Paradoxes in Adaptation: Economic Growth and Socio-Economic Differentiation. A Case Study of Mid-Central Vietnam

Mogens Buch-Hansen, Nguyen Ngoc Khanh and Nguyen Hong Anh

Abstract This chapter will introduce the geographical conditions and economic characteristics of Central Vietnam. It proceeds to analyse the general economic development in the region, particularly since the introduction of economic reforms in the early 1990s. Both foreign investment and exports have risen dramatically, turning Vietnam into a major exporter of a range of agricultural and industrial products. Further, it shows how some of the paradoxes of development and globalization, such as high growth and simultaneous socio-economic differentiation, are also played out in the provinces of Central Vietnam. In a disaster prone region, the poor households are at risk of losing out when greater weather variability threatens agricultural and forestry production and increases overall economic losses. The rapid expansion of the hydropower generating capacity has stimulated economic development and thereby potentially enhanced social resilience, but at the same time has increased the ecological vulnerability and set in motion a range of processes not under control.

Keywords Economic development • Social differentiation • Adaptation capability • Social resilience and ecological vulnerability

1 Introduction

For nearly two decades now, international debates at the COP meetings have centred on the costs of mitigating climate change among the big greenhouse gas (GHG) emitters in the 'old' industrialised countries. They have also addressed the problem of escalating emissions among the emerging economies, and the costs of

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adapting to the inevitable changes resulting from climate change.[1] Climate change has become part of wider debates on climate (in)justice and rights to development (Huq et al. 2006) as a result of confirmation by the International Panel for Climate Change (IPCC) that climate changes are induced by humans (IPCC 2007), and the 2006 Stern Report's estimation of the costs of climate changes (Stern 2006). Another important issue debated at the COP meetings concerns how to share the costs of adaptation to ongoing climate changes, especially those incurred by poorer developing countries (World Bank 2010b). Vietnam is highly vulnerable to predicted increases in climate variability and extremes, making this an issue of major concern to the political leaders at the helm of the country's rapid economic growth. Vietnam's long coastline bordering the Chinese Sea, the vast low-lying river deltas of the Mekong and the Red River, and the steep slopes between the high mountains bordering Lao PDR and the coastline in Mid-Central Vietnam make Vietnam very prone to rising sea levels, heavy storms and the extreme precipitation resulting from frequent tropical typhoons. Even leaving aside the predicted increase in climate variability and extremes, current extreme weather conditions (including frequent typhoons with excessive rains and heavy storms, an unpredictable farming calendar, salt water intrusion, etc.) are seriously undermining economic development and accentuating social differentiation.

However, in order to fully understand how climate-related natural disasters affect environments and economic development, it is essential to investigate the relationship between climate variability and extremes, and man-made environmental changes (Bruun 2012). The World Bank's Discussion Paper on the Social Dimensions of Adaptation to Climate Change in Vietnam states that between 1953 and 2009 climate related natural disasters resulted in nearly 25,000 deaths, with a further 77 million people affected. Damages due to natural disasters during the same period have been estimated at more than 7 billion USD (World Bank 2010a). This chapter will analyse economic development and socio-economic differentiation in Mid-Central Vietnam, and specifically Quang Nam Province, which is one of the provinces that is highly vulnerable to predicted increases in climate variability and extremes which are likely to exacerbate existing problems.

1.1 The Transition After Reunification

During the decade following reunification in 1975, the Vietnamese economy was busy recovering from many years of war, a process which both involved rebuilding the country's physical infrastructure and restoring its social, economic and institutional infrastructure. The second Five Year Plan (1976–1980) called for a major emphasis on heavy industry and rapid agricultural growth.

[1] COP stands for Convention of Parties which is the annual meeting held among the parties of the UN Framework Convention for Climate Change (UNFCCC).

> The optimism and impatience of Vietnam's leaders were evident in the Second Five Year Plan. The plan set extraordinarily high goals for the average annual growth rates for industry (16–18 %), agriculture (8–10 %), and national income (13–14 %). It also gave priority to reconstruction and new construction while attempting to develop agricultural resources, to integrate the North and the South (The Library of Congress Country Studies 1987).

During this period, industrial production grew by a mere 0.6 % and agriculture by 1.9 %, and as such the Plan must be considered a failure. This failure was due to a number of adverse factors such as problems in reunifying the economy, unfavourable weather conditions, high military expenditure, managerial inefficiency, etc. However, the poor performance of the productive sectors seems to have been compensated for by deforestation and logging activities, where peak output was attained during the Second Five Year Plan (Beresford and Fraser 1992, p. 7). Following the 6th National Party Congress in 1986, Vietnam embarked on its renewal process, *Doi Moi*, which marked the beginning of a period of unprecedented economic growth and social dynamism throughout the entire Vietnamese economy. Vietnam thus became an example of a thriving socialist oriented market economy whose progress was only briefly slowed by the Asian financial crisis of 1997 and the global economic crisis that occurred just over a decade later in 2008.

This chapter describes some of the main achievements of the country as a whole, and also focuses specifically on the South Central Coastal Region and Quang Nam Province. The aim is to show how the economic growth and socio-economic differentiation that have occurred since the introduction of *Doi Moi* have created paradoxes in the capacity of particular communities and socio-economic groups to adapt to climate variability and extremes in the region. The South Central Coastal Region of Vietnam is highly vulnerable to predicted increases in climate variability and extremes (World Bank 2010b; Kelly et al. 2001). Yet existing climate conditions are already extreme, such as frequent typhoons, salt water intrusion from rising sea levels, heat waves and periodic droughts, calling for dynamic adaptation measures to protect the economy and livelihoods of the local communities.

