http://www.pwc.com/ca/en/sustainability/publications/ csr-trends-3-en.pdf [15 Nov 2012].

Q

Quang, N. H. (2005) *Guidelines for Handling and Preservation of Fresh Fish for Further Processing in Vietnam*. UNU-Fisheries Training Programme. Available: http://www.unuftp.is/static/fellows /document/quang05prf.pdf [19 Sep 2012].

R

RCAPL (2012) *Expansion of Changi International Airport Set To Meet Growing Demand of Flights*. Available: http://www.richmondcorporateadvisory.com/singapore-company-registration-articles /expansion-of-changi-international-airport-set-to-meet-growing-demand-of-flights/ [26 Jul 2012].

Reiss, B. (2007) Maximising non-aviation revenue for airports: Developing airport cities to optimise real estate and capitalise on land development opportunities. *Journal of Airport Management*. Vol. 1, pp. 284–293.

Ritchie, T. and and Miles, D. (2008). The Economic Impact of Growth at Sydney Airport. Prepared for Sydney Airport Corporation Limited. Available: http://www.sydneyairport.com.au/corporate/~ /media/Files/Corporate/About%20Us/Econ%20Impact%20Report%2008.pdf [15 Sep 2012].

Robertson, J. (1995) Airports and Economic Regeneration. *Journal of Air Transport Management*. Vol. 2, No. 2 (June 1995), pp: 81-88.

Rowlings, A. and Walker, A. (2008) *Sustainable Energy Options for the Future Airport Metropolis*. In Panagopoulous, T., Vaz, T., Antunes, M. and Burley, J. Proceedings 4th IASME/WSEAS International Conference (EEESD'08); pp 21-26, Algarve, Portugal.

Roy, A., Punhani, S., and Lau, J. (2010) Vietnam: Demographics continue to drive long-term growth. *Economics Research*. April 23rd, 2010. Credit Suisse.

Rushton, J., Thornton, P.K., and Otte, M.J. (1999). Methods Of Economic Impact Assessment. *Rev. Sci. Tech*, 1999, 18(2), 315-342.

S

SA (2012) *AOT pushed forward the Suvarnabhumi Airport Expansion Project (Phase II) with a budget of over 62.5 billion Baht*. Suvarnabhumi Airport Public Relations Office. Available: http://www.suvarnabhumiairport.com/detail_news_192_en.php [24 July 2012].

SAGA (2012) *Sustainable Aviation Guidance Alliance*. Website. Available: http://www.airportsustainability.org/ [15 Oct 2012].

Samy, S. (2010) *Cambodia eyes new airport for Siem Reap*. Flightglobal. Available: http://www.flightglobal.com/news/articles/cambodia-eyes-new-airport-for-siem-reap-347655/

[26 Jul 2012].

Schaafsma, M. (2005) Airport & City. Presentation Nov. 17th, 2005. Utrecht University.

Schaafsma, M. (2008) From Airport City to Airport Corridor: Airport and City, Sustainability and Economy. In Knippenberger, U. and Wall, A. (2009) *Airports in Cities and Regions*. Research and Practise. KIT Scientific Publishing. 2010. pp 173-181.

Schaar, D. and Sherry, L. (2010) *Analysis of Airport Stakeholders*. Paper Number: 109. Integrated Communications Navigation and Surveillance Conference (ICNS), 2010.

Schlaack, M. (2009) Defining the Airea - Evaluating urban output and forms of interaction between airport and region. In Knippenberger, U. and Wall, A. (2009) *Airports in Cities and Regions*: Research and Practise. KIT Scientific Publishing. 2010. pp 173-181.

Schmitt, J. and Warner, K. (2011) *Deconstructing Structural Unemployment*. Center for Economic and Policy Research.

Schwab, K. and Sala-i-Martin, X. (2012) *The Global Competitiveness Report 2012-2013*. Available: http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2012-13.pdf [20 Aug 2012].

Serebrisky, T. (2012) *Airports in Latin America and the Caribbean: Benchmarking, Regulation and Pricing*. The World Bank. Washington D.C.

Serrat, O. (2010) *The Livelihoods Framework*. Asian Development Bank.

SGGP (2011) Land Price in Hanoi Suburbs Surge on Town Planning Rumours. *Saigon Daily*. Available: http://www.saigon-gpdaily.com.vn/Business/Economy/2011/4/91250/ [18 Jan 2013].

Sheahan, M. and Choy, M. (2012) Munich Residents Vote Against New Airport Runway. *Reuters*. June, 17th 2012. Available: http://www.reuters.com/article/2012/06/17/munich-airport- idUSL5E8HD8D320120617 [07 Jan 2013].

Sheperd, B. and Wilson, J. S. (2009) Trade Facilitation in ASEAN Member Countries: Measuring Progress and Assessing Priorities. *Journal of Asian Economics* Vol. 20 (2009) pp 367-383. The World Bank.

Sheppard, S. and Stover, M. E. (1995) The Benefits of Transport Improvements in a City with Efficient Development Control. *Regional Science and Urban Economics* Vol. 25 (1995) pp. 211-222.

Shields, M. (1999) *Long Working Hours and Health*. Statistics Canada. Catalogue Number 75-001-XPE

Shimbun, Y. (2012) Make Kansai, Itami Airports more Attractive. *Daily Yomuri Online*. Editorial. Available: http://www.yomiuri.co.jp/dy/editorial/T120402003297.htm [06 Feb 2013].

Simon, S. (2008) ASEAN and Multilateralism: The Long, Bumpy Road to Community. *Contemporary Southeast Asia* Vol. 30, No. 2, pp. 264-92.

Solow, R.M. (1993) An Almost Practical Step toward Sustainability. Resource Policy 19. Available: http://dionysus.psych.wisc.edu/lit/topics/Environment/Sustainability-Solow.pdf [22 Apr 2012].

Stern, D.L. and Common, M.S. (2001) Is There An Environmental Kuznets Curve for Sulphur? *Journal of Environmental Economics and Management* Vol. 41: pp. 162-78.

Suther, K. (2006) The Association of Southeast Asian Nations. The Association of Southeast Asian Nations. *Contemporary Review*. pp. 337-340.

T

Tien, P. (2012) *Vietnam, Hanoi Announces New Poverty Line for 2011-2015*. NgoCentre. Available: http://www.ngocentre.org.vn/news/vietnam-hanoi-announces-new-poverty-line-2011-2015 [21 Jan 2013].

Tiessen, P. (2011) As Chinese Wages Rise, Hunt for Cheap Labor Lands in Vietnam. *Le Temps*. Available: http://worldcrunch.com/chinese-wages-rise-hunt-cheap-labor-lands-vietnam/culture-society/as-chinese-wages-rise-hunt-for-cheap-labor-lands-in-vietnam/c3s3397/#.UQ_2AaX7KSo [12 Jan 2013].

Thang, N., Trung, L. D., Dat, V. H., and Phuong, N. T. (2006) Poverty, Poverty Reduction and Poverty Dynamics in Vietnam. Background Paper for the Chronic Poverty Report 2008-09. Chronic Poverty Research Centre. United States Agency for International Development (USAID).

Thapa, R. and Murayama, Y. (2007) Land evaluation for peri-urban agriculture using analytical hierarchical process and geographic information system techniques: A case study of Hanoi. *Land Use Policy*. July 17th, 2007. Elsevier Publishing.

The Economist (2010) *Low Grades for the Party: The Communist Party's grip is holding back the country's best and brightest*. The Economist. September 30th, 2010. Available: http://www.economist.com/node/17155668 [18 Sep 2012].

The Economist (2012) *A Tiger at Bay: with little prospect of meaningful reform, the economy could get even shakier*. The Economist. September 15th, 2012. Available: http://www.economist.com/node/21562968 [30 Sep 2012].

Thi, T.V. (2009) *The Existing Sewerage and Drainage System in Hanoi*. Tu International 63, January 2009. Available: http://www.alumni.tu-berlin.de/fileadmin/Redaktion/ABZ/PDF/TUI/63/van_ngo_TUI63.pdf [10 Dec 2012].

Thomas, I., Stone, D., Tan, A., Drysdale, A., and McDermott, P. (2008) *Developing ASEAN's Single Aviation Market and Regional Air Services Arrangements with Dialogue Partners*. Final Report REPSF II Project No. 07/003. The Government of Australia.

Thuy, P (2007) *Microcredit training, helps Soc Son Women improve their lives*. Viet Nam News. March 22nd, 2007. Available: http://vietnamnews.vn/social-issues/population--development/162981/microcredit-training-helps-soc-son-women-improve-their-lives.html [20 Nov 2012].

Timbrell, G., Foth, M., and Hearn, G. (2006) Towards Knowledge Management for Explorers: The Case of the Brisbane Airport Corporation. *International Journal of Knowledge, Culture and Change Management* Vol. 6, No. 6; pp. 97-104.

TND (2011) *Rumors Spark Land Fever in Hanoi Suburbs*. Thanh Nien Daily. Available: http://www.thanhniennews.com/2010/pages/20110416122719.aspx [11 Dec 2012].

Tokura, A. (2010) *Ex-post Evaluation of Japanese ODA Loan Project National Highway no. 18 Improvement Project (1) (11)*. IC Net Limited. Japanese International Cooperation Agency (JICA). Available: http://www2.jica.go.jp/en/evaluation/pdf/2010_VNVII-6_4.pdf [15 Jan 2013].

Tran, D.T. (2012) Interview with Ms. Tran Thi Du on June 26th, 2012, president of the Women's Union of Soc Son.

Transparency International (2012) *Corruption Perceptions Index*. Transparency International. Available: http://www.transparency.org/country#VNM [19 Sep 2012].

