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# POPULATION, NATURAL RESOURCES & DEVELOPMENT IN THE MEKONG: DOES HIGH POPULATION DENSITY HINDER DEVELOPMENT?

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*High population density is often considered to be among the biggest hindrances for development, particularly in areas where people depend on natural resources for their livelihoods. The reality is, however, more complicated. The cases presented from the Tonle Sap area and the Mekong Delta show that the drivers for areas' development can be very different from population density, and in some cases higher population density can be seen to be beneficial for development. This finding highlights the need for more thorough understanding of the wider socio-political and historical context where development and resource use takes place.*

## 1 Introduction

Population growth and resulting higher population density is often argued to lead to increased stress on water and natural resources, decreased food security, slower development and, consequently, to poverty. This is also the view in many Mekong countries, as highlighted by their population policies and strategies (see e.g. The Socialist Republic of Vietnam, 2003; MRC, 2003a; RGC, 2002). It is indeed obvious that more people relying on same natural resource base put these resources under increasing pressure. As a result

there are fewer resources available per person, which is likely to impact negatively both food insecurity and social and economic development of the area.

The relationship between population, natural resources and development is, however, more complex, and it seems that many population strategies partly ignore the importance of other environmental, social, economic and political issues impacting development. The more positive aspects related to population density are also easily forgotten: higher population density means higher human capital and therefore a possibility for greater ingenuity and adaptation.

This Chapter looks at the interconnections between population, natural resources and

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development through case studies from the Tonle Sap area of Cambodia and the Mekong Delta of Vietnam. The case studies are presented with the help of population theories, historical reviews and analyses of population indicators and livelihood structures. To keep its focus, the Chapter does not tackle some other important issues related to population and development, such as the multi-dimensional aspects of poverty (for more on this see e.g. Laderchi *et al.*, 2003). The focus is on rural areas, since the extremely important issue of urbanisation and migration has already been well addressed in several other studies (see e.g. Deshingkar, 2006; Jack, 2006; Heinonen, 2006; Guest, 1998; Drakakis-Smith and Dixon, 1997).

### 1.1 Three theories on population and development

The relationship between population and development has puzzled policy makers, economists and demographers for centuries. Perhaps the most challenging is that the impacts between the two go both ways: demographic structures have far-reaching environmental, social and economic implications, while environmental, social and economic processes and changes have extensive demographic consequences (Kuznets, 1998). Different studies during different periods of time have suggested that population growth –and resulting higher population density– either restricts, promotes, or is independent of economic growth. Following from these, Bloom *et al.* (2003) define three main theories: 1) Pessimistic Theory, 2) Optimistic Theory, and 3) Neutralist Theory.

The underlining principle behind *Pessimistic Theory* is that higher population density puts natural resources under increasing stress and thus restricts economic and social growth. This principle can be traced back to Thomas Malthus who theorized already in 18<sup>th</sup> Century that in a (agrarian) world with fixed resources and slow technical progress, higher population densities would lead to insufficient food production. This will have a negative impact on overall development as a remarkable part of investments

and resources must be used to supply the needs of larger population, and not for enabling an increase in the level of provision per capita (Bloom *et al.*, 2003).

During the past few decades, the Pessimistic Theory have largely given way to so-called *Optimistic Theory* that believes that population growth and resulting higher population density actually fuels economic growth and development. Higher population density should therefore be seen as an economic asset rather than a threat. The fundamental change in opinion is largely based on empirical analysis: during the last 30 years the world's population has doubled and population densities increased dramatically and yet also the average per capita incomes have increased by about two-thirds (Bloom *et al.*, 2003).

The Optimistic Theory gives more importance on to technological progress and accumulation of human resource base (“human capital”) than to physical and natural capital. Optimists believe that as population increases, so does the stock of human ingenuity to solve practical technical, social, economic and environmental problems (Homer-Dixon, 1999). Larger societies that have a capacity to take an advantage of economies of scales are therefore better positioned to develop and utilise the increased level of knowledge they receive (Kuznets, 1967 in Bloom *et al.*, 2003). Optimistic Theory thus turns Malthusian worldview around: population growth indeed creates pressure on limited resources, but people are resourceful and are stimulated to innovate particularly in adversity.

