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42101

ACEH POVERTY ASSESSMENT 2008



THE IMPACT OF THE CONFLICT, THE TSUNAMI AND RECONSTRUCTION ON POVERTY IN ACEH



Badan Rehabilitasi & Rekonstruksi



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Printed in January 2008.

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Foreword

The 2004 earthquake and tsunami transformed Aceh forever. The tsunami devastated the Acehnese, who already had the misfortune of suffering a 30-year conflict and seen their province slide from relative prosperity in the 1970s to one of the poorest in Indonesia, notwithstanding its rich gas and other natural resources. The massive outpouring of aid and solidarity — both domestic and international — in the wake of the tsunami not only provided crucial relief and emergency assistance, but also created a window of opportunity to transform the political environment. Both the Government of Indonesia and the people of Aceh seized the opportunity: the Government of Indonesia and GAM signed a historic peace agreement and this ultimately led to former GAM members winning seats in free and fair elections in provincial and many district administrations. It is difficult to imagine a more remarkable and inspiring turnaround in a region that only three years ago had been cut off from the outside world.

The reconstruction effort is now focusing on long-term and sustainable development, including the strengthening of institutions and communities so that these can play a decisive role in Aceh's future. The World Bank, with the financial support of the Danish International Development Assistance, is supporting the Government of Aceh and the Reconstruction and Rehabilitating Agency in their efforts to promote sustainable economic development. Such development needs to be broad-based and ensure the well-being not only of all Acehnese today, but also future generations of Acehnese. As part of that support, this report aims to better understand the poverty dynamics in Aceh both pre- and post-tsunami. The impact of the conflict, the tsunami and the reconstruction effort on poverty are therefore three constants that run through the report.

Poverty in Aceh, while still far higher than in the rest of Indonesia, increased only slightly in 2005 — an achievement given the magnitude of the disaster. Poverty then declined in 2006 to below pre-tsunami levels and economic growth started to recover, reversing a trend of increasing poverty and stagnant economic growth. Credit for this turnaround should go first and foremost to the stoicism of the Acehnese. Helping to shelter each other in the immediate aftermath of the tsunami, they then started the task of rebuilding their lives and grasping the chance for peace. The central and regional governments also deserve credit despite the adversity in overseeing one of the largest reconstruction efforts ever witnessed — and one that has worked remarkably well. Finally, the international and NGO communities should also be encouraged by events in Aceh. They assisted the Government of Indonesia in averting a major humanitarian crisis and have been reliable partners to central and regional authorities in rebuilding the province.



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Acknowledgments

This report has been prepared as part of the work program entitled 'Poverty and Sustainable Economic Development in Aceh', which is supported by a Trust Fund from the Danish International Development Assistance (DANIDA). The team would like to thank DANIDA for its generous support. This work program encompasses the preparation of several policy notes (of which this report is the first) that offer advice to the Government of Aceh and the Reconstruction and Rehabilitation Agency for Aceh and Nias (BRR) on sustainable economic development in Aceh, together with the monitoring of economic fundamentals and the facilitation of discussion fora. The report was prepared by a team led by Enrique Blanco Armas and included Jed Friedman and Ellen Tan. Sukmawah Yuningsih provided research assistance. Owin Jamasy from the Laboratorium Ilmu dan Pengkajian Pembangunan Indonesia (Lippi) conducted Focus Group Discussions for this report. The team was supervised by Wolfgang Fengler, who was key in putting together the work program to advise the Government of Aceh and BRR, supporting the team in its efforts and providing valuable inputs on several drafts of the report.

Joel Hellman, Josef Leitmann, Christian Rey and William Wallace have supported this project, advised the team and provided valuable input. Comments on an earlier version of the report were received by Ahya Ihsan, Diane Zhang, David Newhouse and Tim Bulman. Mikko Ollikainen and Harry Masyrafah also provided valuable inputs along the way. Overall guidance was provided by Indermit Gill, Vikram Nehru and Joachim von Amsberg. The peer reviewers were Kaz Kuroda and Ambar Narayan. Sarah Cliffe and Tara Vishwanath offered their valuable advice as peer reviewers in the early stages of this work. Peter Milne, Arsianti and Sylvia Njotomihardjo helped with the editing and production of the report.

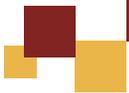
We would also like to thank Pak Marwan Abbas and Pak Abdul Hakim from the Central Statistics Agency (BPS) in Aceh for their time, insights and discussion on the poverty estimates included in this report.

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Glossary of Terms

Bappenas	National Development Planning Agency (Badan Perencanaan dan Pembangunan Daerah)
BLT	Direct Cash Transfer Program (Bantuan Langsung Tunai)
BPS	Central Bureau of Statistics (Badan Pusat Statistik)
BRA	Reintegration Agency for Aceh (Badan Reintegasi Aceh)
BRR	Rehabilitation and Reconstruction Agency (Badan Rehabilitasi dan Rekonstruksi)
Bupati	District head
Dana Otsus	Special Autonomy Fund (Dana Otonomi Khusus)
DAU	General Allocation Fund (Dana Alokasi Umum)
GAM	Free Aceh Movement (Gerakan Aceh Merdeka)
GDP	Gross Domestic Product
IDPs	Internally Displaced People
Kabupaten	District
KDP	Kecamatan Development Project
Kecamatan	Sub-district
Kota	City
LOGA	Law of Governance in Aceh
NGOs	Non-Governmental Organization
PISA	Program for International Student Assessment
PPS	Probability Proportional to Size
Puskesmas	Community Health Center (Pusat Kesehatan Masyarakat)
SD	Primary School (Sekolah Dasar)
SMA	Senior High School (Sekolah Menengah Atas)
SMP	Junior High School (Sekolah Menengah Umum)
STAR	Study of the Tsunami Aftermath and Recovery
Susenas	National Socio-Economic Survey (Survei Sosial Ekonomi Nasional)



EXECUTIVE SUMMARY

1

The 2004 Indian Ocean earthquake and tsunami caused devastating damage and loss in Aceh, both in economic and human terms. The global community, led by the Indonesian government, mobilized a reconstruction effort on an unprecedented scale for a developing country. Concurrent with these developments, and in part galvanized by the trauma of the tsunami, an historic peace agreement was reached between the Government of Indonesia and the Free Aceh Movement (GAM). Three years into the reconstruction effort, with vast amounts of aid having been spent, this reports aims to shed some light on questions regarding the ability of the early relief and reconstruction effort to alleviate poverty in Aceh. This report aims to offer the provincial government in Aceh and the reconstruction agency (BRR) a clearer picture of poverty in the post-conflict and tsunami environment in order to allow them to better design policies and programs to alleviate poverty in the province. In addition, it is important for the international community to gain a better understanding of poverty in Aceh post-tsunami, as the international community may well face similar disasters and the need for major reconstruction efforts in the future.

Poverty in Aceh increased slightly in the aftermath of the tsunami, from 28.4 percent in 2004 to 32.6 percent in 2005. This occurred against falling poverty levels in the rest of the country. This increase is relatively small, given the extent of damage and destruction caused by the tsunami and may reflect the beneficial effects of the initial reconstruction effort.