Tuyet, D. T. A. (2012) Interview with Ms Dinh Thi Anh Tuyet on June 18th, 2012, CEO – Chairman of Board of Governance Viet Rural Enterprise Development Center

TV (2012). *Hanoi Needs $25b to build trade centers*. Talk Vietnam. Available: http://talkvietnam.com/2012/11/ha-noi-needs-25b-to-build-trade-centres/#.URAUyWeS_8k [19 Jan 2013].

U

UKTI (2011) *The Airport Sector in Vietnam*. United Kingdom Trade & Investment. The National Archives, London.

UN (2004). *The Socialist Republic of Viet Nam - Public Administration Country Profile*. United Nations. Available: http://unpan1.un.org/intradoc/groups/public/documents/un/unpan023247.pdf pdf [17 Jan 2013].

UN (2005) *Income Generation And Poverty Reduction: Experiences of Selected Asian Countries*. Development Papers No. 26. United Nations.

UN (2010) *Balancing Human, Economic and Sustainable Development - Synthesis Analysis of Viet Nam's Development Situation and Medium-term Challenges in Preparation of the UN One Plan 2012-2016*. United Nations Viet Nam.

UNCTAD (2010) *The Contribution of Tourism to Trade and Development*. United Nations Conference on Trade and Development. Trade and Development Board, Trade and Development Commission. Geneva 3-7 May, 2010. Item 5.

UNDP (2005) *Services Sector Development: A key to Viet Nam's sustainable growth*. Ministry of Planning and Investment, Vietnam. United Nations Development Programme. November, 2005.

UNDP (2010) *Removing Barriers Hindering Protected Area Management Effectiveness in Viet Nam*. United Nations Development Programme. Available: http://www.undp.org.vn/digitalAssets/27/27368_Protected_Area_Prodoc110124x.pdf [12 Oct 2012].

UNDP (2011) *Human Development Report 2011. Sustainability and Equity: A Better Future for All*. United Nations Development Programme. ISBN: 9780230363311. Available: http://hdr.undp.org/en/media/HDR_2011_EN_Complete.pdf [15 Sep 2012].

UNDP (2006) Human Development Report 2006. New York: United Nations.

UNEP (2012) National Hydropower Plan for Vietnam. United Nations Environment Programme Dams and Development Project. Available: http://www.unep.org/dams/documents/_ell.asp?story_id=15 [20 Sep 2012].

UNESCAP (2005) Achieving Environmentally Sustainable Development in Asia and the Pacific. Fifth Ministerial Conference on Environment and Development in Asia and the South Pacific. Available: http://www.unescap.org/mced/documents/presessions/English/SOMCED5_7E_Theme_Paper.pdf [02 Oct 2012].

UNESCAP (2009) The importance of tourism in South-East Asia. UNSD/UNWTAO Workshop on Tourism Statistics for South East Asian countries. Economic and Social Commission for Asia and the Pacific. Available: http://unstats.un.org/unsd/tradeserv/Workshops/Vientiane/4%20-%20ESCAP%20-%20Importance%20of%20tourism%20in%20South-East%20Asia.pdf [11 Oct 2012].

UNESCO (2003) *Internet in Education: Support Materials for Educators*. UNESCO Institute for information Technologies in Education.

UNICEF (2003) *At a glance: Viet Nam*. Statistics. The United Nations Children's Fund. Available: http://www.unicef.org/infobycountry/vietnam_statistics.html [02 Jan 2013].

UoT (2001). *Vietnam Maps*. University of Texas at Austin. Available: http://www.lib.utexas.edu/maps/vietnam.html [02 Nov 2012].

Upham, P. and Mills, J. (2005) Environmental and Operational Sustainability of Airports: Core Indicators and Stakeholder Communication. *Benchmarking: An International Journal*. Vol. 2, No. 2, pp. 166-179.

Upham, P., Thomas, C., Gillingwater, D., and Raper, D. (2003) Environmental Capacity and Airport Operations: Current Issues and Future Prospects. *Journal of Air Transport Management*, Vol. 9, pp 145-151, 2003.

USGS (2012) *2010 Mineral Yearbook: Vietnam*. U.S. Geological Survey. August, 2012. United States Department of the Interior.

V

van den Berg, L., Dinh, T., Xiaoping, S., and Kamphuis, B. (2006) *Towards Integrated Urban and Horticultural Planning in Hanoi and Nanjing*. Alterra-rapport 1395. Wageningen University.

van den Berg, L., van Wijk, M., and Hoi, P. (2003) The Transformation of Agriculture and Rural Life Downstream of Hanoi. *Environment and Urbanization*. Vol. 15, No. 35; pp. 35-51.

Van Elsacker, S. (2011). *Effects of land use and soil management on soil quality in the Mekong Delta, Vietnam*. Master Thesis in de Bio-Ingenieurswetenschappen: Milieutechnologie.

van Oortmerseen, S. (2008) *Determining Airport Sustainability*. Technical University of Delft, Faculty of Aerospace Engineering.

van Wijk, M. (2007) *Airports as Cityports in the City-region*. Netherlands Geographical Studies 353. PhD thesis, Faculty of Geosciences, Utrecht University.

Vanclay, F. (2003) International Principles for Social Impact Assessment. *Impact Assessment and Project Appraisal*. Vol 21, No. 1, March 2003, pp.5-11. Beech Tree Publishing.

VAT (2012) *The Project of Noi Bai Airport's T2 Terminal*. Vietnam Airlines. Available: http://www.vietnamairlinestickets.com/blog/news/the-project-of-noi-bai-airport-t2-terminal.html [12 Jan 2013].

VC (2008) *Hanoi: Polluted Underground Water and Alarming Depression*. Viwaseen Vietnam Water Supply Sewerage and Environment Construction Investment Corporation. Available: http://www.viwaseen.com.vn/en/index.php?p=news&area=1&newsid=50 [02 Jan 2013].

VDP (2004) *Vietnam Development Report: Poverty*. Hanoi: Culture and Information Publishing House.

Venckus, A. and Gaidelys, V. (2011). A Few Remarks on Assessment of Airport Economic Impacts. *Economics and Management*: 2011. Vol. 16.

Vettori, A. (2011). *Angst vor einer Lohnspiral nach unten*. Sueddeutsche Zeitung. Available: http://www.sueddeutsche.de/muenchen/erding/flughafen-muenchen-angst-vor-einer-lohnspirale-nach-unten-1.1026754 [19 Dec 2012].

VIR (2002) *New Players Club Together Bids for Stalled Golf Site*. Vietnam Investment Review. Available: http://www.highbeam.com/doc/1P1-55595139.html [24 Jan 2013].

VN (2012) *Foreign Carriers Open New Routes, Expand Operations*. Viet Nam News. Available: http://vietnamnews.vn/Economy/223892/foreign-carriers-open-new-routes-expand-operations.html [04 Jan 2013].

VNAT (2011) *International Visitors to Vietnam in December and 12 months of 2011*. Vietnam National Administration of Tourism. Available: http://www.vietnamtourism.gov.vn/english /index.php?cat=012040&itemid=5143 [16 Dec 2012].

VNE (2012) *Hanoi Metro Will Go Through the Old Town*. VnExpress. Available: http://vnexpress.net/gl/xa-hoi/2012/08/metro-ha-noi-se-di-qua-pho-co/ [15 Dec 2012].

VR (2012) *Inflation in Vietnam*. Vietnam Report. Available: http://www.vietnam-report.com/inflation-in-vietnam/ [12 Dec 2012].

VSGO (2010) *Migration and Urbanization in Vietnam: Patterns, Trends and Differentials*. The 2009 Vietnam Population and Housing Census: Major Findings. Vietnam General Statistics Office.

VTMGC (2012) *Van Tri Marsh Golf Course*. Available: http://www.vantrigolf.com.vn/#!/ [24 Jan 2013].

VTO (2008). *Country of Vietnam: General information on geography, climate and natural resources*. April 22nd, 2008. Vietnam Trade Office in the USA. Available: http://www.vietnam - ustrade.org /index.php?f=news&do=detail&id=37&lang=english [19 Sep 2012].

VTS (N.d.) *Tan Son Nhat International Airport*. Vietnam Transfer Service. Available: http://vietnamtransferservice.com/News/Tan_Son_Nhat_International_AirportTan_Son_Nhat_International_Airport-85.html [23 July 2012].

Vu, D. T.,Vu D. T., Walder, J., Schmutz, H. R. and Cao, T. H. (2007) Contamination by Selected Organochlorine Pesticides (OCPs) in Surface Soils in Hanoi, Vietnam. *Bull Environ Contam Toxicol* (2007) 78:195–200. DOI 10.1007/s00128-007-9149-z.

W

Wainwright, E. (2010) *Conflict Prevention in Southeast Asia and the South Pacific*. Center on International Cooperation. New York University.

Wang, J. (2009) An Empirical Study of the Relationship between Transportation and Economic Growth in Xinjiang Province. *International Business Research* Vol. 2, No. 2, April 2009. School of Economics and Trade, Shihezi University.

WB (2007) *Transport in Vietnam*. The World Bank. Available: http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/EXTEAPREGTOPTRANSPORT/0,,print:Y~isCURL:Y~contentMDK:20458737~menuPK:2069374~pagePK:34004173~piPK:34003707~theSitePK:574066,00.html [03 Jan 2013].

WB (2008) *Attacking Air Pollution in Hanoi*. The World Bank. Available: http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/VIETNAMEXTN/0,,contentMDK:21685517~menuPK:50003484~pagePK:2865066~piPK:2865079~theSitePK:387565,00.html [03 Jan 2013].

WEF (2012) *The ASEAN Travel and Tourism Competitiveness Report 2012: Fostering Prosperity and Regional Integration Through Travel and Tourism*. World Economic Forum. WEF Insight Report. World Economic Forum.

Wells, A. and Young, S. (2004) *Airport Planning and Management*. Fifth ed. McGraw-Hill, New York.