The last one of three theories, so-called *Neutralist Theory*, sees that higher population density has no significant, direct effect on development. This view is based on the statistical analyses of the correlation between population and economic growth in different countries. There are usually relatively clear indicators that countries with rapidly growing population tend to have more slowly growing economies. However, this negative correlation often disappears when other critical factors such as size of the country, trade policies,

educational level and governance system are taken into account as well (Bloom *et al.*, 2003).

Neutralist and Optimistic Theories thus concentrate more on long-term impacts of higher population density to development<sup>1</sup>. Both theories thus take a broader and more multifaceted view on the relationship between population, natural resources and development, arguing that there is a multiplicity of population-related factors that can have positive but also negative impacts on development (Bloom *et al.*, 2003).

## 1.2 Demographic changes

Demography is not static in any country or area; the relative proportions of different age cohorts change as birth and mortality rates vary over the years. One of the most dominant demographic changes globally is so-called demographic transition that results from decrease in number of young people and increase in number of old. This demographic transition has over the past decades been dramatic in many countries of the world, including Asia (Hussain *et al.*, 2006).

While demographic transition has profound implications for planning of the social services, it can also give a positive boost for countries'

development as relatively more people will be in the adult age groups who comprise the productive labour force (Ross, 2004). Unfortunately this situation does not last forever; few decades later the age distribution changes again as large adult population moves into the older age groups and is followed by the smaller cohorts of younger people. When this occurs, so-called dependency ratio rises again: only this time it is due to the need to care for the elderly than for the young (Ross, 2004). The demographic transition can thus see to open only a limited window of opportunity for countries' development.

When looking at the current demographic situation in the Mekong countries, it can be noted that in most South-East Asian countries –including Vietnam– the growth rates of the proportion of young people (0-14 years) from total population are currently zero or even negative, indicating reducing fertility rates (Hussain *et al.*, 2006). In the case of Cambodia, however, the growth rate of youngest cohort is still strongly positive, despite the fact that the proportion of young people is at 43% already now extraordinarily high (Table 1).

Population projections thus indicate that Vietnam is, together with several other Asian countries, already going through a dramatic demographic

Table 1 Comparison of key population indicators between Vietnam and Cambodia.

	Cambodia	Vietnam
Population, total (mid-2004)	14 482 000	82 481 000
Annual population growth (2004)	2,4 %	1,3 %
Av. population density [people/km <sup>2</sup> ] (2004)	80,0	248,7
Av. population density [people/km <sup>2</sup> ] (1965)	34,3	93,3
Proportion of 0-14 years	43%	32%
Proportion of 15-64 years	54%	63%
Proportion of 65+ years	3%	5%
Annual growth rate of 0-14 years	1,4 %	-1,4 %
Annual growth rate of 15-64 years	3,2 %	2,6 %
Annual growth rate of 65+ years	2,5 %	1,4 %

Source: The Far East and Australasia (2004), United Nations (1968)

transition. This transition links to sharp decline in population growth rate in 1990s, when growth rate drop from almost 2% in 1990 to 1,4% in 2000 (National Committee for Population and Family Planning, 2002). Cambodia's population structure, on the other hand, continues to be dominated by youngest age cohorts. High positive growth rates particularly in the dependent age groups i.e. young and elderly can be seen to form a burden for a country as poor as Cambodia. On the other hand the increase of economically active population (as younger age cohorts enter the work force) can provide a window of opportunity for country's development – assuming that there exist broader social and economic context that supports it.

## 2 Two unique case studies from the Mekong Basin

This Chapter looks at two closely situated but very differently developed areas in the Mekong Basin: the Tonle Sap Lake of Cambodia and the Mekong Delta of Vietnam (Figure 1). Both areas are unusual in terms of hydrology: while Tonle Sap has its extraordinary flood regime, the Mekong Delta possesses the diverse characteristics of deltas including floods, saline water intrusion and strong tides.