Vietnam's rapid economic growth since the mid-1980s has greatly enhanced the country's overall resilience to extreme weather conditions, but it has also produced a number of paradoxes, notably differences in various groups' capacity to adapt to increased climate variability and extremes. We address this issue below, drawing on the concepts of vulnerability, resilience and adaptation. We use resilience and vulnerability as antonyms, where resilience refers to the number of external disturbances a system can withstand before it is drastically or even irreversibly changed. Adaptation is, in turn, understood here as activities aimed at decreasing vulnerability to such external disturbances (Adger et al. 2001; Ensor 2011).

2 Doi Moi and Rapid Economic Growth

A number of laws were implemented in the years following the 6th National Party Congress with a view to facilitating the transition to a market economy and attracting and securing foreign investments. These laws include the Foreign Investment

Law of 1987, the Private Enterprise Law and Corporate Law introduced in 1991, followed by the amendment of the Constitution in 1992. These laws all affirmed the existence and development of a multi-sector, market economy, including foreign investments. They were followed by the Land Law of 1993, the Environment Law (1993), the Bankruptcy Law (2004) and the Intellectual Property Law (2005), as well as hundreds of ordinances and decrees that were enacted to guide the implementation of the socialist oriented market economy.

The results of these reforms in terms of economic growth are impressive, as shown in Fig. 1. From a relatively slow start, growth in GDP of 2.8 % p.a. in 1986 rose to 8.2 % p.a. for the period 1991–1995 and then dropped to 7.5 % p.a. from 1996 to 2000 due to the Asian financial crisis. Thereafter, it slowly picked up again, reaching 8.5 % in 2005. Vietnam's GDP decreased following the 2008 global financial crisis, but picked up much faster than most other economies, peaking at 6.8 % in 2010 and then dropping again to 5.9 % in 2011. These high levels of economic growth were triggered both by the transition of the economy from agriculture to industry, trade and services, and the privatisation of the economy, including the influx of foreign investments. Table 1 shows the transition in the structure of the economy during the 20 years following the introduction of *Doi Moi* in 1986, with decreasing contributions to GDP from agriculture, forestry and fishing and increasing contributions from industry and construction. The service sector's contribution to GDP has remained relatively constant, at 38.6 % in 1990, 38.1 % in 2005 and 38.3 % in 2010. However, the high quality services within finance, insurance, IT and tourism increased rapidly. The number of foreign tourists visiting Vietnam increased by 63 % between 1999 and 2004 from 1.7 million to 2.9 million; and then again by 45 % to 4.2 million in 2008. Due to the global financial crisis, the number of tourists fell to 3.8 million in 2009 but the total number of foreign visitors to Vietnam in 2010 still exceeded 5 million.

Economic growth since the introduction of *Doi Moi* has, to a large extent, been spearheaded by the economic privatisation process, not least the growing foreign investments. From 1991 to 2003, the private sector's share of GDP rose from 3.1 to 4.1 % while the GDP share of other non-state sectors increased from 4.4 to 4.5 %. Meanwhile, the foreign investment sector grew from 6.4 to 14 %. With the promulgation of the Enterprise Law in 2000, the number of registered private enterprises more than doubled, rocketing from 73,000 to 150,000 in 2004. The inflow of private investments ranged between 1.3 billion and 1.8 billion USD per annum between 2002 and 2006, while in 2007 they soared to 6.6 billion USD and then to 9.3 billion USD in 2007. Throughout the same period, exports grew steadily at around 20 % per year, reaching 26 billion USD in 2004, 32.23 billion USD in 2005 and 56.6 billion USD in 2009. Of these totals, 47 % resulted from FDI (General Statistical Office of Vietnam). The global financial crisis caused a drastic drop in inward FDI in 2008 and 2009 but had already picked up by 2010 and was expected to increase further by 2011[2] as Vietnam is considered an attractive

[2] Figures for 2011 are not yet available.

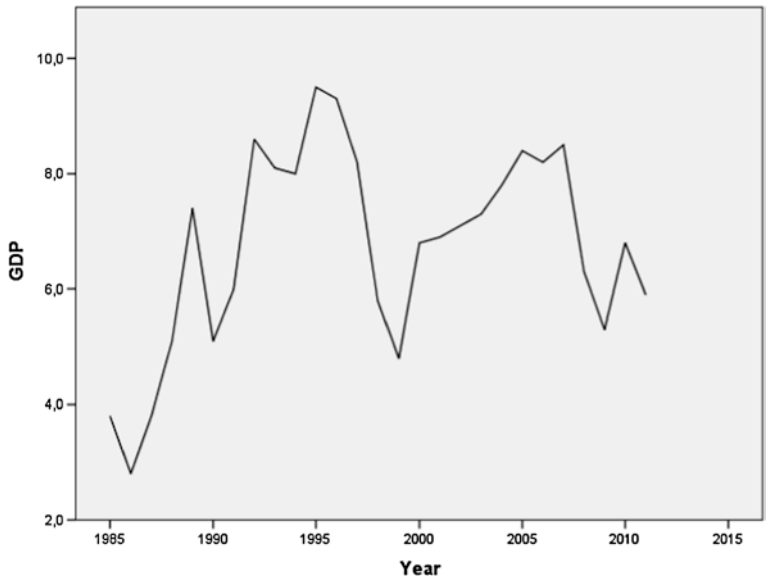

Fig. 1 GDP growth, 1985–2011

Table 1 Structure of sectors' contributions to Vietnam's GDP

Sector	1990	1995	2005	2010
Agriculture, forestry and fishing	38.7 %	27.2 %	20.9 %	20.6 %
Industry and construction	22.7 %	28.8 %	41.0 %	41.1 %
Services	38.6 %	–	38.1 %	38.3 %
Total	100		100	100

Source Vietnam statistical yearbooks

location for FDI in Southeast Asia. Like most of the Asian emerging economies, Vietnam displays very high rates of investment, amounting to 33.9 % of GDP in 2009 (General Statistical Office of Vietnam). Yet the picture is not all rosy—in the conclusion We touch on some recent problems afflicting the Vietnamese economy.