WFA (2012) Vietnam targets US$650m increase in fishery exports. *World Fishing & Aquaculture*. August 7th, 2012. Available: http://www.worldfishing.net/features101/new-horizons/vietnam - targets-us$650m-increase-in-fishery-exports [19 Sep 2012].

WFW (2010) *Infrastructure Development in Vietnam*. Watson, Farley & Williams Briefing. Available: http://www.wfw.com/website/wfwwebsite.nsf/Publications/Publication553.html /$File/ WFW%20Infrasstructure%20Development%20in%20Vietnam%20update.pdf [12 Dec 2012].

Wheeler, J. (2005) *Airport Security and Policing Review: An Independent Review of Airport Security and Policing for the Government of Australia*. Commonwealth of Australia, Canberra.

Whitelegg, J. and Cambridge, H. (2004) *Aviation and Sustainability*. Policy Paper July, 2004. Stockholm Environment Institute.

WHO (2009a) *Millennium Development Goals*. World Health Organization Representative Office in Viet Nam. Available: http://www2.wpro.who.int/vietnam/mdg.htm [18 Sep 2012].

WHO (2009b). *WHO in Vietnam*. World Health Organization. Available: http://www2.wpro.who.int/vietnam/about_us/about_who_vtn.htm [21 Sep 2012].

Wong, E.P.Y., Mistils, N. and Dwyer, Larry. (2011) A Model Of ASEAN Collaboration in Tourism. *Annals of Tourism Research*,Vol. 38, No. 3, pp. 882–899, 2011.

World Bank (2011a) *Taking Stock: An update on Vietnam's recent economic developments*. Annual Consultative Group Meeting for Vietnam. December 6th, 2011, Hanoi. World Bank.

World Bank (2011b). *Mortality Rate, under 5 (per 1,000 live births)*. Levels & Trends in Child Mortality, Report 2011. Available: http://data.worldbank.org/indicator/SH.DYN.MORT [17 Sep 2012].

World Bank (2012a) *Data- Agricultural land (% of land area)*. Food and Agriculture Organization, electronic files and website. Available: http://data.worldbank.org/indicator/AG.LND.AGRI.ZS?order=wbapi_data_value_2009+wbapi_data_value+wbapi_data_value-last&sort=asc [10 Sep 2012].

World Bank (2012b). *Rural Development & Agriculture in Vietnam*. Rural Development and Agriculture in East Asia and Pacific. Available: http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/EXTEAPREGTOPRURDEV/0,,contentMDK:20534368~menuPK:3127821~pagePK:34004173~piPK:34003707~theSitePK:573964,00.html [20 Sep 2012].

World Bank (2012c). *Vietnam*. World Development Indicators. Available: http://data.worldbank.org/country/vietnam [19 Sep 2012].

World Bank (2012d). Vietnam Overview. Available: http://www.worldbank.org/en/country/vietnam/overview [18 Sep 2012].

WTO (2010) *Tourism 2020 Vision*. World Tourism Organization Facts and Figures: Information, Analysis and Know-how. Available: http://www.unwto.org/facts/menu.html [12 Nov 2012]

Y

Yandle, B., Vijayaraghavan, M. and Bhattarai, M. (2002). The Environmental Kuznets Curve: A Primer. *PERC Research* 02-01. May, 2002.

Yang, S. (2001). The Future of Regional Cooperation in Asia: ASEAN's Policy Toward ASEM. *East Asian Review* Vol. 12, No. 4, pp 79-92. Institute for East Asian Studies.

Yeo, G.L. (2010). *Chiang Mai airport completes 2bn baht expansion*. Flightglobal. Available: http://www.flightglobal.com/news/articles/chiang-mai-airport-completes-2bn-baht-expansion-339106/ [25 Jul 2012].

Appendix I – Natural Resources

Viet Nam is a country of abundant natural resources and an important supplier of fossil fuels for the domestic and regional market. Offshore crude oil reserves are estimated at 4.4 billion barrels, representing 0.3 percent of known global reserves and the third largest stock in the region behind China and India (EIA 2012; BP 2012). Natural gas deposits exceed 57 billion cubic meters and are expected to reach 360 billion cubic meters with continued exploration. According to the World Bank (2010), the natural gas sector will triple over the next fifteen years and become one of the main pillars of domestic energy supply. Viet Nam is also abundant in mineral resources such as gold, iron ore and bauxite, with potentially recoverable coal reserves ranging from seven to eight billion tons (VTO 2008). The mining sector, one of the building blocks of the Vietnamese economy, produced an estimated output value of 157 billion dollars in 2010. At the same time investments in mining totalled USD 1.5 billion, which represents seven percent of all investment in the economy. (USGS 2012). Viet Nam also offers ideal natural conditions for the use of hydropower, as the host of thirteen river systems covering a total area of more than 10,000 km², a varied topography, and humid climate (Hanh and Dong 2011). Its total potential capacity is estimated between 14.000 to 17.000 MW, of which 4.100 MW, or half of total domestic electricity output, have been developed up to this point (UNEP 2012).

Appendix II – ASEAN Airport Database

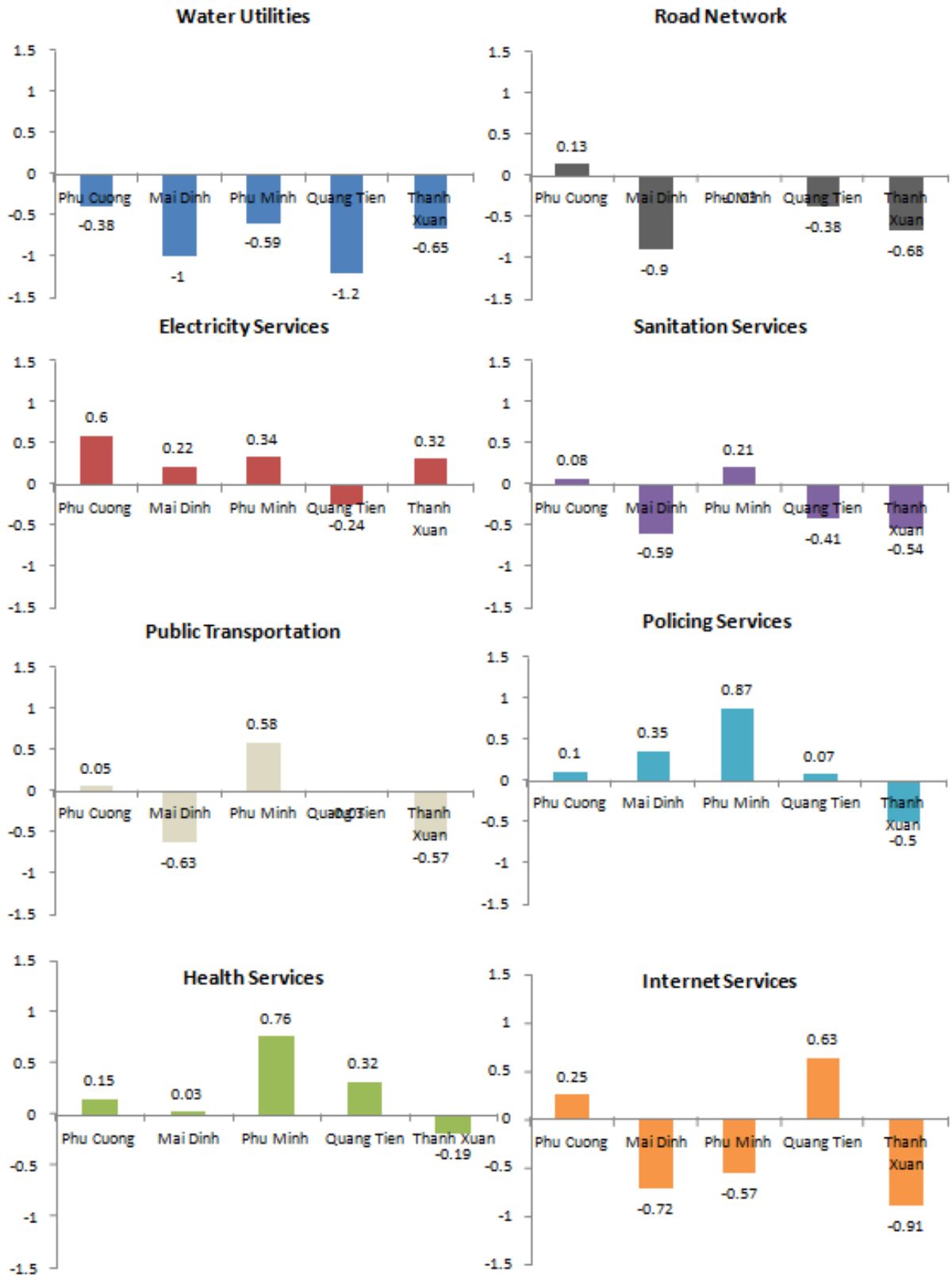
ASEAN Member States	Global Competitiveness Index (out of 144)	LPI Index Rank (out of 155)	Population (million)	Location	Airport	Status	Passenger Capacity	Passenger Volume 2010	Passenger Volume 2011	Passenger Volume Predictions	Passenger Volume Growth Rate (%)	Total Cargo Volume 2010	Total Cargo Volume 2011	Cargo Volume Growth Rate (%)	Expansion Projects	Land Classification
Republic of Indonesia (Indonesia)	50	59	250	Jakarta	Soekarno-Hatta International Airport (CGK)	International	38 million	44,355,998	51,178,188	By 2017 the airport is estimated to handle more than 75 million passengers a year.	15.4	523,350	582,088	11.2	*"Runways 1 and 2 will be expanded by adding a taxiway and parking space for 174 aircraft. The plan also includes the rehabilitation of terminals 1 and 2, the development of a cargo terminal and supporting facilities, and the construction of an integrated building, which will connect terminals 1, 2 and 3".* Additionally two new runways will be built.	The airport is located 20 kilometers west of Jakarta city center in Cengkareng. It is situated in a peri-urban setting featuring both agricultural villages and modern residential areas.
				Denpasar Bali	Ngurah Rai International Airport (DPS)	International	8 million (apparently it handled 11.1 million passengers in 2011, which is contradictory to ACI figures).	6,855,054	6,818,845	According to estimates the airport will handle around 20 million passengers annually by 2017.	-0.5	55,592	48,231	-13.2	*"The expansion of the airport started in November 2010 after several months of delay. The government will spend $187m towards the project that is expected to be completed by 2013. The programme will involve extension of the international and domestic terminals and the expansion of parking lots and other facilities. The international terminal area will be extended from 65,800m² to 120,000m² and the domestic terminal will be expanded in size from 13,300m² to 65,800m². The new expansion project is expected to increase the annual passenger handling capacity*	The airport is located 13 km south of Denpasar in the municipality of Kuta and the immediate vicinty of the sea. The surrounding districts are characterisized by peri-urban development with both agriculture and tourism as main income sources.
				Medan	Polonia International Airport (MES)	International	No data available	6,189,575	7,170,107	Kuala Namu International Airport will replace Polonia.	15.8	36,856	48,418	31.4	The airport will be replaced by Kuala Namu International Airport, which is expected to be completed in 2012 with commercial operations starting in early 2013. *" Kualanamu is forecast to have an annual capacity of 8 million, which would make it the second largest airport in the country, behind Soekarno-Hatta International Airport in*	The airport is located about 4 kilometeres from the CBD and surrounded by dense urban built-up.
Republic of the Philippines (Philippines)	65	52	94	Manila	Ninoy Aquino International Airport (MNL)	International	28 million	27,135,752	29,552,294	No data available.	8.9	423,828	410,377	-3.2	Upgrade Terminal 3	The airport is surrounded by dense urban built up and located between Manila and Paranaque City.
				Cebu City	Mactan-Cebu International Airport (CEB)	International	2.5 million	5,413,452	6,215,946	*" Over the last 20 years, Mactan (Cebu) International Airport's passenger traffic increased to an annual average of 13% for the international while the domestic grew an annual average of 7%. "*	14.8	54,877	51,783	-5.6	*" Mactan (Cebu) International Airport Authority (MCIAA) plans of expanding the terminal. Other major projects are establishing a Cargo Terminal, new generation terminal building, Maintenance Repair and Overhaul (MRO) Facility, Aircraft Assembly Plant, Parallel Runway, Airport Rail Network, Airport Road Network, a Multi-Modal Transport System or an Airport City. "*	"The *airport is located on Mactan Island, province of Cebu in the Central Philippines and connected to Cebu City, the provincial capital 20 kilometers due southwest, through the Mactan-Mandaue bridge and Marcelo Fernan bridge.* " The surrounding area is predominantely peri-
				Davao City	Francisco Bangoy International	International	1 million	1,967,945	2,664,210	No data available.	35.4	15	85	463.3	No data available.	Located on the island of Mindanao, the airport is situated in a peri-urban