In both areas people have developed different methods for adapting—and making use of—the hydrological regime. While in the Tonle Sap the

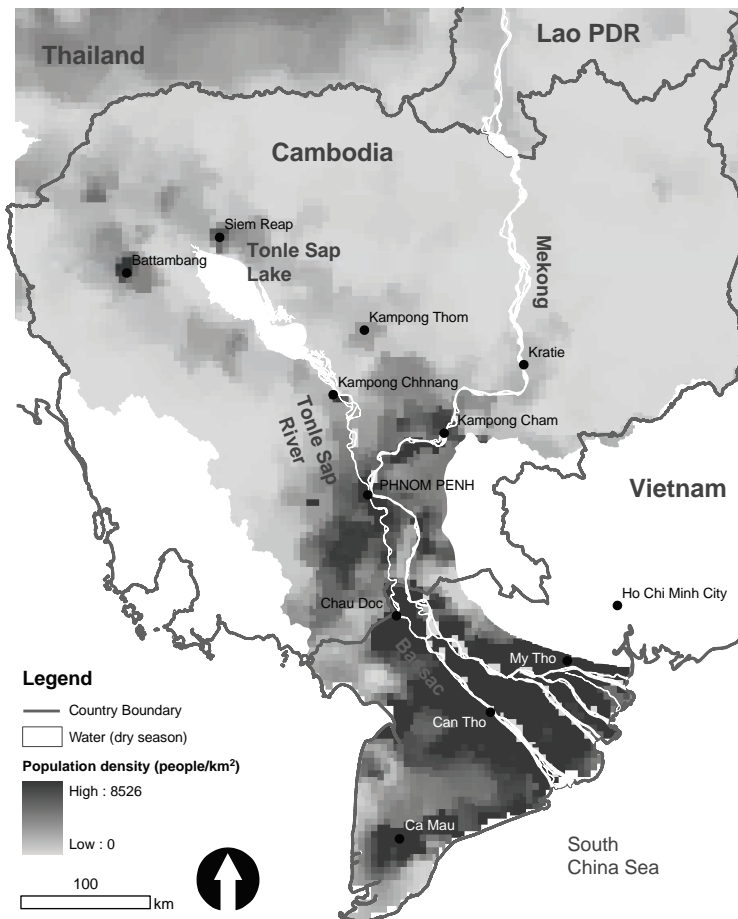


Figure 1 The Tonle Sap Lake and the Mekong Delta together with the population densities in the areas (population data shown only for the Mekong Basin). (Map by Matti Kummu)

people are still adapted to natural water regime, in the Delta this decades-long “adaptation” has actually meant ambitious engineering projects that have resulted in a move from adaptation to control of delta’s water regime (Käkönen, 2008; Biggs, 2003; Miller, 2003).

The most important livelihoods in these two areas are similar and closely linked with water: in both areas rice cultivation and other agricultural activities combined with fishing and/or aquaculture form the most important livelihood sources. In spite of these similarities, there are stunning differences in the population density and level of development between the two areas (Table 2). While the total population of the six provinces surrounding Tonle Sap Lake is around four million with average population density of mere 56 persons/km<sup>2</sup>, the average population density in the Mekong Delta is 416 persons/km<sup>2</sup> (The Far East and Australasia, 2004).

Yet, despite its high population density, the Mekong Delta of Vietnam has been able to

develop into extremely productive rice cultivation and aquaculture area, and its economy—together with the entire country—has been growing rapidly during the past decade. People living in the delta are currently considered to have higher income than anywhere else in the Lower Mekong Basin, although the relative poverty rates<sup>2</sup> in the delta’s provinces are around the same level than the ones e.g. in Cambodia and Thailand (Chaudhry & Juntopas, 2005; MRC, 2003a).

At the same time much less densely populated Tonle Sap area remains as one of the poorest areas in the entire Mekong Basin. Similarly to the delta, people living in the villages of Tonle Sap are deeply dependent on rice and fish. But in the Tonle Sap the average rice yield is considerably less (around 2 t/ha) than in the delta (3-5 t/ha), and in most areas people cultivate just one rice crop per year compared to two and three crops cultivated in the delta (MRC, 2003b). In addition, due to so-called fishing lot system based on private fishing concessions, villagers can utilise lake’s immense aquatic resources only to limited extent. While in

Table 2 Comparison of key poverty and population indicators between Vietnam and Cambodia.