Poverty fell in 2006 to 26.5 percent, below the pre-tsunami level, suggesting that the rise in tsunami-related poverty was short lived and reconstruction activities most probably facilitated this decline. The poverty level in Aceh declined in 2006 as it went up in the rest of the country. Nevertheless, poverty in Aceh remains significantly higher than in the rest of Indonesia.

Poverty was higher in both tsunami- and conflict-affected areas in the immediate aftermath of the tsunami. By 2006, poverty in tsunami and non-tsunami affected areas appeared to equalize and the impact of the conflict on poverty declined in 2006. District level poverty data show that areas with the highest poverty levels are in the rural interior and more remote districts, while areas around Banda Aceh have some of the lowest observed poverty levels. Analysis of transitions in and out of poverty has identified some of the factors that assisted households in escaping poverty, such as having a non-farm business, crop diversification, disaster assistance or the education of the household head.

Poverty in Aceh is predominantly a rural phenomenon, with over 30 percent of rural households living below the poverty line. This compares with less than 15 percent of poor households in urban areas. Other characteristics associated with higher poverty levels are larger household sizes, lower education levels, female-headed households and households that predominantly work in agriculture. The relationship between these characteristics and poverty remained relatively stable over the tsunami period suggesting that underlying determinants of poverty were unchanged despite the rapid socio-economic and political changes.

There appear to be two overlapping but distinctly vulnerable groups: the structurally poor, i.e. those that were poor before the tsunami, and the “shocked”, who suffered loss of private goods and assets due to the tsunami. Many of the shocked retain certain productive capacities, such as their own education and savings they could use to smooth consumption, which the structurally poor lack. The activities of development actors need to distinguish between these two groups when designing projects and policies.

Aceh has experienced very low or negative growth rates for most of the past three decades, lagging behind Indonesia and North Sumatra in most years. The main reason for this slower growth was the longstanding conflict affecting the province, although structural economic deficiencies also contributed to the economy's poor performance. As a result, Aceh has poverty levels well above those seen in most other regions in Indonesia. High GDP per capita in Aceh, primarily the result of the large gas and oil reserves on Aceh's east coast, has not translated into lower poverty levels. Given that poverty is predominantly a rural phenomenon, pro-poor growth will entail promoting growth in agriculture, through increasing the productivity of farmers, removing constraints to growth in rural areas (such as lack of access to finance), improving rural infrastructure and the access to markets for farmers as well as facilitating the movement of the rural population towards growth poles in urban areas.

The abundance of natural resources in Aceh has not resulted in higher growth rates or lower poverty levels.

In fact, resource wealth is closely linked to the conflict that has blighted Aceh over the past 30 years and resulted in a struggling economy, weaker government, low levels of public services delivery as well as some of the highest poverty levels in Indonesia. Natural resources do not necessarily have to lead to conflict. Enlightened policy-making can help to reduce the likelihood that resources will generate conflict, such as investing in health and education, diversifying the economy away from an over-reliance on natural resources, increasing the transparency of the distribution and use of revenues from natural resources, ensuring the rule of law in the province.

The Government of Aceh will have large fiscal resources in the near future to combat poverty and improve public service delivery.

Since 1999, Aceh's regular revenues managed by the province and local governments have increased by over 500 percent. Central government transfers are projected to increase as the Law on Governing Aceh (Law No. 11/2006, known as LOGA) is implemented. Following the December 2004 tsunami, Aceh received an unprecedented amount of assistance from the Indonesian government and the international community, estimated at about US\$7.5 billion over a period of five years. Given the new reality of decentralized spending and responsibilities (e.g. health, education and infrastructure), the well-being of the Acehnese is now largely in the hands of the local government. Improving spending patterns and the quality of local government staff will be key to alleviating poverty in Aceh.

Aceh has some of the largest per capita public spending in both education and health. This has not translated into significantly better social outcomes in these two sectors when compared with the rest of Indonesia, although it seems to have lowered private out-of-pocket spending of the Acehnese on health and education. This is true for both the poorer and richer segments of the society. Improving the targeting of spending towards the poorer segments of the population as well as improving spending patterns (particularly an increasing civil service wage bill that does not seem to be addressing the key constraints to better public service delivery), will increase efficiency and allow for better outcomes within the given budgets.

Priorities for alleviating poverty in Aceh

- Longer-term development efforts should focus on the poorest areas of Aceh, in particular those in the rural interior and more remote areas. The current concentration of resources in tsunami-affected areas, particularly Banda Aceh and areas close to the capital, should be broadened to cover other areas affected by the conflict.
- Any poverty alleviation strategy should focus on increasing the productivity of the agricultural and fisheries sectors. This should be linked to a strategy to improve the capabilities of the poor (skills development, rehabilitation of physical assets) and link them to growth poles in urban areas (better rural infrastructure and access to markets).
- In order to avoid any renewal of the conflict, which historically has been closely linked to natural-resource wealth, the Government of Aceh can (i) diversify the economy away from natural resources, (ii) increase transparency of the distribution and use of revenues, and (iii) ensure the rule of law.
- The Government of Aceh should invest in a strong civil service that ensures an efficient allocation of resources, as well as the provision of quality public services. Strengthening local administrations is more urgent in Aceh than in other regions of Indonesia, given the difficult tasks that lie ahead, managing one of the largest reconstruction efforts in the world and dealing with the negative heritage of a 30-year conflict.
- The Government of Aceh should scrutinize spending patterns, such as the increased spending on government administration and the civil service wage bill.
- The Government of Aceh should continue its high levels of investment in education, increasing the efficiency of spending. Secondary and tertiary education, closely related to lower poverty levels, should be part of the poverty reduction strategy of the Government of Aceh.
- Better planning is necessary to match identified needs and allocation of resources in key sectors. Current spending patterns, with a focus on building new facilities and an already large number of public employees, are failing to address the poor quality of service delivery and the low allocation of resources to the operation and maintenance of public facilities and infrastructure.



UNDERSTANDING POVERTY IN ACEH

2

Key Findings

- Poverty in Aceh pre-tsunami, at 28.4 percent of the population in 2004, was substantially higher than in the rest of Indonesia, at 16.7 percent. Poverty in Aceh increased in the aftermath of the tsunami to 32.6 percent. Poverty levels had declined below pre-tsunami levels to 26.5 percent by 2006, facilitated by the reconstruction activities and the end of the conflict.
- The slight rise in poverty over the tsunami period masks a good deal of underlying heterogeneity across different areas of Aceh. Tsunami-affected areas did experience an increase in poverty over the tsunami period but then returned, or even improved upon, the pre-tsunami poverty levels by 2006. The ability to smooth consumption through dis-savings certainly helped selected households through this difficult transition, as did the receipt of disaster assistance. Poverty in the conflict-affected areas remained high throughout this period but had also experienced a marked decline by 2006.
- The number of vulnerable people in Aceh is very high, such that a small shock could send them into poverty. On the other hand, many people are just below the poverty line so well-targeted interventions or broad-based growth may quickly reduce the overall numbers of poor.
- Poverty in Aceh is predominantly a rural phenomenon, with about 30 percent of rural households living below the poverty line, compared with less than 15 percent in urban areas. Geographically, those districts closest to Banda Aceh had lower poverty levels, while districts in Central and Southern Aceh show higher poverty levels. Lower education levels, as well as agriculture as the main household activity, are also positively associated with poverty.
- There are two overlapping but distinctly vulnerable groups in Aceh: the 'structurally poor' and those 'shocked' by the tsunami, who suffered loss of private goods and assets. Many of the 'shocked' retained certain productive capacities, such as their own education, that are in shorter supply among the 'structurally poor'. Given this typology, as well as the limited public funds available for poverty alleviation, Aceh must now consider which public investments will result in the greatest gains in poverty alleviation going forward. The 'shocked' will be helped best by rehabilitating assets lost and accelerating the process by which they can regain their ability to earn a living. Assisting the 'structurally poor' entails a different type of intervention — one aimed at increasing their ability to engage in economic activities (i.e. human capital, physical assets).