ASEAN Member States	Global Competitiveness Index (out of 144)	LPI Index Rank (out of 155)	Population (million)	Location	Airport	Status	Passenger Capacity	Passenger Volume 2010	Passenger Volume 2011	Passenger Volume Predictions	Passenger Volume Growth Rate (%)	Total Cargo Volume 2010	Total Cargo Volume 2011	Cargo Volume Growth Rate (%)	Expansion Projects	Land Classification
Socialist Republic of Vietnam (Vietnam)	75	53	88	Hanoi	Noi Bai International Airport (HAN)	International	6 million	9,519,839	10,797,923	12 million in the medium run; 20 million by 2020 (1).	13.4	216,901	252,046	16.2	*" T2 construction is scheduled to begin by the third quarter of 2011, with completion slated for 2014. At this time the existing T1 terminal will be modified to become a domestic passenger terminal. "*	The airport is located about 45 kilometers from downtown Hanoi and surrounded by small, agricultural villages and an
				Ho Chi Minh City	Tan Son Nhat International Airport (SGN)	International	15-17 million	15,150,000	16,668,400	No data available.	10.0	531,269	593,494	11.7	By 2020 a new "super" airport is to be built 40 kilometers outside the city in Long Thanh with a capacity of 100 million passengers. Tan Son Nhat will then be transformed into a domestic airport.	Located 6 kilometers from the center, the airport is situtated within the city and surrounded by mostly
				Da Nang	Da Nang International Airport (DAD)	International	4-6 million	No data available.	No data available.	No data available.	#VALUE!	No data available.	No data available.	#VALUE!	*" A new passenger terminal opened in December 2011 with 4-6 million passenger capacity. "*	The airport is located 2 kilometers from Danang city center in a peri-urban setting.
Kingdom of Thailand (Thailand)	45	38	70	Bangkok	Suvarnabhumi International Airport (BKK)	International	45 million	42,784,967	47,910,904	More than 60 million by 2018.	12.0	1,310,146	1,321,853	0.9	*"Expansion projects include the construction of a sub-concourse building with the utilizing area of 216,000 m2, 28 aircraft parking bays closed to the building, an aircraft parking yard with total area of 360,000 m2 and the construction of the tunnel extension on the south side as well as the passenger transportation system. An extension of the existing passenger terminal at the east side, and the construction of an airline office building and parking yard will follow. The project will be completed in 2017 and is additionally capable to accommodate 15 million passengers annually. Altogether Suvarnabhumi Airport will have the capacity in accommodating totally 60 million passengers annually. "*	Suvarnabhumi International Airport is situated about 25 kilometers from Bangkok city center and surrounded by rural and peri-urban zones.
				Phuket	Phuket International Airport (HKT)	International	6.5 million	7,313,783	8,467,995	*" Thailand's six main airports reported a 15.8% rise in passenger traffic to 68.3 million for the year ending in September 2011, compared with the corresponding period in 2010. "*	15.8	27,788	26,158	-5.9	*"Expansion comprises work on the runway's landing and take-off areas, including the refuelling zone, as well as the airport's internal road system. Work will also start at the same time on the car park and buildings for housing a new cargo office, the Airports of Thailand (AoT) office and the airport's fire service. Furthermore, construction of the new international terminal and refurbishment work on the domestic terminal are expected to begin in July 2012."* The project will cost 5.8 billion	Located 32 kilometres from the centre of Phuket City, this airport is situated in a rural area with some residential buildings and holiday resorts.
				Chiang Mai	Chiang Mai International Airport (CNX)	International	2 million	3,178,941	3,880,037	No data available.	22.1	20,844	21,723	4.2	The airport has completed a two billion baht ($61.2 million) expansion, including a new terminal building for international passengers. As a result, the airport can now handle 8 million passengers	About 3 kilometers from Chiang Mai city center, this airport is situated in a peri-urban setting.

ASEAN Member States	Global Competitiveness Index (out of 144)	LPI Index Rank (out of 155)	Population (million)	Location	Airport	Status	Passenger Capacity	Passenger Volume 2010	Passenger Volume 2011	Passenger Volume Predictions	Passenger Volume Growth Rate (%)	Total Cargo Volume 2010	Total Cargo Volume 2011	Cargo Volume Growth Rate (%)	Expansion Projects	Land Classification
Republic of the Union of Myanmar (Burma)	No data available	129	48	Mandalay	Mandalay International Airport (MND)	International	3 million	No data available.	No data available.	The airport has a total capacity to three million passengers annually. No growth predictions could be found.	#VALUE!	No data available.	No data available.	#VALUE!	No data available.	The airport is located 35 km south of Mandalay in Tada-U, a remote rural area with few villages.
				Yangon	Yangon International Airport (RGN)	International	2.7 million	2,460,000	3,000,000	The government plans to increase the capacity from 2.7 million passengers a year to 3.8 million.	22.0	No data available.	No data available.	#VALUE!	*"The government has plans to increase the capacity from 2.7 million passengers a year to 3.8 million. No timeframe was given for upgrading the international terminal, which opened only four years ago ."*	Located in Mingaladon, 15 kilometres north of downtown Yangon, the airport is almost entirely surrounded by suburban
				Naypyidaw	Nay Pyi Taw International Airport (NYT)	International	No data available	No data available.	No data available.	No data available.	#VALUE!	No data available.	No data available.	#VALUE!	*" The new airport will be built in three stages. After the first phase is completed, the airport will be able to cope with 3.5 million passengers, and after the third phase is completed, it will be able to cope with 10.5 million passengers annually ."*	Loated 16 kilometers southeast of Naypyidaw, the capital of Burma, the airport us surrounded by small, agricultural villages.
Malaysia	27	29	29	Kuala Lumpur	Kuala Lumpur International Airport (KLIA)	International	35 million in current phase	34,087,636	37,704,510	60 million by 2014.	10.6	694,296	694,311	0.0	Opened in 1998, the airports is undergoing three expansion phases. By 2020 it will be able to handle up to 100 million passengers.	Situated about 50 kilometers south of Kuala Lumpur, the airport is surrounded by agricultural communities.
				Kota Kinabalu	Kota Kinabalu International Airport (BKI)	International	2.5 million	5,223,454	5,808,639	*" Passengerr figures are growing at 5%-8% a year ."*	11.2	28,891	30,344	5.0	The airport has received a major overhaul starting in 2009 with an extension of the runway, an upgrade of the terminal and a new tower.	The airport is located approximately 8 km from the city of Kota Kinabalu, bordered by the sea and urban developments.
				Georgetown	Penang International Airport (PEN)	International	5 million	4,166,969	4,600,274	Up to 5 million passengers by 2012.	10.4	147,061	131,857	-10.3	*" The $82 million upgrade of the airport started in June 2011 and is being delivered in three phases. The first phase involves upgrade of the main infrastructure and utilities and related buildings; the second phase covers the main terminal building and the third involves upgrades of outside area facilities at the airport ."*	Located 16 km south of Georg Town, the airport is surrounded by industrial parks and some residential areas. It is situated on an island and close to the sea.
Kingdom of Cambodia (Cambodia)	85		14	Phnom Penh	Phnom Penh International Airport (PNH)	International	2 million	1,719,076	1,887,170	*" Phnom Penh and Siem Reap international airports are expecting to break the 2 million passenger mark a year in 2012."* This number	9.8	19,763	19,389	-1.9	The last major expansion phase was concluded in 2009, with a new international terminal and a new cargo building.	This airport is located 7 kilometers west of Phnom Penh and is surrounded by peri-urban to urban developments.
				Siem Rap	Siem Reap International Airport (REP)	International	2 million	1,598,319	1,836,242	"Phnom Penh and Siem Reap international airports are expecting to break the 2 million passenger mark a year	14.9	528	200	-62.1	New airport at different location to be built with a capacity of up to 15 million passengers.	While there is some development around the airport, the whole region is predominantely rural.
				Sihanoukville	Sihanouk International Airport (KOS)	International	No data available	589	865	*" Passenger traffics at Phnom Penh, Siem Reap and Sihanouk International airports saw a combined 18.3% growth in May 2012, with passenger numbers totaling 283,000. This brings the year-to-date*	46.9	No data available.	No data available.	#VALUE!	No data available.	Located 18 kilometers from downtown Sihanoukville, there are not settlements in the vicinity of the airport.