		Cambodia	Vietnam	East Asia & Pacific / South-East Asia
World Bank Datasheets	Surface area (km <sup>2</sup> )	181 000	331 700	
	Population, total (2004)	13 600 000	82 200 000	1 870 000 000
	Av. population density (people/km <sup>2</sup> )	75,1	247,8	
	Urban population (% of total population)	19,0 %	26,0 %	41,0 %
	Annual population growth (2004)	1,7 %	1,0 %	-
	Av. population growth (98-04)	1,9 %	1,2 %	0,9 %
UNFPA	Av. labour force growth (98-04)	2,4 %	2,4 %	1,1 %
	Av. population growth rate (2005-10)	2,0 %	1,3 %	1,2 %
	Urban growth rate (2005-10)	4,9 %	3,0 %	3,0 %
World Bank Datasheets	Population / ha of arable land	2,5	6,0	-
	GNI per capita (Atlas method, US\$)	\$350	\$540	\$1 280
	Annual GDP growth (2004)	6,0 %	7,5 %	-
	Poverty (% below poverty line)	36,0 %	29,0 %	-
	Literacy (% of population age 15+)	74,0 %	90,0 %	90,0 %
	Life expectancy at birth (years)	54	70	70
	Fertility rate / births per woman (2003)	3,9	1,9	-

Source: World Bank Datasheets for 2004, UNFPA (2006); East Asia & Pacific = World Bank, South-East Asia = UNFPA

Vietnam the GDP doubled during the 1990s and the proportion of the poor population dropped from just under 60 percent to around 30 percent, in Cambodia the proportion of population living under national poverty rate has stayed rather stable, reducing during 1990s just three percentage points from 39 percent to 36 percent (MRC, 2003a).

The question thus raises; why is the Mekong Delta -despite its much higher population density and similarly challenging environmental conditions- so much more prosperous than the Tonle Sap? And what have been the main reasons for different paces of development in these two regions? Following chapters try to shed light on these questions.

### 3 Tonle Sap Lake – Low population density with persistent poverty

Cambodia is together with Laos the poorest of the Lower Mekong countries. The country's Gross National Income (GNI) per capita in 2006 was mere 480US\$. When compared to its neighbours, this means 70% of Vietnam's GNI, 16% of Thailand's GNI and 96% of Laos' GNI (World Bank, 2007). Most of the population, including the population living in the Tonle Sap area, is still heavily dependent on natural resources for their livelihood, and more than 70% of the labour force works in the agricultural sector (NIS, 2004).

Although the country's economy has been growing relatively fast during past decade, the development has not been equal. Particularly disparities between urban and rural areas are growing rapidly (Ministry of Planning, 2002). Several decades of internal turmoil, poor management of natural resources, and weak and corrupted governance are considered to be the main reasons for the underdevelopment of the country (World Bank, 2004).

#### 3.1 Historical background – From a prosperous country to a battlefield

The prospects for economic and social development for Cambodia were after the independence i.e. in the 1950s very promising, and in many ways better than for neighbouring Vietnam. Cambodia possessed stable food supplies, and its trade balance was good as the country was able to export its agricultural surpluses such as rice and fish. Also exports of rubber and timber contributed for economic growth (The Far East and Australasia, 2004; United Nations, 1968).

The immense natural resources of the Tonle Sap Lake were recognised also that time, and they formed an important source of income and food<sup>4</sup>. During the 1960s the Cambodian government invested—with foreign support—in economic development and particularly in industrialization

Table 3 Population densities in the provinces of Tonle Sap.

TONLE SAP	Area (km <sup>2</sup> )	Population in 2001	Population density (persons/km <sup>2</sup> )
Banteay Meanchey	6 679	703 356	105,3
Battambang	11 702	949 614	81,1
Kampong Chhnang	5 521	476 556	86,3
Kampong Thom	13 814	642 932	46,5
Pursat	12 692	418 303	33,0
Siem Reap	10 299	798 546	77,5
Tonle Sap provinces total	60 707	3 989 307	65,7
Tonle Sap Area (between National Roads 5 & 6)	14 876	1 186 192 (in 1998)	79,7

Sources: The Far East and Australasia (2004), Keskinen (2003)

aiming to increase country's self-sufficiency (The Far East and Australasia, 2004). The promising economic development got, however, halted already in the late 1960s with the political problems and following economic stagnation of the country. These were partly influenced by Vietnam War that destabilised also Cambodia's economy (Chandler, 1998).