Box 2.1 Defining poverty

Poverty is a multi-dimensional construct of human welfare that encompasses many traditional measures of well-being, such as income, health, and security. Household consumption is widely viewed by economists as a broad summary measure of available household resources and, hence, is the preferred dimension with which to begin a study of poverty. In most settings, consumption is more directly related to overall well-being than is income, as it tends to be more stable over time, especially over disruptive but relatively short periods like the 1997 Indonesian economic crisis or, possibly, the 2004 tsunami. Alternative welfare dimensions, such as health and education, will also be considered in this report. The aim of this chapter is to record how consumption poverty has responded to the events over the past few years — a brief but turbulent period in Aceh's history. Poverty is estimated principally with Indonesia's National Socio-economic Survey, or Susenas, a large-scale survey fielded annually by the Central Statistics Agency (BPS), and supplementary analysis will come from the Study of the Tsunami Aftermath and Reconstruction, or STAR,¹ a special-purpose longitudinal survey that re-contacts a selection of 2004 Susenas households with an extensive questionnaire one year later.² Susenas samples households from every district in Aceh, thus enabling provincial level inferences. STAR focuses only on households in coastal districts that experienced tsunami damage and hence can only represent the poverty levels in those areas, but it can also look more closely at determinants of poverty change over the tsunami period due to its longitudinal nature. For a comprehensive methodological note on the methodology used to estimate poverty in Aceh see Annex B2.

According to official figures, in 2004 overall poverty level in Aceh — 28.4 percent — was substantially higher than in Indonesia as a whole, where the poverty level stood at 16.7 percent. It is also higher than its neighboring province, North Sumatra, where poverty was relatively low at 14.9 percent. In 2004, poverty was 17.6 percent in Acehese urban areas and 32.6 percent in rural areas. Although this report focuses on the immediate poverty impacts of the tsunami, the persistence of high poverty in Aceh from before the tsunami period presents a long standing policy challenge to the Government of Aceh.

The tsunami resulted in a relatively small increase in poverty in Aceh. Poverty in Aceh increased slightly for both urban and rural areas from 2004 to 2005, from 17.6 to 20.4 percent in urban areas and 32.6 to 36.2 percent in rural areas (Table 2.1). The observed poverty increases are statistically significant at conventional levels. This rise in poverty levels occurred while poverty in Indonesia as a whole declined from 16.7 percent in 2004 to 16.0 percent in 2005. Since the two Susenas surveys were fielded in February 2004 and December 2005, this poverty comparison relates to a period 10 months before the tsunami to a period one year afterwards. Given this lag, it may miss important short-term dynamics in the poverty rate and, in particular, a potentially sharper rise in poverty in the immediate aftermath of the tsunami. If there was such an increase it was relatively short-lived. The relatively low poverty increase in 2005 likely reflects the beneficial effects of the initial relief and reconstruction effort, as well as the ability of households to smooth consumption through savings and extended networks when faced with income shocks.

Table 2.1 Poverty levels in Aceh fell in 2006

	2004	2005	2006
	%	%	%
Aceh Province	28.4	32.6	26.5
Urban	17.6	20.4	14.7
Rural	32.6	36.2	30.1
Indonesia	16.7	16.0	17.8

Source: BPS data and World Bank staff calculations.

1 For a methodological note on the STAR survey see Annex B6.

2 Susenas surveyed 10,190 Acehese households 2004, 10,941 in 2005, and 10,975 in 2006. The STAR data contain 5,300 households.

Box 2.2 Data constraints in a conflict and disaster setting

The collection of high-quality complex socio-economic information at the household level is a great challenge even in the best of times. This activity becomes a much more difficult task when conducted under conditions of conflict — as experienced in Aceh in 2004 — or in the aftermath of a natural disaster — again, as experienced in Aceh in 2005-06. The fact that analysts have the Susenas core for the 2004-06 period on which to base the empirics of this report speaks to the high level of professionalism and effort of BPS. There is always a good deal of variability when comparing estimates from small samples such as those found at the district level in the Susenas surveys. While in principle Susenas is representative at the district level, the unique data collection challenges faced in Aceh most likely added an additional source of variability. For this reason, the report focuses on inferences at the province (or at times large groupings of districts) rather than at the district level since the law of large numbers ensures more stable inferences at this higher level of aggregation.

There is a natural interest to understand the path of poverty at the very local level in Aceh. However, data difficulties prevent analysts from exploring local level changes in depth. One reason has been mentioned just above. Another concerns the lack of local price change measures. As explained in more detail in Annex B2, only two urban centers in Aceh yielded price information at a sufficient degree of detail needed for the poverty analysis in this report. Thus, it is impossible to assign differential price changes to local areas below the provincial level without the use of ad hoc assumptions. Other sources of data, such as STAR, can be and are used to supplement the analysis. However, each source also has its limitations. In the case of STAR, the data are quite detailed but only contain information for households in tsunami-affected districts of Aceh (as opposed to the full provincial coverage of Susenas). STAR also lacks sufficient price change information at the local level. Nevertheless, the findings across varied data sources reveal a consistent picture of poverty change and its associated characteristics. Despite the data limitations, meaningful and robust poverty inferences can be made for Aceh over the period studied.

The poverty situation improved from 2005 to 2006 as provincial poverty levels fell below those observed in 2004. The rise in tsunami-related poverty was relatively brief and reconstruction activities most probably facilitated this decline. This pattern of a rise and then recovery in poverty levels in the Susenas survey is echoed in the STAR data that record the important role of savings in consumption-smoothing and hence protection against poverty. Community leaders in every sampled STAR village were asked about changes in savings behavior over the tsunami period. Table 2.2 shows the significant declines in overall savings in the heavily tsunami-affected areas whereas in unaffected areas there was no noticeable change in savings behavior. As conditions improved from 2005 to 2006, the incidence of savings rebounded indicating the beginning of recovery and the replenishment of assets.