The agricultural sector has by no means been left behind by the rapid growth of the industrial sector, especially not compared to the pre *Doi Moi* era when Vietnam experienced long periods of hunger and malnutrition. The promotion of agriculture and aquaculture has made Vietnam self-sufficient in basic foodstuffs and a prime exporter of agricultural and aquaculture commodities, making it the world's biggest exporter of cashew nuts in 2010, the second largest producer of rice and coffee, fourth in rubber exports, and fifth in fishery and aquaculture, with cultivated shrimps the fastest growing export commodity.

A strong indicator of the strength of *Doi Moi* is the fact that GDP per capita more than quadrupled in only twenty years in current prices, from 200 USD in 1990, to 640 USD in 2005, to 1.100 USD in 2010.

3 Economic Development and Social Differentiation in Quang Nam Province

Quang Nam Province belongs to Vietnam's South Central Coastal Region. In 1995, the province was separated from Da Nang city, just north of the present provincial border. As shown in Table 2, Quang Nam is the province with the largest area in the region, and is fairly densely populated with an average of 200 persons per square kilometre. Quang Nam is, however, on average less densely populated than the other provinces in the region, but this average hides great differences between the densely populated coastal plains and the sparsely populated mountainous districts (see Figs. 3, 4).

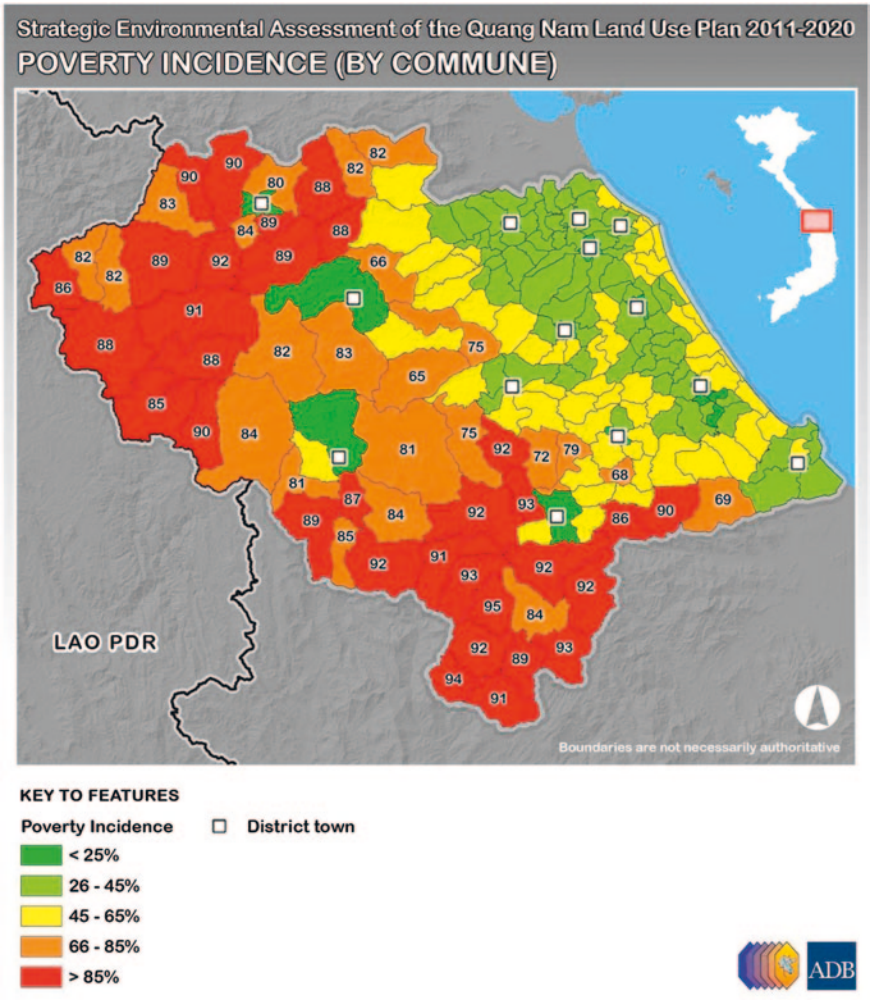

Fig. 2 Poverty incidence in Quang Nam Province (Quang Nam Provincial People's Committee 2010)