The 1970s was dominated by internal turmoil that was culminated with the launch of civil war by Cambodian communists, the Khmer Rouge, against the government. The civil war ended with the takeover of the Khmer Rouge in April 1975. This plunged the country into the chaos and misrule that no one was able to predict. The Khmer Rouge regime, lead by infamous Pol Pot, adapted a policy of self-reliance, cutting practically all connections to the outside world and international organisations (Browder & Ortolano, 2000). Cambodia's economic and social development was fully halted as the Khmer Rouge regime implemented its peculiar way of communism – and as a result destroyed large parts of the country's physical and human resources. Khmer Rouge repressed particularly the educated and urban class that were either killed or fled abroad (Chandler, 1998).

Although the Khmer Rouge regime was ousted in 1979 with political and military support from Vietnam, the situation in the country remained unstable till the early 1990s. Fighting and unrest continued particularly close to border areas with Thailand, including the areas around the Tonle Sap Lake. Consequently, it has been only past decade or so that the country, and the Tonle Sap area, has been able to develop in a relative peace. Even today, Cambodia remains as one of the most aid-dependent countries in the world. Although country's education system is slowly recovering, the challenges with human resources continue to be immense.

### 3.2 Population indicators

The total population of the six provinces surrounding Tonle Sap Lake was in 2001 around

four million, with average population density of 66 persons/km<sup>2</sup>. The population density of the Tonle Sap area i.e. Tonle Sap Lake and its floodplains is at 80 persons/km<sup>2</sup> somewhat higher (Table 3). Both figures are clearly lower than the average population density for the Mekong Delta. At the same time, however, Cambodia's annual population growth is among the highest in Asia, with estimations for current growth rates varying from 2,0% (World Bank, 2007) up to 2,4% (The Far East and Australasia, 2004). The population in the Tonle Sap area is estimated to grow even faster than national average with an annual growth rate of nearly 2,4% (NIS, 2000). Like in almost everywhere else in the world, urban population is growing faster than the rural population: the urban growth is further accelerated by the remarkable migration from rural to urban areas (Heinonen, 2006).

It must be noted that the figures based on average population density rarely present the actual population density on the ground. This is particularly true in the Tonle Sap area, where huge variation of lake's water level has pushed most of the people to live along the rivers and National Roads. The actual population density is thus much higher than the average figures indicate. Same applies to the floating villages of Tonle Sap that are concentrated to relatively small areas around the lakes and its tributaries. The situation is, however, somewhat similar in the Mekong Delta where the population is also concentrated mainly along the rivers and canals.

### 3.3 Tonle Sap's livelihood structure

The livelihoods of the people living around the Tonle Sap are closely linked with lake's extraordinary hydrological regime and area's diverse natural resources. The Tonle Sap Lake is among the most productive freshwater ecosystems in the world, and it is approximated that as much as half of the country's population benefits directly or indirectly from lake's resources (Bonheur 2001).

Yet, despite the immense natural resources of the lake and its floodplains, most of the people living



in the Tonle Sap area are poorer than the national average. Altogether around 1.2 million people live around the lake and its floodplain. This area can be divided into three livelihood zones: fishing zone, agricultural zone and urban zone (Keskinen, 2003). People in the fishing zone are directly dependent on fish and other aquatic resources and they live closest to the lake, either in the floating houses or houses built on stilts. People in this zone are in many ways worse off than people living in the higher areas, as they are on average the poorest, least educated and have poorest access to services and markets.

People living further away from the lake rely largely on rice cultivation for their livelihood. However, the importance of the lake and its floods is still significant particularly for cultivation of floating and recession rice as well as for seasonal fishing activities. In urban zone the dependence on natural resources is much lower and the occupational structure totally different: the main source of livelihood is more varied, while the involvement in secondary occupations is significantly less than in the rural areas (Keskinen, 2003).

The reasons for the lack of development in the Tonle Sap area are naturally manifold, but among

the most important ones can be seen to be the difficult history of the entire country, weak and corrupted governance system, unequal access to land and natural resources as well as misuse of the area's natural resources (Keskinen, 2006).

#### 4 Mekong delta - High population density with prosperity

The Mekong Delta is the most southern region in Vietnam, and due to its huge rice production capacity it is often dubbed as the rice basket of Vietnam. The delta covers in Vietnamese side an area of around 39 700 km<sup>2</sup> and extends over 13 Vietnamese provinces (SIWRP and VNMC, 2003). The hydrological characteristics differ greatly in different parts of the delta: while the upper part is characterised by flooding, lower parts are dominated by close interaction with the sea, including strong tides and saline water intrusion.