ASEAN Member States	Global Competitiveness Index (out of 144)	LPI Index Rank (out of 155)	Population (million)	Location	Airport	Status	Passenger Capacity	Passenger Volume 2010	Passenger Volume 2011	Passenger Volume Predictions	Passenger Volume Growth Rate (%)	Total Cargo Volume 2010	Total Cargo Volume 2011	Cargo Volume Growth Rate (%)	Expansion Projects	Land Classification
Lao People's Democratic Republic (Laos)	No data available	109	6	Vientiane	Wattay International Airport (VTE)	International	No data available	No data available.	No data available.	No data available.	#VALUE!	No data available.	No data available.	#VALUE!	The airport is to receive a $ 23.4 million facelift. This will include the expansion of the aircraft parking apron; an upgrade to the gateway's security equipment; as well as various other measures such as an extension of the runway by 260 meters (1).	Located 3 kilometers from the center of Vientiane, the airport is surrounded by peri-urban developments.
				Luang Prabang	Luang Prabang International Airport (LPQ)	International	No data available	No data available.	No data availble.	No data available.	#VALUE!	No data available.	No data available.	#VALUE!	*" The airport expansion work, scheduled for completion in 2013, will include the construction of a 3,000m runway to accommodate larger aircraft. The airport construction project will cost 736b kip (US$86.4m), which will be financed by a special credit loan from the Chinese Government.Luang Prabang deputy governor Khampheng Saiyasompheng said 500 families would be relocated from the construction site ."*	The airport is located 2 kilometers from Luang Prabang center in a peri-urban to rural setting.
				Pakse	Pakse International Airport (PKZ)	International	No data available	No data available.	No data available.	No data available.		No data available.	No data available.	#VALUE!	Runway extensions.	The airport is located about 3 kilometers from downtown Pakse and surrounded by small villages.
Republic of Singapore (Singapore)	2	1	5	Singapore	Singapore Changi Airport (SIN)	International	66 million	42,038,777	46,543,845	56 passengers by 2017.	10.7	1,841,004	1,898,850	3.1	1000 ha of land have been earmarked for development, which will almost double the size of the airport (currently 1350 ha) ; budget terminal to be demolished to make way for new Terminal 4 with capacity for 16 million passengers.	Situated on a peninsula in the Southeast. West: dense urban build up; North: recreational areas; East: military base; South: golf
State of Brunei (Brunei Darussalam)	28	No data available	0.4	Bandar Seri Begwan	Brunei International Airport (BWN)	International	1.5 million	1,929,362	2,017,128	3 million by 2014.	4.5	28,024	No data available.	#VALUE!	This aiport will be modernized for US $ 130 million. This includes the expansion of floor areas by 50 percent, an improved baggage handling system and better security facilities. The project, scheduled for completion in November 2014, is expected to double the airport's handling capacity from the current 1.5 million passengers to 3 million	About 8 kilometers from Bandar Seri Begawan city center, the airport is surrounded by moderately dense urban districts. Golf course on the southern tip of the runway

Appendix III – Perception of Public Services



Appendix IV – ASEAN Development Indicators

	HDI Rank 2011	Life expectancy at birth (years) 2011	Proportion of Pop. Living on Less than $1.25 a Day (1990–2003) Years (%) 1	Proportion of Pop. Living on Less than $1.25 a Day (1996–2010) Years (%) 1	Gross national income (GNI) per capita (constant 2005 PPP $)	Mean years of schooling (years) 2011	Expected years of schooling (years) 2011
Brunei	33	78.0	no data	no data	45,753	8.6	14.1
Cambodia	139	63.1	44.5 (1994)	22.8 (2008)	1,848	5.8	9.8
Indonesia	124	69.4	54.3 (1990)	18.1 (2010)	3,716	5.8	13.2
Laos	138	67.5	55.7 (1992)	33.9 (2008)	2,242	4.6	9.2
Malaysia	61	74.2	1.6 (1992)	0.0 (2009)	13,685	9.5	12.6
Myanmar	149	65.2	no data	no data	1,535	4.0	9.2
Philippines	112	68.7	30.7 (1991)	18.4 (2009)	3,478	8.9	11.9
Singapore	26	81.1	no data	no data	52,569	8.8	14.4
Thailand	103	74.1	11.6 (1990)	0.4 (2009)	7,694	6.6	12.3
Viet Nam	128	75.2	63.7 (1993)	16.9 (2008)	2,805	5.5	10.4

Based on UNDP 2011 and ADB (2012, 62)

Appendix V - Questionnaires

INTERVIEW LOCATION:……..…….DATE:……/……../2012

Questionnaire: Sustainable Development Noi Bai Airport, Hanoi – Airport Employees

Dear Sir or Madame, we are researchers from Utrecht University, the Netherlands. The purpose of this survey is to obtain information on the social and economic impacts of Noi Bai Airport on the local population. The interview is conducted under the principle that all answers are provided on a voluntary basis and any questions deemed too personal may be omitted. This questionnaire is only for educational purposes and no information will be given to third party members. **YOUR INFORMATION WILL BE KEPT STRICTLY CONFIDENTIAL AND ANONYMOUS**. Thank you for your participation in our project.

A. Basic Information

1. Sex:
□ male □ female

2. Age:
□ 18-25 □ 26-33 □ 34-41 □ 42-49 □ 50- 59 □ 60+

3. Marital status:
□ single □ married □ divorced/widowed

4. Number of people living in your household (such as family members or roommates):
□ 1 □ 2-4 □ 5-8 □ 8+

5. Education (please check the highest level attained):
□ primary school □ some secondary school □ secondary school completed □ some high school
□ high school completed □ university (bachelor) □ university (master) □ college □ technical school □ other

6. Language skills:
□ Vietnamese □ French □ Chinese □ English □ other

7. Nationality:
□ Vietnamese □ Foreign National □ Ethnic minority

B. Economic Analysis

8. In what sector of the airport are you employed?
□ passenger-related □ security □ flight management □ air-traffic control □ ground services □ other

9. What is your job at the airport?

10. Do you have (an) additional job(s)?
□ Yes □ No If yes, which?

11. How many hours per week do you work approximately?
primary job: secondary job: tertiary job:

12. How long have you been employed at the airport (main job)?
□ 0-3 months □ 3 months - 1 year □ 1 - 5 years □ more than 5 years

13. How long have you been working in the same job at the airport?
□ 0-3 months □ 3 months - 1 year □ 1 - 5 years □ more than 5 years

14. Are you directly employed with the airport or do you work for a sub-contractor?
□ directly employed □ sub-contractor

15. How did you find your current job at the airport?
□ friend □family □ agency □ advertisement □ school □ previous employer □ other

16. What was the main reason for seeking employment at the airport?
□ salary □ challenging work □ no other work available □ training opportunities □ work environment

17. Does another member of your family have a job at the airport?
□ Yes □ No If yes, please list which job:

18. What is the biggest obstacle to finding employment or another job at the airport?
□ there are not enough jobs available □ the jobs that are available require higher education □ potential workplaces are too far away
□ I do not have friends/family that can offer me a job □ I cannot find a job due to my ethnicity □ I cannot find a job due to my gender

PLEASE FILL IN BOTH SIDES

19. If you lost your job, how long would your savings last?
□ less than 1 month □ 1 month □ 2 months □ 3 months □ more than 4 months

20. Do you own…
□ motorcycle □ car □ bicycle □ apartment □ house □ land □ livestock □ computer

21. What is your monthly take-home income (VND)?
□ 0-1 million □ 1 million – 2 million □ 2 million – 4 million □ 4 million – 10 million □ 10 million+

22. After paying all your bills and taxes, approximately how much money (VND) do you have left in your pocket?
□ 0-1 million □ 1 million – 2 million □ 2 million – 4 million □ 4 million – 10 million □ 10 million+

C. Social Analysis

23. Please rate the following workplace-related services at the airport on a scale from 1–5 (1=very poor, 2=poor, 3=average, 4=good, 5=excellent)

a) Salary	□1	□ 2	□ 3	□ 4	□ 5
b) Workplace safety	□1	□ 2	□ 3	□ 4	□ 5
c) Training opportunities	□1	□ 2	□ 3	□ 4	□ 5
d) Career opportunities	□1	□ 2	□ 3	□ 4	□ 5
e) Job security	□1	□ 2	□ 3	□ 4	□ 5