Table 2.2 Percentage of STAR villages where saving with a given asset is common

Asset	Heavily damaged villages			All villages		
	2004	2005	Change	2004	2005	Change
	%	%	%	%	%	%
Gold/jewelry	74.7	52.6	-22.1**	58.2	50.1	-8.1*
Land	46.3	24.2	-22.1*	34.7	28.2	-6.5**
Livestock	30.5	12.6	-17.9**	31.9	26.6	-5.3**
Stores of grain	15.8	6.3	-9.5**	15.9	12.8	-3.1**
House	18.9	8.4	-10.5**	7.6	5.0	-2.6*
Savings account	85.3	68.4	-16.9**	70.8	65.5	-5.3**
Arisan*	32.6	17.9	-14.7**	25.8	22.5	-3.3**

Table 2.2 (continued)

Asset	Heavily damaged villages			All villages		
	2005	2006	Change	2005	2006	Change
	%	%	%	%	%	%
Gold/jewelry	51.5	77.9	26.4**	52.4	70.7	18.3*
Land	25.0	29.4	4.4	29.8	38.9	9.1*
Livestock	16.2	10.3	-5.9	32.2	28.8	-3.4
Stores of grain	1.5	1.5	0.0	10.1	13.0	2.9
House	11.8	16.2	4.4	7.2	8.2	1.0
Savings account	67.6	86.8	19.2*	69.2	77.9	8.7*
Arisan ¹	16.2	29.4	13.2*	17.3	36.5	19.**

Source: STAR data and World Bank staff calculations (502 villages comprise the 04-05 comparison and 466 villages comprise the 05-06 comparison).

Note: ¹Arisan is the Indonesian term for regular social gatherings where members contribute to, and take turns at, winning an aggregate sum of money. *Significant at the 10% level, ** at the 5% level.

Poverty increases in 2005 were much more pronounced in areas heavily affected by the tsunami or the conflict.³ While poverty rose slightly in 2005 and then declined for the province as a whole, the poverty response to the tsunami was not uniform across the different areas of Aceh. Significantly larger increases in poverty occurred in the heavily tsunami-affected areas as well as areas, emerging from conflict.⁴ *Kecamatan* are sorted into two categories of potentially overlapping groups: those areas with or without significant tsunami damage and those areas with or without conflict (see Annex for methodological notes on the construction of the tsunami- and conflict-intensity indexes). Table 2.3 reports the likelihood of households in high tsunami- or conflict-affected *kecamatan* being poor relative to households in low tsunami and conflict affected *kecamatan* (for results of the estimation including controls see Table 4A in the annex). In 2004, households in soon-to-be-tsunami-affected areas were less likely to be poor as those in areas that did not suffer direct tsunami impact — the tsunami affected areas were relatively well-off areas in Aceh before the disaster. The effect of the tsunami is evident in the following year, when the relative likelihood of poverty increases substantially in the directly affected areas so that households in those areas are 44 percent more likely to be poor than those in *kecamatan* not affected by the tsunami.

Table 2.3 Relative odds of poverty by kecamatan classification of high or low tsunami and high or low conflict, 2004-06

	2004	2005	2006
High tsunami	0.83**	1.44***	1.08
Low tsunami	1.00	1.00	1.00
High conflict	1.29***	1.43***	0.96
Low conflict	1.00	1.00	1.00

Source: BPS data and World Bank staff calculations.

Note: Estimates include controls for household observables: age, gender, education, and occupation of household head as well as household size. These estimates are based on kecamatan in the kabupaten and exclude kecamatan in the kota (Banda Aceh, Sabang, Lhokseumawe and Langsa). * Significant at the 10% level, ** at the 5% level, *** at 1% level.

3 For an assessment of the causes underlying the conflict see Schulze, 2004. She argues that at the center of the conflict are the dysfunctional center/periphery relationship between Jakarta and Aceh as well as the profound Acehnese alienation from Jakarta. A strong ethnic and religious identity in Aceh and the will to protect it as well as centralistic policies from Jakarta contributed to the exacerbation of the conflict.

4 For methodology on how to categorize districts as heavily affected by the tsunami or the conflict please see methodological Annexes B3 and B4.

The impact of the tsunami on poverty levels was short lived. The impact of the conflict on poverty also seemed to decrease by 2006. Recovery of households in tsunami-affected areas appears to be rapid — by 2006 there was no significant difference in poverty likelihood across areas directly affected by the tsunami and those unaffected. The impact of the conflict on poverty also seemed to have disappeared by 2006. In 2004, households in conflict areas were 29 percent more likely to be poor. This relative difference increased to 43 percent in 2005 but had disappeared in 2006 possibly suggesting that benefits from the end of conflict are beginning to emerge in those areas as well. Average per capita consumption data also support the finding that conflict-affected areas had started to recover by 2006 (Figures 2.1 and Figure 2.2 below).

Figure 2.1 Average per capita consumption by tsunami intensity

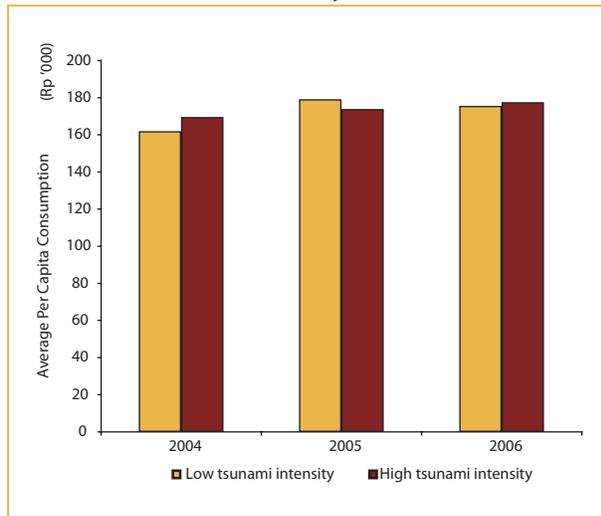
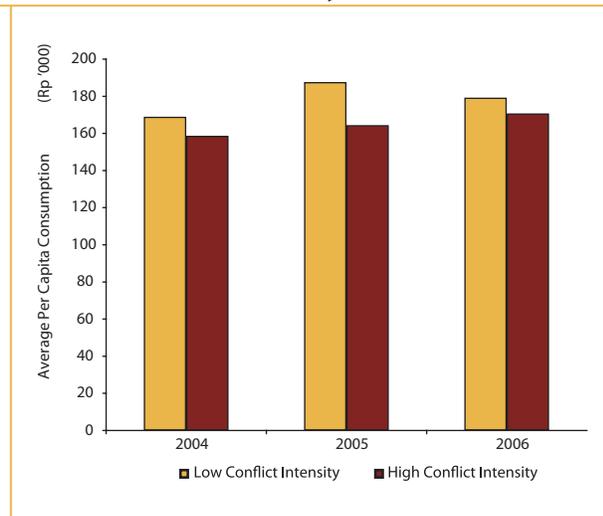