The Mekong Delta is one of Vietnam's most populated region and the largest agricultural area in term of agricultural production. In this way the Delta symbolises the Vietnam success story in agricultural growth. At the same time, however, the delta also highlights the limits of agricultural development: despite economic growth and

Table 4. Population densities in the provinces of Mekong Delta.

MEKONG DELTA	Area (km <sup>2</sup> )	Population in 2001	Population density (persons/km <sup>2</sup> )
Long An	4 492	1 348 000	300,1
Dong Thap	3 238	1 593 000	492,0
An Giang	3 406	2 099 000	616,3
Tien Giang	2 367	1 636 000	691,2
Ben Tre	2 316	1 308 000	564,8
Vinh Long	1 475	1 023 000	693,6
Tra Vinh	2 215	989 000	446,5
Can Tho	2 986	1 852 000	620,2
Soc Trang	3 223	1 213 000	376,4
Kien Giang	6 269	1 543 000	246,1
Bac Lieu	2 524	757 000	299,9
Ca Mau	5 195	1 158 000	222,9
Mekong Delta provinces total	39 706	16 519 000	416,0

Sources: The Far East and Australasia (2004)

development, the Delta remains among the poorest regions of the country, ranking third in national poverty statistics (French Embassy in Socialist Republic of Vietnam, 2004). The economic growth has thus not lead to successful poverty reduction, and disparities in the area have been growing.

#### 4.1 Historical background - From adaptation to control

Due to its intensive canal and embankment network, the Mekong Delta is hydrologically perhaps the most controlled area in the Mekong Basin. Typical to all deltas, its flat landscape is strongly influenced and shaped by water, both through natural water cycle and by human efforts to modify and control water regime for its own needs (Miller, 2003).

The efforts to adapt to, and gain control of, the delta's water regime started through different kinds of land reclamation project already centuries ago (Le Coq *et al.*, 2001). These efforts were intensified during the French colonial period. Between the late 19<sup>th</sup> Century and mid-20<sup>th</sup> Century, the French developed and modified the infrastructure and particularly hydraulic structures in the delta through various public works programs, having a profound impact on delta's hydrology, ecology and society (Biggs, 2003; Miller, 2003).

The period from the end of French colonial rule in 1954 till the end of the Second Indochina War in 1975 was politically and socially tumultuous in the entire country. In the delta the period meant re-organisation of old social structure, and further intensification in rice cultivation. This was done particularly through land reforms and introduction of high-yielding rice varieties. While the Second Indochina War left the entire country devastated and country's agricultural production stagnated, the agricultural production of the Mekong Delta was more efficient than in the other parts of the country (Le Coq *et al.*, 2001).

Despite the success of delta's agricultural production, the strategy for country's recovery was

to impose the central planning and collectivisation applied in the North Vietnam also to the South. The centrally applied five-year plans in late 1970s and early 1980s failed in the Delta as a result of inefficiency of centralised planning and reluctance to take measures to collectivise the Delta's agricultural production (Le Coq *et al.*, 2001). The severe decline in agriculture productivity, particularly in the Mekong Delta, was one of the main reasons for government to undertake remarkable changes in its policy. As a result, in 1986 Vietnam adapted so-called renovation policy (*doi moi*) that was based on more market-oriented development strategy, and introduced an array of institutional and economic reforms. More free-market enterprises were permitted, and the push to collectivise the industrial and agricultural operations was abandoned.

Although *doi moi* had rather strong focus on urban areas, the Mekong Delta led in many aspects the way in this economic transformation (Drakakis-Smith & Dixon, 1997; Taylor, 2004). In the Delta *doi moi* meant that farmers could sell their agricultural products at higher prices than before. As a result farmers intensified their rice cultivation methods and started to use more fertilizers and pesticides, and the average rice yield increased from 3t/ha to 4 t/ha between 1985 and 1995 (Le Coq *et al.*, 2001). During the past decade Vietnam, and consequently the delta, has taken further steps away from centrally planned economy which has resulted in further increase, and more recently also in more diversified agricultural production.