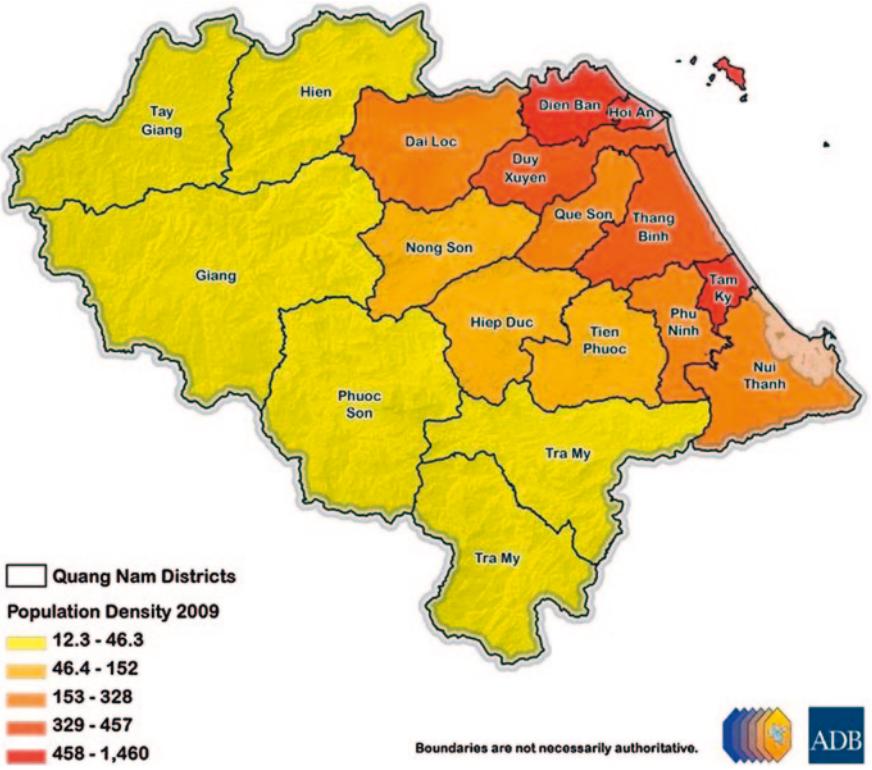

Fig. 3 Population density in Quang Nam province 2009 (Quang Nam Provincial People's Committee 2010)

Table 2 Basic characteristics of the south central coastal region in 2007

No.	Province/ municipality	Area (km²)	Population (2007)	Population density (persons/ km²)	GDP per capita (million VND, 2007)
1	Đà Nẵng	1,256	805,400	641	18.98
2	Quảng Nam	10,438	1,484,300	142	8.76
3	Quảng Ngãi	5,153	1,288,900	250	7.82
4	Bình Định	6,040	1,578,900	261	9.57
5	Phú Yên	5,061	880,700	174	8.43
6	Khánh Hòa	5,218	1,147,000	220	16.10
7	Ninh Thuận	3,363	574,800	171	6.66
8	Bình Thuận	7,837	1,170,700	149	11.00
9	Total	44,367	8,930,700	201	10.76

Source General statistical office of Vietnam

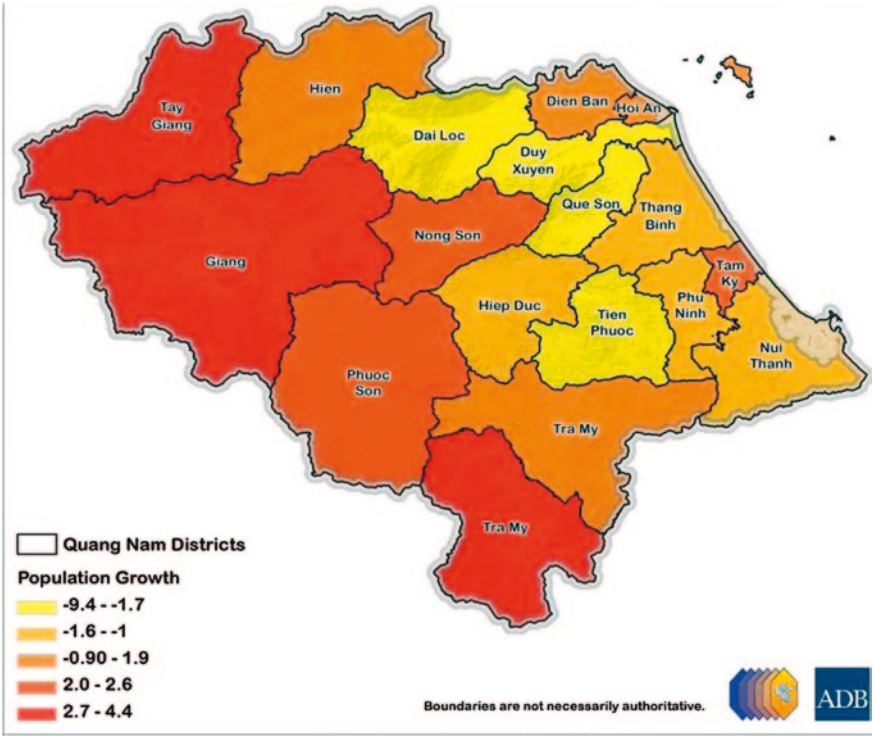

Fig. 4 Average population growth rates 2005–2010, Quang Nam province (Quang Nam Provincial People's Committee 2010)

In 2007, the South Central Coastal Region accounted for 9.5 % of the Vietnamese population and produced 9.7 % of Vietnam's GDP based on agriculture, forestry and fishing. Although considered a relatively highly industrialised region, surpassed only by the industrial hubs of Hanoi and Ho Chi Minh City, the region only accounted for 7.54 % of Vietnam's industrial GDP in 2007 (Vietnam General Statistics Office 2009). Formerly, the region was largely dependent on the direct utilisation of natural resources in agriculture and fishing, which accounted for 47.5 % of the regional GDP in 1990, but by 2002 this dependence on natural resources had been greatly reduced, to 38.7 % of regional GDP. This downward trend continued, falling to a mere 9.5 % by 2010. During the same period, the industry and construction sectors increased their share of GDP from 22.7 % in 1990 to 23.9 % in 2002, further rising to 46.1 % in 2010. Meanwhile, during the same period the service sector grew from 29.8 to 37.4 % and again to 44.4 % of regional GDP in 2010. The sharp increase in contribution to regional GDP by industry, construction and services was due in no small measure to the rapid industrialisation and modernisation of Da Nang, Vietnam's third largest city, which attracted large numbers of tourists to its long white beaches and the nearby charming trading post of Hoi An where centuries earlier Chinese and Portuguese traders had created an East–West cultural melting pot.

The province of Quang Nam covers the largest area of the eight provinces in the South Central Coastal Region, but has a relatively low GDP per capita compared to the regional average, as shown in Table 2. This is largely due to the great geographical diversity that characterises the province, which ranges from the mountainous districts bordering Lao PDR, to the Midlands and the coastal plains. While the coastal plains are just as well off as the coastal plains in the other provinces, the mountainous districts, which are largely inhabited by ethnic minorities, have much larger populations living below the poverty line (see Fig. 2). Being sparsely populated, they are also the districts with the highest rates of population growth, as shown in Figs. 3 and 4. So, while the average provincial natural growth rate fell by more than one half from 1.9 % in 1996 to 0.9 % in 2010, the natural growth rate in the mountainous districts with a higher percentage of ethnic minorities remained high. With growing pressure on land on the coastal plains there has also been an influx of ethnic Kinh people (Vietnam's main ethnic group) who have established their own villages in the mountainous districts.