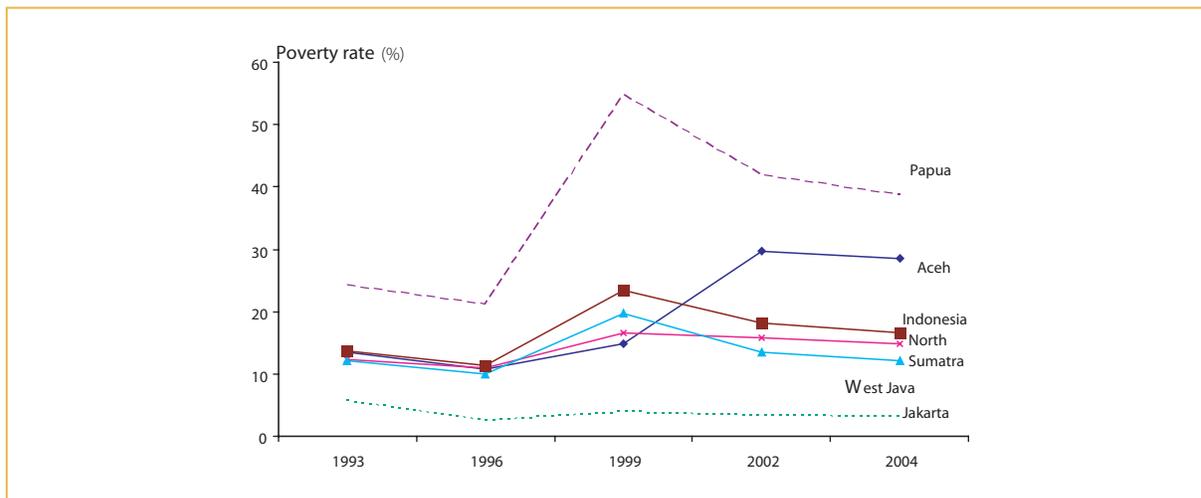
Figure 2.2 Average per capita consumption by conflict intensity



Source: BPS data and World Bank staff calculations.

The 30-year conflict had a devastating impact on Aceh. There are a large number of reports and studies analyzing the impact of the conflict on Aceh. Aspinall (2005) estimates that about 15,000 people died in the conflict during its 30-year duration. Aceh's economy, despite being a relatively rich province in terms of natural resources, has systematically grown more slowly than the rest of Indonesia. Poverty rates increased in most provinces after the financial crisis in 1997, but by 2002 they had declined almost to pre-crisis levels (Figure 2.3). Aceh is the only province in which poverty rates continued to increase after 2000, as the conflict entered its third and most brutal phase, turning Aceh into one of the poorest provinces in Indonesia. The next section elaborates in greater detail on Aceh's economy, as well as the causes of the conflict and its impact on the well-being of the Acehnese.

Figure 2.3 Aceh is the only province where poverty has continued to increase



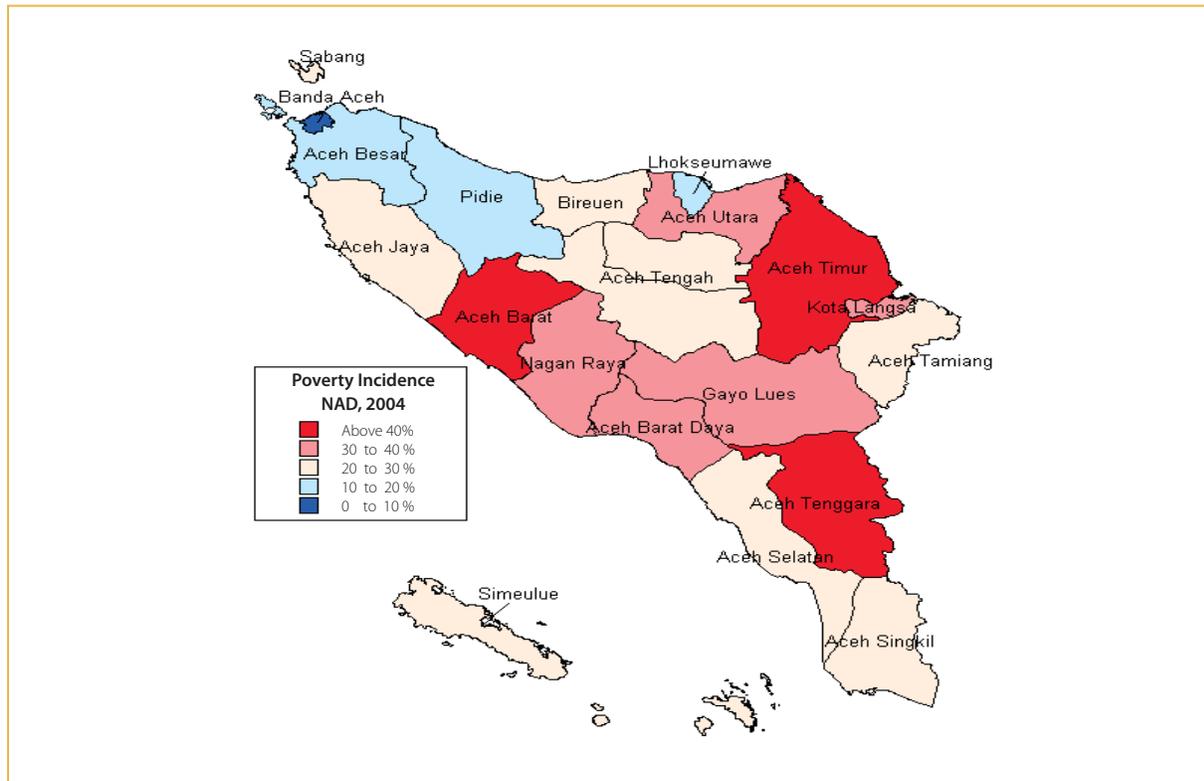
Source: Susenas, 2004.

The 2004 tsunami caused devastating physical damage along Aceh’s coast, with 130,000 confirmed dead and 37,000 still missing. An additional 500,000 people were displaced by the disaster (BRR, 2006). Damage and losses were estimated at US\$4.8 billion⁵ and the productive sector alone suffered damage estimated at US\$1.2 billion, with over 100,000 small businesses destroyed and more than 60,000 farmers at least temporarily displaced. The economy, already battered by the conflict and declining gas resources, contracted by 10 percent in the year after the tsunami. By 2006, the economy was showing very modest growth, the result of economic activities closely linked to the reconstruction effort. The unprecedented response to the tsunami and outpouring of assistance, estimated at US\$7.5 billion over a five-year period, means that in the short term the economy has recovered relatively quickly, with damaged or destroyed infrastructure at least partially repaired and provision of public services partially restored. However, as the next section will show, the rehabilitation of livelihoods, together with sustainable employment generation and economic growth, is proving more problematic, given both structural deficiencies of Aceh’s economy and the enduring impact of the conflict on the productive sector. The success in restoring livelihoods of the population and the ability of the Government of Aceh to address key structural deficiencies of the economy of Aceh will be key for alleviating poverty in the province.

Before the tsunami, poverty levels were significantly lower in Banda Aceh and the *kabupaten* closest to the provincial capital. The slight rise in poverty over the tsunami period masks an underlying heterogeneity across different areas of Aceh — tsunami-affected areas did experience an increase in poverty over the tsunami period but then returned to, or even improved upon, their pre-tsunami poverty levels by 2006. In principle, Susenas is representative of the district level and this allows for valid inference of poverty at that local level. Figure 2.4 presents the spatial distribution of poverty in Aceh in 2004. It reveals that the areas with the highest poverty levels were in the rural interior, while areas around Banda Aceh have some of the lowest observed poverty levels.