The delta's high population density has therefore in no serious way been a limiting factor for the development of the area. In fact, it seems that the situation has actually been partly vice versa. Le Coq *et al.* (2001), for example, argue that the reasons for the success of the delta's development are two-fold; good agricultural infrastructure and the sound social structure that made farmers willing to invest capital and labour for agricultural development. Le Coq *et al.* (2001) also point out that the availability of labour was a critical factor for the agricultural development in the delta. It could therefore be argued that the delta's

high population density -meaning higher social capital and good availability of labour- was one contributing factor for innovations in cultivation methods and, overall, for rapid development in the delta. It also seems that the dense population has contributed for mutual learning and information exchange between farmers based on customary knowledge and local forms of communication (Taylor 2005).

Today, the delta and entire Vietnam face new kinds of problems. The negative side of the entire country's progress has been widening gap between the rich and the poor. Increased corruption is also a problem, although the government has taken measures to counter corruption and increase local democracy (Fritzen, 2002; Jorgensen, 2005). In terms of the Mekong Delta, the aggressive infrastructure development has resulted in environmental and social problems that remain to be solved (Käkönen, 2008; Miller 2003).

#### 4.2 Population indicators

The total population of the 12 provinces<sup>5</sup> of the Mekong Delta was in 2001 around 16.5 million, meaning an average population density of 416 persons/km<sup>2</sup> (Table 4). Out of this population, about three million people i.e. bit less than 20% live in urban areas. The average number of people per household in the delta is 5.4, while the population growth rate is around 2,4% per year (SIWRP and VNMC, 2003). The population density is highest in the areas along the Mekong River and the Bassac River, indicating the importance of access to water (both for agriculture and transportation) for the delta's inhabitants.

Although Vietnam's population growth rates are overall lower than in Cambodia, it is estimated that country's population continues to increase for next 40-50 years and will probably stabilize at the level of 120 million (UNFPA, 2005). As a result, high population and labour growth is still considered to be among the main challenges for Vietnam's development (The Socialist Republic of Vietnam, 2003).

#### 4.3 Delta's livelihood structure

Despite the fact that the Mekong Delta comprises only around 10% of the total area of Vietnam, it plays a central role in country's development. The delta is also determined as a key area for the national food security strategy. Rice cultivation and aquaculture are dominant livelihood activities, although in recent years agricultural production has diversified significantly and also the importance of non-agricultural sector has increased (van de Walle & Cratty, 2004).

The Delta contributes currently about half of the national food volume of the entire country, 55% of the national fishery and fruit production, and around 60% of the national export value (SIWRP and VNMC, 2003). Despite the high agricultural production and economic growth, the Delta still remains as one of the poorest areas in Vietnam. The challenges with poverty reduction have been linked, among other things, to the delta's low educational level, and resulting lack of human capital (Taylor, 2004). When compared to the other parts of Vietnam, the education level in the delta is remarkably low with 33% of the population having not finished their primary school<sup>6</sup>.

Thus, despite clear economic successes of long-term commitment in the infrastructure development in the delta, there are also drawbacks and challenges. While the problems related to water quantity have largely been solved, water quality problems have increased (Käkönen, 2008, MRCS/WUP-FIN, 2007). With the construction of defensive water resources infrastructure the Delta has become more physically interconnected and complex, and is now increasingly subject to human regulation, and therefore also political tensions (Miller, 2003).

### 5 Conclusions

This Chapter has discussed the relationship between population, natural resources and development in two unique areas in the Mekong Basin, the Tonle Sap area of Cambodia and the Mekong Delta of Vietnam. While the areas share similarities e.g. in terms of their overall livelihood

structures, there are also remarkable differences between the two areas. Most relevant difference in this context is the fact that the delta is -despite its much higher population density- in terms of its development in entirely different level than the Tonle Sap area. The case studies indicate that the linkages between population, resource use and development are far from being straightforward. The case studies thus indicate that the linkages between population, resource use and development are far from being straightforward, and highlight the importance of broader context when looking at these linkages and, overall, the possibilities for sustainable development in different areas.

The context matters (at least) in two different ways. Firstly, the areas' development depends always from several different factors. Population density is definitely one important factor, but also other social, economic, geographical, infrastructural, environmental, and -in particular- political factors have a great influence for the way the area develops - or does not develop. The success of the Mekong Delta, for example, results from a combination of several different factors, many of which actually challenge the commonly held beliefs about the way the areas' should be developed (Taylor 2004)<sup>7</sup>.