Tables 1 and 3 show that the transition process began later in Quang Nam Province than in other regions in Vietnam. While in Quang Nam in 2005 31 % of GDP (down from 51 % in 1996) was still generated by agriculture, forestry and fishing, compared to an average 20.9 % for Vietnam in general; and only 34 % of GDP was produced by industry and construction (though this had doubled since 1996!) compared to 41 % on average in Vietnam, it is remarkable that by 2010 the figures for Quang Nam Province had almost caught up with the Vietnamese average. Since the onset of the global financial recession, the province has experienced a very rapid transition from being very dependent on the direct utilisation of natural resources, to becoming more dependent on manufacturing industry, construction and services. As evident from Table 4, although approximately 50,000 jobs

Table 3 Structure of sectors' contributions to Quang Nam's GDP

Sector	1996 (%)	2005 (%)	2010 (%)
Agriculture, forestry and fishing	51	31	21
Industry and construction	17	34	40
Services	32	35	39
Total	100	100	100

Source Quang Nam statistical yearbooks

Table 4 Employees by economic sector in Quang Nam province, 1976–2010

Sector	1976	1985	Growth in % 1976–1985	1990	2000	2005	2010	Growth in % 1985–2010
Agriculture, forestry and fishing	292.120	398.925	36.6	456.880	558.257	531.889	481.112	20.6
Industry and construction	30.793	34.212	11.1	37.592	56.903	88.398	156.892	358.6
Services	3.410	36.456	969.1	37.334	73.135	126.188	174.192	377.8
Total	354.323	469.593	32.5	531.696	688.295	746.475	812.196	73.0

Source Quang Nam statistical yearbooks

were lost within agriculture, forestry and fishing between 2005 and 2010, 116,500 new jobs were created within industry, construction and services during the same period.

While the contribution of agriculture, forestry and fishing to provincial GDP dropped from 51 % in 1996 to only 21 % in 2010, the number of employees in the sector dropped at a much slower pace, which has resulted both in social and income differentiation. This differentiation is seriously impairing different population groups' ability to adapt to the extreme weather events already occurring and will increase the challenges for those groups, considering the predicted increases in climate variability and extremes.

As it is the industrial sector that is the driving force behind the current transition, both in Vietnamese society generally and in the economy of Quang Nam Province, it is interesting to note the change in ownership of gross industrial output during the rapid transition period, as shown in Table 5. The state sector is retreating rapidly, while private investments, and not least foreign investments, are growing swiftly. The global financial crisis is, however, clearly reflected in the slowdown of output from foreign investments in 2009, which had nonetheless already regained momentum by 2010. The South Central Coastal Region, including Quang Nam Province, is playing a major role in Vietnam's drive to integrate itself into the global economy and is, like other regions in Southeast Asia, among the emerging economies that are proving a serious competitor to the old industrial centres of Europe, America and Japan.

Foreign investments are, to a large extent, targeting the new industrial zones in Dian Nam in Dien Ban District between Da Nang and Hoi An, and the very new industrial processing zone of Chu Lai developing in the coastal plain region

Table 5 Industrial gross output (current prices) by ownership in percentage

Quang Nam province	2006	2007	2008	2009	2010 (est.)
State	20.44	13.18	11.21	11.07	9.92
Central	11.42	8.64	7.35	8.46	7.60
Local	9.02	4.54	3.86	2.61	2.32
Non-state	68.44	70.99	69.95	76.17	74.77
Collective	4.07	2.64	1.78	1.01	0.93
Private	49.20	55.96	56.36	64.95	63.33
Households	15.17	12.38	11.81	10.21	10.51
Foreign investments	11.12	15.83	18.84	12.76	15.31
Total	100	100	100	100	100
Dien Ban District[a]	41.6 %	38.6 %	35.2 %	29.1 %	28.0 %
Nui Thanh District	9.0 %	9.0 %	10.9 %	14.0 %	16.4 %
Number of foreign visitors to the Province	653.264	1.102.193	1.143.833	960.830	1.062.982

Source Quang Nam statistical yearbook 2010

[a] The figures for the two districts of Dien Ban and Nui Thanh show the districts' share of Quang Nam Province's Non-State industrial gross output at constant prices

Table 6 Number of tourists to Quang Nam province 1997–2010

Number of tourists/year	1997	2000	2005	2006	2008	2010 (prel.)
International	74,855	218,871	672,554	653,264	1,143,833	1,062,982
Domestic	19,508	163,834	533,372	631,471	620, 383	701,368
Total	94,363	382,705	1,205,926	1,284,735	1,764,216	1,764,350

Source Quang Nam 10 years and statistical yearbook 2010

of Nui Thanh District. In particular, Chu Lai Industrial Zone is attracting a large number of younger men from neighbouring districts and, according to interviews with district and commune officers from the Midlands and coastal plains, off-farm incomes from industrial work account for approximately 20 % of household incomes in the Midlands and coastal plains of the province.

Furthermore, the number of foreign visitors is increasing rapidly (see Table 6). Tourism is the fastest growing sector in the world, and Vietnam in general and the province of Quang Nam in particular are working hard to benefit from that growth, not least by constructing huge tourist resorts at the famous China Beach between Da Nang and Hoi An. Also remarkable is the rapid growth of domestic tourism. This was almost non-existent up to 1997, but in 2007 over 700,000 domestic tourists visited the province. The number of foreign visitors also multiplied by a factor of 14 between 1997 and 2010, and has seemingly only been mildly affected by the 2007 global financial crisis. By 2008, more than 1.1 million foreign tourists visited Quang Nam and it is estimated that over 1 million foreign tourists visited Quang Nam in 2010, accounting for approximately 20 % of the total number visiting Vietnam.