⁵ Includes damage in Nias islands and adjusted for inflation. For a more detailed assessment of the damage of the tsunami see the Damage and Loss Assessment prepared by the Government of Indonesia (Bappenas, 2005).

Figure 2.4 2004 Aceh poverty by district



Source: BPS, 2004.

Poverty increased in many districts affected by the tsunami in 2005, but it decreased in most districts in 2006. Figures 2.5 and 2.6 depict the district changes in poverty in 2004-05 and then 2005-06, respectively. Since we lack local measures of price changes, these district poverty changes should be interpreted merely as approximations. Figure 2.5 shows an increase in poverty in many of the coastal districts affected by the tsunami (although not all). However, there is a decline in poverty levels in and around Banda Aceh. Figure 2.6 reveals broad reductions in poverty in most districts although, notably, the poverty in remote Simeulue continued to worsen. Poverty in the conflict-affected areas remained high throughout this period but had also decreased by 2006.

Figure 2.5 Poverty increased in many districts in 2005...

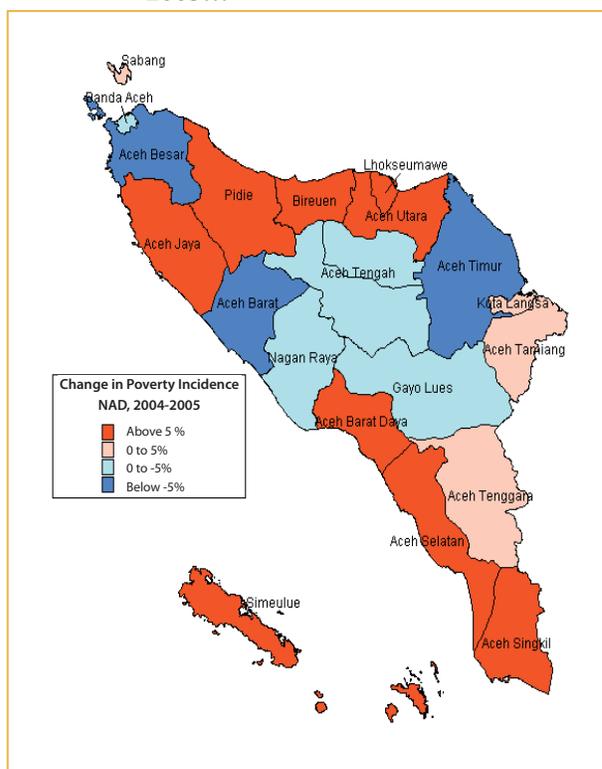
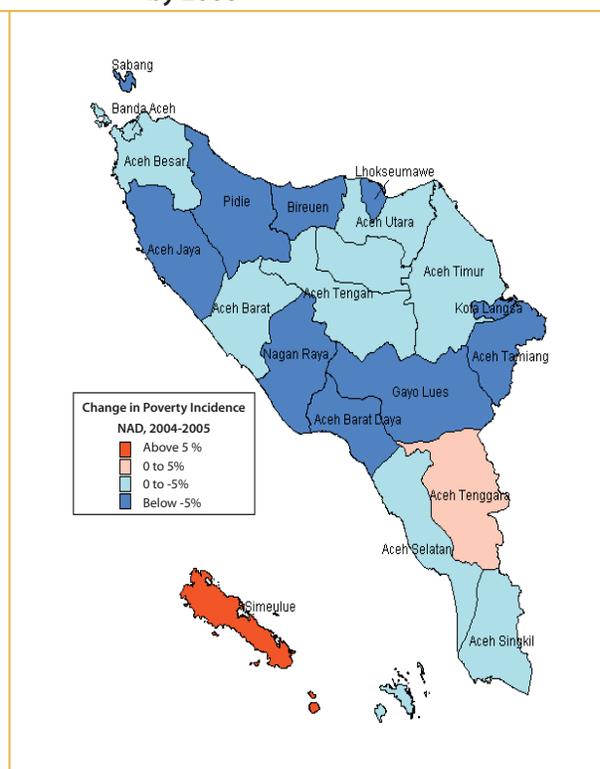


Figure 2.6 ...but was decreasing in most districts by 2006



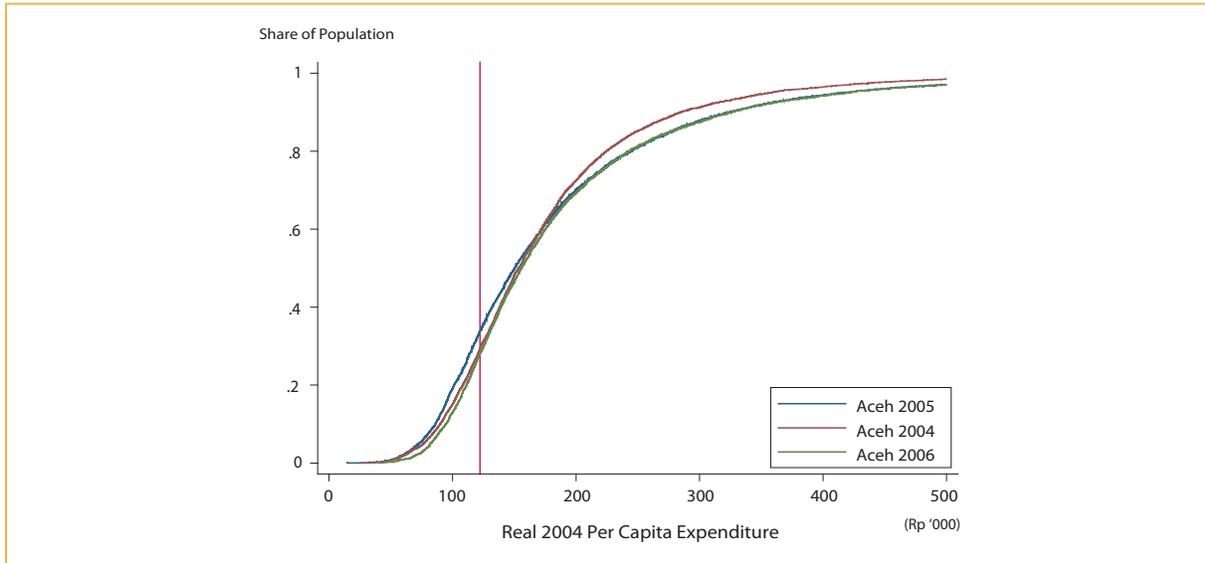
Source: BPS data and World Bank staff calculations.