The analysis of relationships between population, natural resource use and development should therefore never be separated from the other critical factors impacting development and resource use. Similarly important is the understanding of historical development in the area; the analysis of the past helps usually to understand the current circumstances and possibly to guide way towards more sustainable future. Finally, it is crucially important to take into account the local ways and patterns of economic, social and cultural activities as these are often the factors that ultimately enable successful development (Taylor, 2004).

Secondly, the actual impact of population density to development -and vice versa- depends very much from the context. Higher population density usually puts natural resources under increasing pressure, and can therefore impact both environment and overall development negatively.

But as was shown in the case from the Mekong Delta, also positive impacts are possible; higher population density creates larger human resource base that provides sufficient labour and can also foster social and economic development through new ideas and innovations. Achieving this kind of positive correlation depends, however, very much from the broader context: to flourish, the existing human resource base needs to be supported by sound education and governance systems, and well-functioning infrastructure.

The findings of this Chapter therefore support so-called Optimistic and Neutralist Theories on the relationship between population and development. This does not mean, however, that high population density and development are not related, or that higher population densities are not problematic for developing countries. Quite the opposite: in most of the areas in the world -including the Tonle Sap and the Mekong Delta- higher population densities bring remarkable challenges, including increased possibilities for environmental degradation, resource conflicts, food insecurity, and increasing disparity.

What this Chapter seeks to illustrate is that the relationship between population and development is much more complex and multifaceted that seems to be commonly portrayed. By sticking to different kinds of simplified arguments and explanations -indeed, Modern Myths- it is easy to forget that there are also several other factors that contribute for development and lack of it. At the same time there is a threat that the possibilities related to changes in population and its structure are overlooked. When looking at the population, the emphasis should therefore not be only on population policies, but also on other sectors.

Realising the opportunities for development brought by increasing population is particularly important for the Tonle Sap area, where a majority of the people lives in poverty. By sharing the lessons learned -both positive and negative- from the areas such as the Mekong Delta, the area may be able to develop in environmentally and socially sustainable way. But in order this to happen, the

overall context need to be improved: the Tonle Sap area needs a more comprehensive management plan with strong participatory character, equal and non-corrupt governance system and functioning market mechanisms. Without these the Modern Myth depicted in the title of the Chapter may turn out to be true for the Tonle Sap area.

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## Endnotes

- 1 The two theories also highlight the importance of governance and democracy in development and food security: as Amartya Sen has noted, there has never been a severe famine in a functioning democracy (Sen, 1999).
- 2 Relative poverty rates are measured separately for each country based on the national consumption levels for food and basic necessities (MRC, 2003a)
- 3 This GNI value for Cambodia was gained by using Atlas method; when using Purchasing power parity (PPP) method the GNI of Cambodia is 2920\$ (World Bank 2007).
- 4 As stated in 1968 in the Atlas of Physical, Economic and Social Resources of the Lower Mekong Basin (United Nations, 1968): “The four riparian countries have an abundance of natural resources. The combination of climate, soils, topography and human endeavour have long enabled Cambodia, Thailand and Vietnam to produce significant rice production surplus. ... Cambodia’s Great Lake [Tonle Sap], linked to the Mekong by the Tonle Sap River, and into which the Mekong flows in the flood season is an outstanding fish reservoir”.
- 5 Can Tho Province was in November 2003 divided into Can Tho City and Hau Giang Province, increasing the total number of provinces in the Mekong Delta to thirteen. The population data presented here is based on information collected before this division.
- 6 As pointed out by Taylor (2004), however, school-based education is a statist definition that leaves out host of other, more ‘informal’ ways of circulating and reproducing knowledge. When discussing the paradox between low school enrolment and high economic growth in the delta, Taylor also argues that the current formal education system may simply not meet the needs of local economy in the delta.
- 7 Taylor (2004) discusses four such paradoxes in the delta: the paradox between land liberalization policies and increasing number of farmers losing the land ownership; between the poor overland transport network and significant amount of agricultural exports; between high income levels and low educational level; and between the assistance to the Khmer Krom ethnic minority and their increasing isolation.

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