In 2011, the Quang Nam People's Committee in collaboration with UNESCO developed a new integrated culture and tourism strategy for sustainable development that aimed to change the quantitative growth approach to tourism to a quality-based growth strategy. The strategy aims to ensure the sustainability of Quang Nam's culture-tourism sector, including protecting cultural and natural resources, increasing local communities' benefits from tourism, and diversifying provincial tourism products. Special management plans have been drawn up for the World Heritage Sites of Hoi An, My Son and the Cham Island Biosphere Reserve (Duong 2011).[3]

3.1 Hydropower Production in Quang Nam

As a rapidly growing emerging economy Vietnam needs power, and hydropower already accounts for approximately one third of Vietnam's power production. It is estimated that demand is increasing by 15 % per year and insufficient

[3] For a critical review of the 'Western' concept of Heritages Sites, in view of the rapidly increasing number of local tourists, see (Hitchcock et al. Hitchcock et al. 2009).

power is by many observers seen as a serious impediment to further economic growth (International Centre for Environmental Management 2006). The Central Highlands have great potential for hydropower generation, and the mountainous districts of Quang Nam Province already host a number of hydropower projects. A further 60 new projects have just been completed, are under construction or are scheduled in the Quang Nam Power Development Plan 2006–2010. This will add about 1,600 MW to the projects already in operation (DOIT: Quang Nam Power Development Plan 2006–2010 with a Vision to 2015). Hydropower projects are, however, a controversial topic in Vietnam, due to contradictions between the dire need for power to fuel the growing economy, and the serious social and environmental impacts of most of these projects. Due to the uncertainty created by contradictory interests, the planning of hydropower projects is somewhat confusing as projects that have already been approved are being cancelled while new ones are constantly being added, requiring new environmental impact assessments. In 2006, a Strategic Environmental Assessment identified 82 environmental, social and economic issues to be dealt with in the Quang Nam Power Development Plan (International Centre for Environmental Management 2006). According to the VietNamNet website, in 2012 Quang Nam Province had 43 hydro-power plants, including ten large scale ones. The three largest works are Song Tranh 2, with a reservoir of 740 million cubic meters of water, A Vuong with 343 million cubic meters and DaMil with 310 million cubic meters (VietNamNet 2012b).

The environmental problems caused by hydropower projects are manifold, especially if the projects require reservoirs to store water for a constant annual production of power. Local people (often ethnic minorities) have to be resettled, and subsequently demand reasonable compensation for lost livelihoods—though they do not always receive this. In addition, endangered species of plants and animals are, in many cases, threatened by the inundation of pristine forests that takes place when creating the water reservoirs. The remaining forest cover around the watershed has to be maintained to secure the infiltration of rain water and to avoid soil erosion that will result in the siltation of the reservoirs. This is often in direct conflict with the local residents who have been evicted from their land to make room for the reservoirs. In order to secure their livelihoods they are forced to clear forest, often in the nearby watershed of their inundated homelands. On top of this, illegal lumberjacks can now enter the hitherto impenetrable forests by use of the waterways provided by the reservoirs. Thus, rare and precious forests that were previously considered inaccessible are now been logged for illegal commercial purposes (VietNamNet 2012a).

In extreme weather situations with excessive rain, proper management of the reservoirs is essential to avoid the water from the reservoirs contributing to the potential flooding downstream when the gates are opened. Similarly, during periods of drought, it is essential that the hydropower projects do not store the water for power generation instead of releasing it for irrigation. Deforestation resulting from the building of the water reservoirs and/or the resettlement of evicted residents, together with reservoir management during excessive rain and drought, are examples of man-made environmental changes that aggravate the environmental and socio-economic impacts of extreme weather situations.

The Vu Gia Thu Bon river system has great potential for hydropower production, and existing projects [A Vuong, Song Tranh, Dak M, Song Con and others (see map, Fig. 5)] already provide more than 1,000 MW.

According to the SEA of the proposed and planned hydropower projects, there are a large number of unsolved environmental, social and economic issues that occasionally lead to some projects being scrapped in favour of new potential projects. The demand for power to fuel the rapidly growing economy is huge, leading to intense political pressure to implement hydropower projects despite the abovementioned environmental, social and economic problems. The political power of the stakeholders involved is highly unequal. The ethnic minorities and small-scale farmers being resettled, those whose fields are inundated during excessive rains due to poor management of the water reservoirs, and those who lack water for irrigation during periods of drought due to the prioritisation of hydropower production, are politically weak compared to the ruling elites and private investors who need the electric power. When confronted with the question of how one should prioritise between using the water in the reservoirs for irrigation or for hydropower production during periods of drought, high ranking provincial officers in Quang Nam Province unanimously confirmed that hydropower production will be given first priority, although they could definitely see the problems caused by it (Personal communication in October–November, 2011).