Similar to the rest of Indonesia, the number of vulnerable people in Aceh — those with monthly consumption close to the poverty line — is very high, so that a small shock could send them into poverty.⁶ The poverty numbers in each of the years are anchored to the 2004 BPS poverty line. An important question concerns the robustness of these findings to other potential poverty lines since a different reference level of welfare may yield a different magnitude of poverty change. The cumulative distribution of household consumption for 2004-06 (Figure 2.7) illustrates the sensitivity of the poverty level to the choice of poverty line. The cumulative distribution functions illustrate the average expenditure (horizontal axis) that is consumed by a share of the population (vertical axis). Shifts to the right represent higher per capita expenditure for a given share of the population. One striking feature in these figures is that the cumulative distributions are very steep around the poverty line. This suggests that measured poverty levels are particularly sensitive to the choice of a specific poverty line. A poverty line just above (or below) the existing line would yield substantially higher (or lower) poverty levels. This situation suggests that many of the people currently classified as non-poor are vulnerable, so even a small shock could send them into poverty.⁷ On the other hand, many people are just below the poverty line, so well-targeted interventions or broad-based growth may quickly reduce the overall numbers of poor.

6 This feature of poverty is the same in the rest of Indonesia. According to World Bank, 2006a, the poverty rate in Indonesia in 2006 was 16.7 percent (with a poverty line of US\$1.55/day), but almost 50 percent of the population lives on less than US\$2/day.

7 The vulnerability of a large share of the population should be taken into account when designing development strategies for the region. Given the province's topography and abundant overall rainfall, low-lying coastal areas often face flooding and other extreme natural conditions, which can be further aggravated by unsustainable land-use practices upstream.

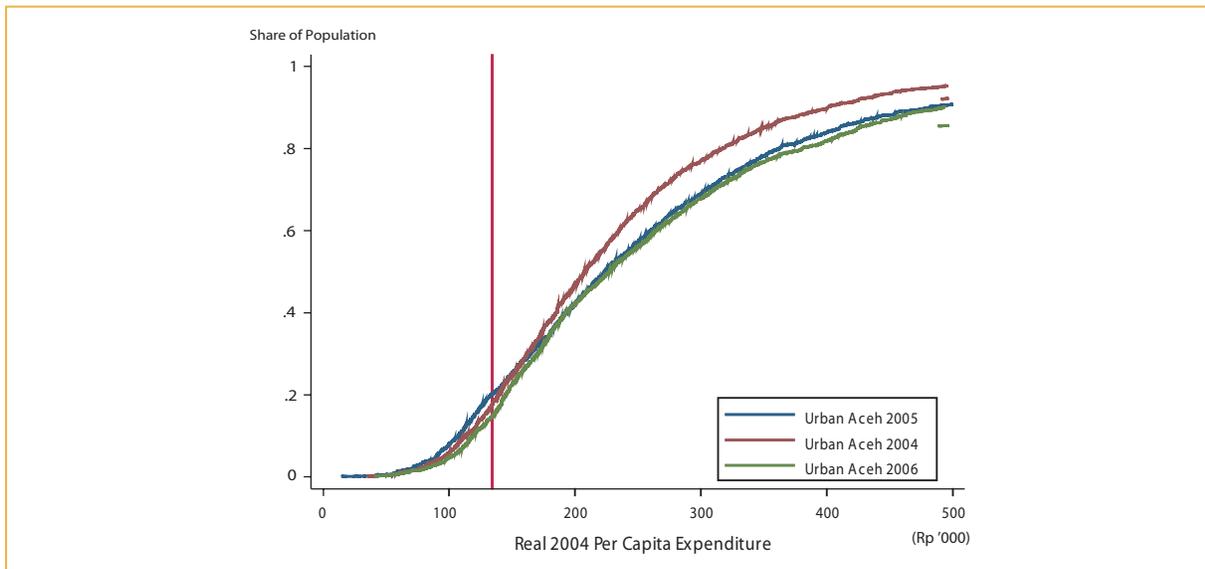
Figure 2.7 Cumulative distribution functions for rural Aceh, 2004-06



Source: BPS data and World Bank staff calculations.

The slight rise in poverty in the aftermath of the tsunami is largely independent of the choice of a particular poverty line. Figure 2.7 shows that poverty lines over a relatively broad range would yield only a small increase or no change in poverty from 2004-05, since the 2005 distribution lies just above the 2004 line for much of the distribution. Thus the finding that poverty rose only slightly over the tsunami period is robust across a wide range of potential poverty lines. However, the 2004 and 2005 lines do cross at higher levels of household consumption. This suggests that the relatively well-off households in 2004 became even richer in 2005. The diverging experiences of the well-off and the poor are even more apparent in urban areas, as seen in Figure 2.8.

Figure 2.8 Cumulative distribution functions for urban Aceh, 2004-06



Source: BPS data and World Bank staff calculations.

Box 2.3 Different methodologies to estimate poverty

There is a relatively small difference between the poverty estimate in 2005 of this report (32.6 percent) and that of BPS in Aceh (28.6 percent).⁸ There are two key divergences in methodology that explain this difference related to (i) the data employed in the analysis and consequent difference in the basket of food and non-food items used to estimate consumption, and (ii) the price index employed to deflate consumption. First and foremost, the poverty estimates in this report are based on the core Susenas data rather than the consumption module that is used to produce the BPS poverty estimate for 2005. This report uses the relatively less detailed consumption information of the Susenas core data in order to allow for a welfare consistent estimate of poverty over the 2004-06 period, while the Susenas consumption module is only available for the single year of 2005. Second, to estimate the price index, BPS uses unit values from the consumption module of the Susenas survey for 52 food and 36 non-food items. This report uses inflation data published by BPS to estimate the deflator, weighted by 19 aggregates of food and non-food items. In addition, BPS also generated alternative estimates of the number of 'poor households' for the distribution of a direct cash transfer program (Bantuan Langsung Tunai, or BLT). In this approach, poor households are defined from 14 criteria that are considered to be pertinent indicators of poverty in Indonesia, such as the type of housing, source of energy used, source of clean water, ownership of assets or saving, etc. For more information on the estimation of poverty by BPS using both Susenas and the Socio-Economic Census see methodological Annex B5. BPS uses the Socio-Economic Census (Pendataan Sosial Ekonomi). In this conceptually distinct framework, 'poor households' include those that are very poor, poor, and near poor. By including all three of these categories, the poverty rate in Aceh reached 49.85 percent in 2005. This measurement includes households that are near poor, which are excluded from the poverty estimates using Susenas of both BPS and this report. Excluding the near poor category and using the Socio-Economic Census by BPS yields a very similar estimate of poverty in Aceh for 2005, at 30.2 percent. There are a very large number of people clustered around the poverty line. Using the core Susenas survey as this report does, a slightly higher poverty line would also yield significantly higher poverty levels similar to those estimated by BPS using the Socio-Economic Census.

Poverty in Aceh is significantly and positively related to living in a rural area and having agriculture as the main occupation of the household. As elsewhere in Indonesia, most poor are rural and work in agriculture. In fact, the overall size of this group may have increased over the tsunami period as some of the population shifted at least temporarily from tsunami-affected towns and cities on the coast towards rural areas. In contrast, economic growth in urban areas under reconstruction led to relatively faster income growth for the better-off (and most likely better educated). Table 2.4 below confirms this by looking into per capita consumption in both urban and rural areas, as well as the increasing urban-rural consumption ratio post-tsunami.