24. Which of these workplace-related services would you like to see improved? Please indicate your top three (1,2,3)
□ salary □ workplace safety □ training opportunities □ career opportunities □ job security

25. How would you rate your overall work experience at the airport?
□ very negative □ negative □ neither positive or negative □ positive □ very positive

26. Are there training opportunities funded by the airport?
□ Yes □ No If yes, which are these?

27. How often do you use services that do not include travel at the airport? Clarify with interviewer (e.g. shopping, taxis, banks/ATMs)
□ every day □ every week □ once a month □ a few times a year □ never

28. Do you receive additional benefits from working at the airport?
□ housing □ medical □ education/training □ transportation subsidy □ none

29. Would you like further investments at the airport?
□ Yes □ No

30. How many people are dependent on your income?
□ Only myself □ 2 □ 3 □ 4 □ 5 or more

31. How far do you commute to work?
□ less than 5 kilometers □ 5-10 kilometers □ 10-20 kilometers □ 20-50 kilometers □ more than 50 kilometers

32. How do you get to work?
□ motorcycle □ bicycle □ car □ bus □ carpooling □ on foot

33. The education I obtained is relevant for my current position.
□ strongly disagree □ disagree □ neither □ agree □ strongly agree

34. All employees are treated equally at the airport.
□ strongly disagree □ disagree □ neither □ agree □ strongly agree

35. Have the prices for land/rent in your area of residence increased over the past 5 years?
□ Yes □ No □ If yes, what are the consequences?

36. Please estimate how you spend your monthly income in percentages
Accommodation……..% food/beverage……..% transportation……..% leisure……..% education……..% utilities……..%

37. Please indicate which statement applies:
□ I have been living in Hanoi all my life □ I moved here due to work □ I moved here because of my family □ other

38. If you are not from Hanoi, please indicate which country/district in Vietnam you come from

PLEASE FILL IN BOTH SIDES

INTERVIEW LOCATION:……..……..……..DATE:……/……../2012

Questionnaire: Sustainable Development Noi Bai Airport, Hanoi – Local Communities

Dear Sir or Madame, we are researchers from Utrecht University, the Netherlands. The purpose of this survey is to obtain information on the social and economic impacts of Noi Bai Airport on the local population. The interview is conducted under the principle that all answers are provided on a voluntary basis and any questions deemed too personal may be omitted. This questionnaire is only for educational purposes and no information will be given to third party members. **YOUR INFORMATION WILL BE KEPT STRICTLY CONFIDENTIAL AND ANONYMOUS**. Thank you for your participation in our project.

A. Basic Information

1. Sex:
□ male □ female

2. Age:
□ 18-25 □ 26-33 □ 34-41 □ 42-49 □ 50- 59 □ 60+

3. Marital status:
□ Single □ married □ divorced/widowed

4. Number of people living in your household (such as family members or roommates):
□ 1 □ 2-4 □ 5-8 □ 8+

5. Education (please check the highest level attained):
□ primary school □ some secondary school □ secondary school completed □ some high school
□ high school completed □ university (bachelor) □ university (master) □ college □ technical school □ other

6. Language skills:
□ Vietnamese □ French □ Chinese □ English □ other

7. Nationality:
□ Vietnamese □ Foreign National □ Ethnic minority

B. Economic Analysis

8. Employment Status:
□ self-employed □ employed □ dependent (work in family business/farm) □ unemployed □ retired

9. Which sector are you employed in?
□ agriculture □ services □ manufacturing □ public servant

10. What is (are) your occupation(s)? Please list all.
primary job: secondary job: tertiary job:

11. How many hours per week do you work approximately?
primary job: secondary job: tertiary job:

12. How long have you been employed at your main occupation?
□ 0-3 months □ 3 months - 1 year □ 1 - 5 years □ more than 5 years

13. How did you find your current job?
□ friend □ family □ agency □ advertisement □ school □ previous employer □ other

14. If you lost your job, how long would your savings last?
□ less than 1 month □ 1 month □ 2 months □ 3 months □ more than 4 months

15. Do you own…
□ motorcycle □ car □ bicycle □ apartment □ house □ land □ livestock □ computer

16. Do you or a member of the family/friends hold a position at the airport?
□ Yes □ No

17. What is your monthly take-home income (VND)?
□ 0-1 million □ 1 million – 2 million □ 2 million – 4 million □ 4 million – 10 million □ 10 million+

18. After paying all bills and taxes, approximately how much money (VND) does your family have left at the end of the month?
□ 0-1 million □ 1 million – 2 million □ 2 million – 4 million □ 4 million – 10 million □ 10 million+

PLEASE FILL IN BOTH SIDES

C. Social Analysis

19. Please rate the following services in your area on a scale from 1–5 (1=very poor, 2=poor, 3=average, 4=good, 5=excellent)

a) Water	□1	□ 2	□ 3	□ 4	□ 5
b) Roads	□1	□ 2	□ 3	□ 4	□ 5
c) Electricity	□1	□ 2	□ 3	□ 4	□ 5
d) Sanitation	□1	□ 2	□ 3	□ 4	□ 5
e) Public Transportation	□1	□ 2	□ 3	□ 4	□ 5
f) Policing	□1	□ 2	□ 3	□ 4	□ 5
g) Education	□1	□ 2	□ 3	□ 4	□ 5
h) Health	□1	□ 2	□ 3	□ 4	□ 5
i) Internet	□1	□ 2	□ 3	□ 4	□ 5

20. Which of the following services would you like to see improved? Please indicate no more than three in order of importance (1,2,3)

… water … roads … electricity …sanitation … public transportation … policing … education … health
… internet … other; please specify…….

21. Please rate the following environmental indicators (1=very poor, 2=poor, 3=average, 4=good, 5=excellent)

a) Air	□1	□ 2	□ 3	□ 4	□ 5
b) Water	□1	□ 2	□ 3	□ 4	□ 5
c) Soil	□1	□ 2	□ 3	□ 4	□ 5
d) Noise	□1	□ 2	□ 3	□ 4	□ 5

22. Which of the following environmental indicators would you like to see improved? Please indicate no more three in order of importance (1,2,3)

… air … water … soil … noise

23. Please rate the following services/indicators at your workplace (1=very poor, 2=poor, 3=average, 4=good, 5=excellent)

a) Salary	□1	□ 2	□ 3	□ 4	□ 5
b) Workplace safety	□1	□ 2	□ 3	□ 4	□ 5
c) Training opportunities	□1	□ 2	□ 3	□ 4	□ 5
d) Career opportunities	□1	□ 2	□ 3	□ 4	□ 5
e) Job security	□1	□ 2	□ 3	□ 4	□ 5

24. How far do you commute to work?

□ less than 5 kilometers □ 5-10 kilometers □ 10-20 kilometers □ 20-50 kilometers □ more than 50 kilometers

25. How do you get to work?

□ motorcycle □ bicycle □ car □ bus □ carpooling □ on foot

26. Please estimate how you spend your monthly income in percentages

Accommodatiom……..% food/beverage……..% transportation……..% leisure……..% education……..% utilities……..%

27. How often do you use services that do not include travel at the airport? (e.g. shopping, taxis, banks/ATMs)

□ every day □ every week □ once a month □ a few times a year □ never

28. The airport is positive for my community.

□ strongly disagree □ disagree □ neither □ agree □ strongly agree

29. The airport provides income for my community.

□ strongly disagree □ disagree □ neither □ agree □ strongly agree

30. The airport creates new income opportunities for me

□ strongly disagree □ disagree □ neither □ agree □ strongly agree

31. The airport increase demand for my goods/services

□ strongly disagree □ disagree □ neither □ agree □ strongly agree

32. The presence of newcomers in your area has challenged your ability to find employment

□ there are no newcomers □ strongly disagree □ disagree □ neither □ agree □ strongly agree

33. What is the biggest obstacle to finding employment or another job in the area?

□ there are not enough jobs available □ the jobs that are available require higher education □ potential workplaces are too far away
□ I do not have friends/family that can offer me a job □ I cannot find a job due to my ethnicity □ I cannot find a job due to my gender

34. How would you rate your overall work experience?

□ very negative □ negative □ neither positive or negative □ positive □ very positive

35. How many people are dependent on your income?

□ Only myself □ 2 □ 3 □ 4 □ 5 or more

36. Do you participate in a micro loan scheme?

□ Yes □ No If yes, please state which provider and how you invest the money?

37. Are there any projects by/with the airport supporting local communities that you know of?

□ Yes □ No If yes, which?

PLEASE FILL IN BOTH SIDES

38. Do you feel that your livelihood is endangered by the airport?
□ Yes □ No If yes, why?

39. Have the prices for land/rent in your area of residence increased over the past 5 years?
□ Yes □ No □ If yes, what are the consequences?