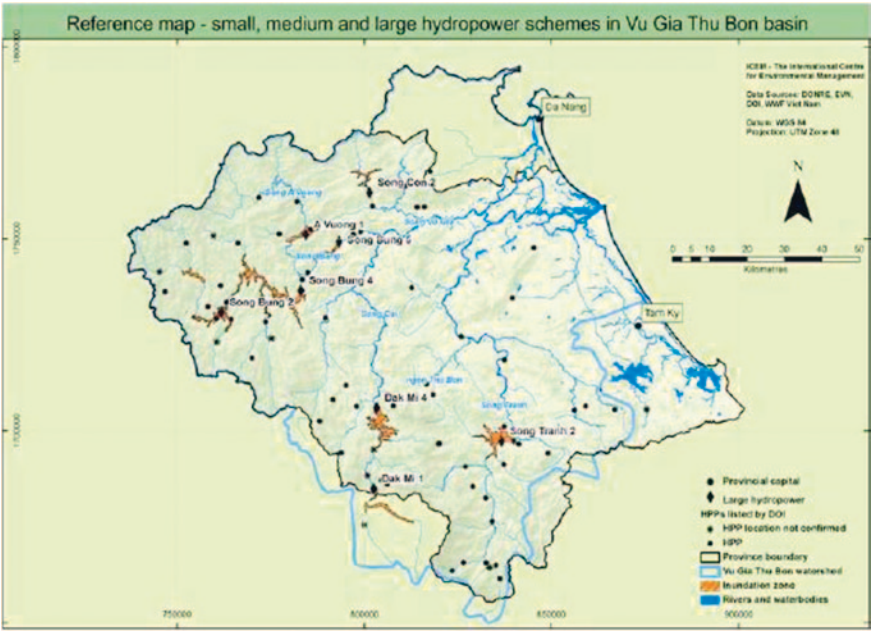

Fig. 5 Map of proposed and existing hydropower schemes in Vu Gia Thu Bon Basin, covering most of Quang Nam province

4 Economic Development, Socio-Economic Differentiation and Its Impact on Adaptation Capabilities

National and local communities' vulnerability and resilience towards extreme weather situations has been heavily influenced by the *Doi Moi* economic renewal process, particularly the transition from a resource dependent society to an emerging industrial society with vigorous economic growth and increasing social differentiation. Awareness of these issues should inform any planning initiatives designed to ease adaption to this new situation. In that connection, it is important to distinguish between ecological and social vulnerability and resilience, as well as to highlight their very close relationship (Adger 2000). Whereas resilience, as described above, refers to the amount of external disturbances a system can withstand before it is drastically and even irreversibly changed, adaptation capabilities refer to how a society or smaller community can enhance its ecological resilience (e.g. through changes in land use towards more weather resilient crops or activities, constructing dykes or river protection walls, etc.) and social resilience (e.g. changing from on-farm incomes to off-farm incomes, or changing to high income generating on-farm activities like acacia plantations or shrimp farms, establishing warning systems and assuring disaster preparedness, etc.) (Ensor 2011).

The rapid economic growth that has taken place in Vietnam since the mid-1980s, and in Quang Nam Province since the turn of the millennium, has enhanced both national and provincial social resilience against extreme weather events. The province has also prepared for predicted increases in climate variability and extremes by enhancing ecological resilience through infrastructure projects such as building higher bridges across the many rivers running towards the sea, and building dykes aimed at preventing salt water intrusion, landslides etc. The economic transition has made a major part of the economy less vulnerable to increased climate variability and extremes. It is self-evident that the creation of income generating employment in activities that are not related to the direct utilisation of natural resources decreases vulnerability for those employed in these activities, but at the same time enhances socio-economic differentiation between those involved in high value-added, off-farm activities and those employed in low value-added activities in agriculture and fishing. As shown below, this creates differentiation in various social groups' vulnerability and resilience against extreme weather conditions.

As shown in Table 7, average incomes in Quang Nam Province doubled in only six years between 2004 and 2010. This increase has, however, been unequally distributed among the different groups in the province: incomes for those engaged in direct utilisation of natural resources in agriculture, forestry and fishing have increased by 62 %, while those earning their incomes outside these activities have risen by 264 %. This discrepancy is also reflected in the fact that urban population incomes have increased by 236 % compared to 184 % for rural populations. The 20 % richest households' incomes grew by 233 %, compared to the 20 % poorest households whose incomes rose by 152 %. Although the increase in incomes is

Table 7 Monthly average income per capita (1,000 VND at current prices) by residence, income source and income quintile

	1999	2002	2004	2006	2008	2010 (estimated)	Percentage change 2004–2010 (%)
Total			328.8	459	693.7	985.8	200
Urban			414	626.4	939.2	1393	236
Rural			312.8	424	641.1	886.9	184
Agriculture, forestry and fishing			103.7	120.9	176.6	168.5	62
Non-agriculture, forestry and fishing			60.5	88.4	124.8	220	264
Quintile 1	78.9	104.9	122.4	166.2	249.3	308.9	152
Quintile 5	512.8	503.4	665.4	938.2	1441	2218.9	233

Source Quang Nam statistical yearbook 2010 and 2004

substantial, even for the poorest households, the two groups' perceptions about the extent to which their livelihoods have improved do not reflect this. According to our household survey, 83 % of the richest households perceived that their livelihoods had improved substantially, compared to only 23 % of the poor households. Conversely, 31 % of the poorest households felt that their living standards had deteriorated substantially, which could be explained by the decline in social support for the socially most vulnerable groups.[4]

Paradoxes in Vietnam's strategy to reduce vulnerability towards predicted adverse climatic changes arise from a number of factors: the extreme weather conditions that already prevail in the South Central Coastal Region and Quang Nam Province; the predicted increase in climate variability and extremes; and the rapid transformation from reliance on agriculture, forestry and fishing to becoming an emerging industrial society with rapid economic growth and socio-economic differentiation. These issues will be analysed in the following section.

5 Adaptation Capabilities: Paradoxes Resulting from Economic Growth and Socio-Economic Differentiation

With the inevitable growing demand for energy, and the favourable conditions (seen from a power production point of view) for hydropower generation in the Central Highlands of Vietnam, the number of hydropower projects will undoubtedly increase in the future, as will their accompanying social and environmental problems. Increased power production will fuel further transition of the growing

[4] Results of a household survey of 166 households in five districts in Quang Nam Province, carried out by the research project in 2009–2010.

economy, thereby enhancing social resilience against adverse weather conditions. The paradox is that by enhancing social resilience, the hydropower projects and the management of the water reservoirs also increase ecological vulnerability by exacerbating flooding during excessive rains and making the amount of water available for irrigation scarce during droughts. At the same time, the construction of water reservoirs for the hydropower projects is threatening endangered species of plants and animals, as described above. The clearing of land to make room for water reservoirs simultaneously creates social problems, especially for vulnerable ethnic minorities in the Highlands who have been evicted from their land.