40. Please check the box with the statement that applies to you
□ I have been living in this area all my life □ I moved here due to work □ I moved here because of my family □ other

41. Would you like further investments at the airport?
□ Yes □ No If no, why not?

42. Do you feel that local communities can influence decision-making processes at the airport?
□ Yes □ No

43. If you are not from Hanoi, please indicate which country/district in Vietnam do you come from

PLEASE FILL IN BOTH SIDES

Thôn: …… **Xã:** …… **Thời gian:** …… **giờ** …… **Ngày:** ……/……/**2012** ■ **HỌ và TÊN:** ……

Bảng câu hỏi: Phát triển Bền vững Sân bay Nội Bài, Hà Nội – Dân cư trong khu vực

Cuộc nghiên cứu, phỏng vấn và thu thập thông tin được thực hiện theo nguyên tắc rằng tất cả các câu trả lời được cung cấp trên cơ sở tự nguyện và bất cứ câu hỏi nào được coi là quá riêng tư có thể được bỏ qua. Bảng câu hỏi này là chỉ cho các mục đích nghiên cứu giáo dục và không có thông tin sẽ không được chia sẻ cho bên thứ ba. THÔNG TIN CỦA QUÝ VỊ CUNG CẤP SẼ ĐƯỢC ĐỂ VÔ DANH VÀ ĐƯỢC CAM KẾT BẢO MẬT TUYỆT ĐỐI

A. Thông tin cơ bản

1. Giới tính:

□ Nam □ Nữ

2. Độ tuổi:

□ 18-25 □ 26-33 □ 34-41 □ 42-49 □ 50- 59 □ 60+

3. Tình trạng hôn nhân:

□ Độc thân □ Đã kết hôn □ Li dị /Mất vợ/chồng

4. Số nhân khẩu trong nhà (các thành viên trong gia đình hoặc bạn cùng phòng):

□ 1 □ 2-4 □ 5-8 □ 8+

5. Trình độ học vấn (xin đánh dấu trình độ cao nhất ông/bà theo học):

□ Tiểu học □ Cấp hai □ Hoàn thành cấp 2 □ Cấp 3 □ Hoàn thành cấp 3 □ Đại học □ Thạc sĩ
□ Cao đẳng □ Trường dạy nghề □khác

6. Khả năng ngoại ngữ:

□ Tiếng Việt □ Tiếng Pháp □ Tiếng Trung □ Tiếng Anh □ khác

7. Quốc tịch:

□ Người Việt Nam □ Nước ngoài □ Dân tộc thiểu số

B. Phân tích Kinh tế

8. Tình trạng nghề nghiệp:

□ Tự làm chủ □ Đi làm thuê □ Làm cho gia đình (kinh doanh/nông nghiệp) □ thất nghiệp □ nghỉ hưu

9. Ông/Bà làm việc trong lĩnh vực nào

□ Nông nghiệp □ Dịch vụ □ Sản xuất □ Làm trong công ty nhà nước

10. Ông/bà có làm nhiều công việc để kiếm thu nhập không?Nếu có Xin liệt kê tất cả.

Công việc thứ 1: …… Công việc thứ 2: …… Công việc thứ 3: ……

11. Số giờ làm việc trong 1 tuần ?

Công việc thứ 1: …… Công việc thứ 2: …… Công việc thứ 3: ……

12. Với công việc mang lại thu nhập chính ông/bà đã làm được bao lâu?

□ 0-3 tháng □ 3 tháng - 1 năm □ 1 – 5 năm □ hơn 5 năm

13. Làm thế nào ông/bà tìm được công việc hiện tại?

□ Qua bạn bè □ Gia đình □ Môi giới □ Quảng cáo □ Trường học □ Nhân viên cũ □ khác

14. Nếu không đi làm, sau bao lâu thì khoản tiết kiệm của ông/bà sẽ hết?

□ ít hơn 1 tháng □ 1 tháng □ 2 tháng □ 3 tháng □ hơn 4 tháng

15. Ông/bà có đang sở hữu

□ Xe máy □ ô tô □ xe đạp □ chung cư □ nhà □ đất □ Gia súc/gia cầm □ máy tính

16. Ông/Bà có người nhà, bạn bè làm ở sân bay không?

□ Có □ Không

17. Thu nhập hàng tháng của ông/bà khoảng bao nhiêu (VND)?

□ 0-1 triệu □ 1 triệu– 2 triệu □ 2 triệu– 4 triệu □ 4 triệu– 10 triệu □ 10 triệu +

Xin vui lòng điền tiếp mặt sau

18. Sau khi thanh toán các khoản chi phí sinh hoạt (tiền thuê nhà, điện, nước, xăng xe) ông/bà còn tiết kiệm được bao nhiêu ?

□ 0-1 triệu □ 1 triệu– 2 triệu □ 2 triệu– 4 triệu □ 4 triệu– 10 triệu □ 10 triệu +

C. Phân tích xã hội

19. Đánh giá các chỉ số về dịch vụ trong khu vực ông/bà sinh sống theo thang điểm (1=rất tệ, 2=tệ, 3=trung bình, 4=tốt, 5=rất tốt)

a) Cấp nước sạch	□1	□ 2	□ 3	□ 4	□ 5
b) Đường xá	□1	□ 2	□ 3	□ 4	□ 5
c) Điện	□1	□ 2	□ 3	□ 4	□ 5
d) Vệ sinh môi trường	□1	□ 2	□ 3	□ 4	□ 5
e) Phương tiện công cộng	□1	□ 2	□ 3	□ 4	□ 5
f) Chính sách	□1	□ 2	□ 3	□ 4	□ 5
g) Giáo dục	□1	□ 2	□ 3	□ 4	□ 5
h) Y tế	□1	□ 2	□ 3	□ 4	□ 5
i) Internet	□1	□ 2	□ 3	□ 4	□ 5

20. Dịch vụ nào sau đây ông/bà muốn được cải thiện? Chỉ đánh giá 3 mục quan trọng nhất (theo thứ tự 1,2,3)

….. Cấp nước sạch …..Đường xá ….. Điện …..Vệ sinh môi trường …..Phương tiện công cộng

…..Chính sách ….. Giáo dục …..Y tế …..internet …. Khác:……

21. Đánh giá các chỉ số về môi trường theo thang điểm (1=rất tệ, 2=tệ, 3=trung bình, 4=tốt, 5=rất tốt)

a) Không khí	□1	□ 2	□ 3	□ 4	□ 5
b) Nước	□1	□ 2	□ 3	□ 4	□ 5
c) Đất đai	□1	□ 2	□ 3	□ 4	□ 5
d) Tiếng ồn	□1	□ 2	□ 3	□ 4	□ 5

22. Tiêu chí môi trường nào dưới đây ông/bà muốn được cải thiện? Chỉ đánh giá 3 mục quan trọng nhất (theo thứ tự 1,2,3)

….. Không khí ….. Nguồn nước ….. Đất đai ….. Tiếng ồn

23. Xin hãy đánh giá các dịch vụ hoặc chỉ tiêu sau đây về nơi ông/bà làm việc (1=rất thấp, 2=thấp, 3=trung bình, 4=cao, 5=rất cao)

a) Lương	□1	□ 2	□ 3	□ 4	□ 5
b) An toàn lao động	□1	□ 2	□ 3	□ 4	□ 5
c) Cơ hội được đào tạo	□1	□ 2	□ 3	□ 4	□ 5
d) Cơ hội thăng tiến	□1	□ 2	□ 3	□ 4	□ 5
e) Cơ hội làm việc lâu dài	□1	□ 2	□ 3	□ 4	□ 5

24. Ông/Bà đi làm bao xa?

□ ít hơn 5 km □ 5-10 km □ 10-20 km □ 20-50 km □ hơn 50 km

25. Ông/ Bà đi làm bằng phương tiện gì ?

□ xe máy □ xe đạp □ ô tô □ xe buýt □ đi cùng người khác □ đi bộ

26. Xin đánh giá theo phần trăm (%) số tiền ông bà sử dụng cho các khoản sau:

Chỗ ở: …….(%) Thực phẩm/ Thức ăn: ……. (%) Đi lại: ……. (%)

Giải trí, sở thích: ……. (%) Giáo dục: ……. (%) Các chi phí khác: ……. (%)

27. Ông/Bà có thường xuyên sử dụng các dịch vụ trong sân bay không? (ví dụ mua sắm, ta-xi, ngân hàng/ rút tiền ATM)

□ Hàng ngày □ Hàng tuần □ Một lần một tháng □ Một vài lần trong năm □ Chưa bao giờ

28. Ông/Bà có nghĩ sân bay có tác động tốt đến cộng đồng dân cư không?

□ Hoàn toàn không đồng ý □ Không đồng ý □ bình thường □ đồng ý □ hoàn toàn đồng ý

Xin vui lòng điền tiếp mặt sau

29. Ông/Bà có nghĩ sân bay tạo ra nguồn thu nhập cho cộng đồng dân cư không

□ Hoàn toàn không đồng ý □ Không đồng ý □ bình thường □ đồng ý □ hoàn toàn đồng ý

30. Ông/Bà có nghĩ sân bay tạo ra cơ hội kiếm thêm thu nhập mới cho ông/bà không?

□ Hoàn toàn không đồng ý □ Không đồng ý □ bình thường □ đồng ý □ hoàn toàn đồng ý

31. Ông/Bà có nghĩ sân bay làm ông/bà bán sản phẩm/ dịch vụ của mình tốt hơn không?

□ Hoàn toàn không đồng ý □ Không đồng ý □ bình thường □ đồng ý □ hoàn toàn đồng ý

32. Những người mới nhập cư đến đây có làm ông/bà thấy khó khăn hơn trong việc tìm việc làm hay trong công việc kinh doanh không?

□ Không có ai mới đến cả □ Hoàn toàn không đồng ý □ Không đồng ý □ bình thường
□ đồng ý □ hoàn toàn đồng ý

33.Khó khăn lớn nhất khi muốn tìm một việc làm khác trong khu vực này là gì?

□ Không có đủ việc làm □ các công việc khác đòi hỏi trình độ cao hơn
□ những nơi làm việc khác ở quá xa □ Không có bạn/người thân có thể giới thiệu công việc
□ Không tìm được việc do là người dân tộc □ Không tìm được việc do giới tính không phù hợp

34. Ông/Bà có thấy hài lòng với công việc hiện tại của mình không?

□ rất tệ □ tệ □ bình thường □ tốt □ rất tốt

35. Bao nhiêu người phụ thuộc vào thu nhập của ông/bà?

□ Một mình tôi □ 2 □ 3 □ 4 □ 5 hoặc hơn

36. Ông/Bà có tham gia chương trình cho hộ gia đình vay vốn nào không?

□ Có □ Không Nếu có xin nêu tổ chức/người cho vay và ông/bà sử dụng tiền làm gì?

……

37. Ông/Bà có biết dự án nào của huyện nhà hoặc do huyện liên kết cùng với sân bay để hỗ trợ dân cư địa phương?

□ Có □ Không Nếu có, xin nêu tên dự án: ……..

38. Ông/Bà có cảm thấy khu vực mình sinh sống an toàn hơn vì gần sân bay?

□ Có □ Không Nếu có, vì sao? ……

39. Giá đất/ thuê nhà ở trong khu vực có tăng lên trong 5 năm gần đây không?

□ Có □ Không Nếu có, nó ảnh hưởng đến cuộc sống của ông/bà như thế nào?

……..

40. Hãy lựa chọn đáp án ông/bà cảm thấy đúng nhất dưới đây:

□ Tôi sinh ra và lớn lên ở khu vực này □ Tôi chuyển đến đây vì công việc □ Tôi chuyển đến đây cùng gia đình
□ khác

41. Ông/Bà có muốn có thêm đầu tư vào sân bay? Ông/bà có nghĩ nên đầu tư thêm để phát triển sân bay không?

□ Có □ Không Nếu không, tại sao? ……

42. Ông/Bà có nghĩ rằng ý kiến củangười dân sống trong vùng có ảnh hưởng đến nhữngquyết định của Ban Quản Lýsân bay không?

□ Có □ Không

43. Nếu không phải là người Hà Nội vậy bạn đến từ địa phương nào của Việt Nam?

Xin vui lòng điền tiếp mặt sau

Bảng câu hỏi: Phát triển Bền vững Sân bay Nội Bài, Hà Nội

A. Thông tin cơ bản

1. Giới tính:
□ Nam □ Nữ

2. Độ tuổi:
□ 18-25 □ 26-33 □ 34-41 □ 42-49 □ 50- 59 □ 60+

3. Tình trạng hôn nhân:
□ Độc thân □ Đã kết hôn □ Li dị /Mất vợ/chồng

4. Số nhân khẩu trong nhà (các thành viên trong gia đình hoặc bạn cùng phòng):
□ 1 □ 2-4 □ 5-8 □ 8+

5. Trình độ học vấn (xin đánh dấu trình độ cao nhất anh/chị theo học):
□ Tiểu học □ Cấp hai □ Hoàn thành cấp 2 □ Cấp 3 □ Hoàn thành cấp 3 □ Đại học □ Thạc sĩ
□ Cao đẳng □ Trường dạy nghề □khác

6. Khả năng ngoại ngữ:
□ Tiếng Việt □ Tiếng Pháp □ Tiếng Trung □ Tiếng Anh □ khác

7. Quốc tịch:
□ Người Việt Nam □ Nước ngoài □ Dân tộc thiểu số

B. Phân tích kinh tế

8. Anh/Chị làm ở mạng dịch vụ nào của sân bay?
□ Liên quan đến hành khách □ An ninh sân bay □ Quản lý chuyến bay
□ Điều khiển không lưu □ Phục vụ mặt đất □ Khác

9. Công việc của anh/chị tại sân bay là gì?
.....

10. Anh/Chị có công việc làm thêm nào không?
□ Có □ Không Nếu có, đó là việc gì? .....

11. Số giờ làm việc trong 1 tuần ?
Công việc thứ 1: ..... Công việc thứ 2: ..... Công việc thứ 3: .....

12. Anh/Chị đã làm việc tại sân bay được bao lâu ?
□ 0-3 tháng □ 3 tháng - 1 năm □ 1 - 5 năm □ hơn5 năm

13. Anh/chị đã làm một loại công việc ở sân bay được bao lâu?
□ 0-3 tháng □ 3 tháng - 1 năm □ 1 - 5 năm □ hơn 5 năm

14. Anh/Chị là nhân viên trực tiếp của sân bay hay làm việc cho các công ty/cửa hàng tại sân bay?
□ nhân viên trực tiếp □ công ty/ cửa hàng ngoài

15. Làm sao anh/chị tìm được công việc hiện tại?
□ Bạn bè □Gia đình □ Môi giới □ Quảng cáo □ Trường học □ nhân viên cũ □ khác

16. Lý do chính bạn tìm việc tại sân bay là gì?
□ mức lương □ thử thách trong công việc □ Không còn việc khác
□ Cơ hội được đào tạo nghề □ môi trường công việc

17. Anh/Chị có người thân làm việc tại sân bay không?
□ Có □ Không Nếu có, xin nêu tên công việc:.....

18. Khó khăn lớn nhất để tìm việc làm hay công việc khác tại sân bay là gì?
□ Không đủ cơ hội nghề nghiệp □ các công việc đòi hỏi trình độ cao hơn
□ những chỗ làm việc tiềm năng quá xa □ Không có bạn/người thân có thể giới thiệu công việc
□ Không tìm được việc do là người dân tộc □ Không tìm được do giới tính không phù hợp

19. Nếu không đi làm, sau bao lâu thì khoản tiết kiệm của anh/chị sẽ hết?
□ ít hơn 1 tháng □ 1 tháng □ 2 tháng □ 3 tháng □ hơn 4 tháng

20. Anh/chị có đang sở hữu
□ Xe máy □ ô tô □ xe đạp □ chung cư □ nhà □ đất □ Gia súc/gia cầm □ máy tính

Xin mời sang trang

21. Thu nhập hàng tháng của anh/chị khoảng bao nhiêu (VND)?

□ 0-1 triệu □ 1 triệu– 2 triệu □ 2 triệu– 4 triệu □ 4 triệu– 10 triệu □ 10 triệu +

22. Sau khi thanh toán các khoản chi phí sinh hoạt (thuê nhà, điện, nước, xăng xe) anh/chị còn tiết kiệm được bao nhiêu?

□ 0-1 triệu □ 1 triệu – 2 triệu □ 2 triệu – 4 triệu □ 4 triệu – 10 triệu □ 10 triệu+

C. Phân tích xã hội

23. Đánh giá các chỉ số theo thang điểm mà anh/chị cho là đúng với điều kiện làm việc của mình (1=rất thấp, 2=thấp, 3=trung bình, 4=cao, 5=rất cao)

a) Thu nhập	□1	□ 2	□ 3	□ 4	□ 5
b) An toàn lao động	□1	□ 2	□ 3	□ 4	□ 5
c) Cơ hội đào tạo	□1	□ 2	□ 3	□ 4	□ 5
d) Cơ hội nghề nghiệp	□1	□ 2	□ 3	□ 4	□ 5
e) Cơ hội làm việc lâu dài	□1	□ 2	□ 3	□ 4	□ 5

24. Điều kiện làm việc nào anh/chị muốn được cải thiện? Chỉ đánh giá 3 mục quan trọng nhất (1, 2, 3)

…..Thu nhập ….. An toàn lao động ….. Cơ hội đào tạo ….. Cơ hội nghề nghiệp ….. Cơ hội làm việc lâu dài

25. Anh/Chị có thấy hài lòng với công việc của mình hiện tại không?

□ rất tệ □ tệ □ bình thường □ tốt □ rất tốt

26. Có cơ hội đào tạo nghề nào được sân bay đầu tư cho nhân viên không?

□ Có □ Không Nếu Có, đó là gì?.....

27. Anh/chị có thường xuyên sử dụng các dịch vụ trong sân bay không? (ví dụ: mua sắm, ta-xi, ngân hàng, ATM)

□ Hàng ngày □ Hàng tuần □ Một lần một tháng □ Vài lần một năm □ Không bao giờ

28. Anh/chị nghĩ mình có được hưởng thêm lợi ích gì từ sân bay không?

□ nhà ở □ thuốc than, khám bệnh □ Giáo dục/ đào tạo □ hỗ trợ phương tiện đi lại □ Không có gì

29. Anh/chị có muốn sân bay được đầu tư thêm không? □ Có □ Không

30. Bao nhiêu người phụ thuộc vào thu nhập của anh/chị?

□ Một mình tôi □ 2 □ 3 □ 4 □ 5 hoặc hơn

31. Anh/chi đi làm bao xa?

□ ít hơn 5 km □ 5-10 km □ 10-20 km □ 20-50 km □ hơn 50 km

32. Anh/chị đi làm bằng phương tiện gì ?

□ xe máy □ xe đạp □ ô tô □ xe buýt □ đi cùng người khác □ đi bộ

33. Công việc hiện tại đúng với ngành nghề anh/chị đã học.

□ Hoàn toàn không đồng ý □ Không đồng ý □ bình thường □ đồng ý □ hoàn toàn đồng ý

34. Tất cả các nhân viên đều được đối xử công bằng ở sân bay

□ Hoàn toàn không đồng ý □ Không đồng ý □ bình thường □ đồng ý □ hoàn toàn đồng ý

35.Giá đất/ thuê nhà ở trong khu vực anh/chị sống có tăng lên trong 5 năm gần đây không?

□ Có □ Không

Nếu có, nó ảnh hưởng đến cuộc sống của anh/chị như thế nào?.....

36. Xin đánh giá theo phần trăm (%) thu nhập hàng tháng anh/chị sử dụng cho các khoản sau:

Chỗ ở ……. (%) Thực phẩm …… (%) Đi lại ……. (%) Giải trí ……. (%)

Giáo dục …… (%) Chi phí sinh hoạt khác …… (%)

37. Hãy tích vào ô mà anh/chị cảm thấy đúng nhất

□ Tôi sinh ra và lớn lên ở Hà Nội □ Tôi dời đến đây vì công việc □ Tôi dời đến đây cùng gia đình □ khác

38. Xin ghi rõ tên quốc gia hay tỉnh/thành phố ở Việt Nam nơi anh/chị sinh ra.

……

Xin mời sang trang