Another paradox stems from socio-economic differentiation, as richer households invest in multi-storeyed concrete houses (83.3 %) and are thereby safer in terms of human security and health during flooding or heavy storms. This contrasts with the poorer households, none of which were living in multi-storey concrete houses and whose life and health was consequently much more at risk during extreme weather events. But, according to the abovementioned household survey, 38.5 % of poorer households have become more dependent on agriculture, and none have become less dependent on it over the last ten years. Conversely, among richer households, 83.3 % had become less dependent on agriculture, or had observed no change. Even though extreme weather events threaten poorer households' life and safety and destroy their crops, the latter regarded lack of access to land and employment as a greater threat to their livelihoods than climate drivers. Rich households, however, perceived climate change as the biggest threat to their livelihoods even though they were safer during extreme weather conditions and less dependent on agriculture, due to the fact that extreme weather events such as storms and excessive rains had the potential to ruin their substantial investments in high income earning activities, such as acacia plantations in the Midlands and Highlands and shrimp farms in the Lowlands (Buch-Hansen 2013).

6 Conclusions

The rapid economic growth which has taken place within the past 10–15 years following the economic transformation in Vietnam in general since *Doi Moi*, and in Quang Nam Province specifically, has greatly enhanced social resilience against extreme weather conditions. The contribution to the economy by agriculture, forestry and fishery, the sectors most volatile to extreme weather conditions, has dropped to about 20 %, even though more than 50 % of the workforce in Quang Nam Province earn their incomes from these primary production sectors. The increased social differentiation, however, has also led to changes in different social groups' ability to adapt to extreme weather conditions: rich households have built strong, concrete multi-storey houses, making them safer during extreme weather events, while the vast majority of poor, rural households live in poorly constructed mud and brick one-storey houses, vulnerable to storms and floods.

The rapid societal transition currently underway in Vietnam, which has been especially dramatic in Quang Nam Province since the turn of the Millennium, has

generated considerable concern about the region's increasing market orientation and market dependency. Legal reforms have also sparked worries about rights and access to land. At the same time, new hydropower projects with huge water reservoirs are springing up all over the province. These, together with widespread deforestation, contribute to major man-made environmental changes which exacerbate the adverse impacts of extreme weather conditions (International Centre for Environmental Management 2006; VietNamNet 2012b). The predicted increase in climate variability and extremes is, however, often perceived as the main future culprit for natural disasters created by extreme weather conditions and hence for slowing down economic development. This development scenario is what creates some of the paradoxes in different groups' ability to adapt to extreme weather situations. On the one hand, hydropower projects greatly contribute to economic growth and thereby enhance social resilience against extreme weather conditions but, on the other hand, they contribute to flooding during heavy precipitation and they reduce the amount of water available for irrigation during droughts (Personal communication with high-ranking officers from Quang Nam Province in October–November, 2011).

The other paradox is that richer households which are more secure in terms of life and health during extreme weather conditions, perceive climate change as a bigger risk to their livelihoods due to the risk of losing major investments in fragile high income generating activities like acacia plantations and shrimp farming. Conversely, poorer households are more concerned with their lack of access to land and employment, which they perceive as a bigger obstacle to improving their livelihoods than climate change drivers, even though they are more vulnerable during extreme weather events.

The above discussion strongly suggests that continued economic growth, and the resulting increase in socio-economic differentiation, will further differentiate various groups' ability to adapt to the predicted increase in climate variability and extremes. Vietnam and Quang Nam Province will be in a better position to invest in infrastructure to enhance ecological resilience, such as better roads and higher bridges that will ensure transport of high value products for the market and assist those who can afford a car. Likewise, building dykes can help protect shrimp farms that are normally constructed close to the coastline and are consequently vulnerable to rising sea levels and heavy storms. Enhancing the capabilities of the poor to adapt to more extreme weather situations thus entails focussing on general development initiatives that will improve their on-farm production and incomes through better access to land and off-farm incomes. This will enhance their social resilience and thereby empower them to adapt to climate changes.

The rapid economic growth that has hitherto enhanced social resilience against extreme climate conditions is, however, being questioned as economic growth is no longer living up to expectations. GDP growth in 2010 and 2011 was only 6.8 and 5.9 % respectively, compared to the Government's prediction of 7–7.5 %. Inflation exceeded 20 % in 2011, giving Vietnam the lead in inflation among Asian countries for the second time in three years. This malaise is commonly attributed to poorly run, corrupt and wasteful state owned enterprises and a general failure to

enhance labour productivity, which have prevented Vietnam from moving up the value chain, leaving countries like Cambodia and Bangladesh to undercut Vietnam in cheap manufacturing (The Economist 2012).

As social differentiation is unlikely to diminish soon, and if economic growth slows down seriously, we will see decreasing social resilience against increasing climate variability and extremes, especially among the poorer segments of the population, which will aggravate social differentiation and, in turn, lead to even greater vulnerability to climate extremes.

While Vietnam's contribution to global greenhouse gas emissions is still minor, it must be acknowledged that these are not the sole root causes of natural disasters which are often conveniently blamed on climate changes and international climate negotiations. The environmental and socio-economic impacts of the present extreme weather conditions, as well as the predicted increase in climate variability and extremes, are also very closely related to man-made environmental changes such as deforestation, water reservoir construction, and the destruction of coral reefs and mangrove forests for increased aquaculture production, all matters that are entirely in the hands of the Vietnamese themselves.

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