Table 2.4 Urban areas have a higher and increasing average per capita consumption

	2004	2005	2006
Urban (Rp)	239,767	280,182	284,084
Rural (Rp)	153,035	164,894	168,628
Urban-rural consumption ratio (%)	1.57	1.70	1.69

Source: BPS data and World Bank staff calculations.

Other relevant factors related to poverty are low levels of education of the household head, as well as female headed households. Using the full information in Susenas we can explore factors that are related to poverty in Aceh. Table 2.5 shows the direction and the statistical significance of the conditional correlation between

8 A difference of 4 percent in the poverty levels would normally be a source of concern. Given the traumatic events that affected Aceh in December 2004 and its impact on the wellbeing of the population, but particularly on consumption patterns, prices, population movements and data quality, all key variables to estimate poverty, a difference of 4 percent seems relatively small.

household poverty and some observable dimensions of poverty, such as number of household dependents, urban/rural location, and the education, occupation, and gender of the household head. These are the same risk factors associated with poverty in many settings in the rest of Indonesia, and include a high number of dependent household members (mostly children), low education and female-headed households. These significant characteristics of poor households stayed relatively stable over the 2004-06 period, suggesting that the underlying determinants of poverty remained unchanged despite the rapid socio-economic and political changes.⁹ Determinants of poverty are also relatively similar in urban and rural areas, with some differences in the impact of education and household size on poverty (see Tables 2A and 3A in the annex).

Table 2.5 Determinants of household poverty

	2004	2005	2006
Household size	++	++	++
Education household head	--	--	--
Household head female	++	+	n.s.
Rural	++	++	++
Agricultural employment	++	++	++

Source: BPS data and World Bank staff calculations.

Note: +/-/- indicates statistical significance at the 1% or 5% level, +/- significance at the 10% level.

Different household characteristics also allowed some households to cope better with the tsunami. People were able to leverage productive assets and capacities such as human capital and non-farm businesses/employment to escape poverty after the tsunami. Even though the prevailing characteristics of the poor stayed relatively constant over 2004-06, the poor are not a static group: some people exited poverty over 2004-05 and slightly more people entered, hence the rise in the poverty headcount. This pattern was reversed in 2005-06 as slightly more people exited poverty than entered. The STAR data, thanks to their longitudinal character, allow identification of a number of factors that assisted households affected by the tsunami in escaping poverty or prevented them from falling into it. Factors that affected the probability of escaping poverty are:

- **Small household size:** conditional on the mean characteristics of poor households, an increase in one household member reduces the odds of poverty escape by 32 percent;
- **Education:** an increase in one year of schooling for the household head increases the odds of escape by 10 percent;
- **Productive assets:** having a non-farm business increases the likelihood of escape by 100 percent;
- **Crop diversification:** Agricultural households that only grow rice are more vulnerable to entering poverty (30 percent more likely) while those that grow perennials and other crops are 32 percent less likely to enter poverty;
- **Disaster assistance:** the receipt of government aid increases the likelihood of escape by 43 percent; and
- **Disaster assistance:** the receipt of NGO aid reduces the likelihood of entering poverty by 23 percent.

Migration has long been a means to escape deprivation in Aceh, and this once again played a key role in the response of the population to the tsunami. There is evidence that the conflict and the tsunami resulted in a large number of displaced people. Between 1999 and 2002, around 25 percent of all villages in Aceh reported the presence of conflict, and around 13 percent of all villages faced violent conflict. It is difficult to obtain an accurate estimate of the numbers of Acehnese who were displaced in the recent past, but research (Czaika and Kis-Katos, 2007) suggests that around half a million people were displaced by the conflict, and another half a million as a result of the tsunami. Other provinces in Indonesia (particularly North Sumatra), Malaysia and Singapore became home for large Acehnese communities, partly as a result of the better economic opportunities but also to escape the violence

⁹ These results are determined by a logistic regression with numerous linear controls. Table 1A in the annex provides the relative odds of poverty by selected household characteristics.

in Aceh (Missbach, 2007). Human rights organizations report¹⁰ that at the worst period of the conflict, in late 2003, UNHCR estimated that 8,000-9,000 Acehnese had found refuge from the in Malaysia. Internal migration patterns changed as a result of the tsunami. During the conflict, many people left the rural conflict-affected interior and moved to more secure cities on the coast. After the tsunami, they escaped the devastation caused by the tsunami by moving back to their areas of origin, particularly Pidie, North Aceh and East Aceh (Mahdi, 2007). However, the return was short lived for many as most emergency relief was placed in the larger cities in the tsunami-affected areas, forcing those IDPs who were dependent on emergency relief to move back to the coastal areas.

Migration due to the conflict or the tsunami led to a worsening of the well-being of those displaced and many families hosting victims of the conflict and the tsunami. In many cases, migration can lead to higher income if the reasons for migrating are better economic opportunities. However, in Aceh's case, most migration occurred to escape the conflict or the devastation of the tsunami. We can therefore assume that the displaced faced hardship in their new destinations, whether in IDP camps, with families or friends, or outside Aceh. Many displaced people were sheltered by their relatives and friends (over two thirds of all IDPs). This was often done without any institutional assistance, resulting in the burden of the displacement being partly shouldered by families and friends of those affected by the conflict or the tsunami. Large migratory flows are often linked to remittances and a higher level of consumption for those receiving the remittances (Fajnzylber and López, 2007). Data on remittances to Aceh are extremely difficult to obtain, but recent research on the impact of the tsunami on remittances in Aceh argues that although remittances contribute minimally to Aceh's GDP, they still play an important role in consumption smoothing for many families (Wu, 2006). It also suggests that remittances were shortly interrupted in the immediate aftermath of the tsunami, but resumed shortly after as communication networks were restored and migrants were able to locate their families.

Box 2.4 Tsunami experience by poverty status

The tsunami affected the non-poor more, primarily as a function of household location. STAR data documents individual tsunami experience and differences in exposure to the tsunami by poverty status. Direct exposure to the tsunami largely depends on whether the household is located close to the coastline. As concluded above, households living close to the sea were on average wealthier hence direct tsunami experience was more common for the non-poor due to their location at the time of the tsunami. Looking within the most heavily affected areas, however, there is little difference between the poor and the non-poor in direct tsunami experience or in experiences in the immediate aftermath, including the receipt of aid.

Direct tsunami experience by poverty status

	Overall		Most heavily damaged areas	
	Poor	Non-Poor	Poor	Non-Poor
Mortality	6.8%	11.0%	19.3%	24.8%
Heard the water	28.5%	34.5%	63.8%	62.8%
Saw tsunami come ashore	19.1%	23.6%	47.5%	46.6%
See people search for loved ones	24.7%	28.5%	51.2%	54.9%

Source: STAR data and World Bank staff calculations

Tsunami-aftermath experience by poverty status

	Overall		Most heavily damaged areas	
	Poor	Non-Poor	Poor	Non-Poor
Living in temporary housing*	7.4%	8.4%	18.2%	18.3%
Reliant on aid-provided water*	5.9%	8.5%	21.8%	20.5%
Tsunami related aid from government	43.6%	44.0%	68.0%	65.4%
Tsunami related aid from NGOs	42.3%	40.6%	70.3%	67.6%

Source: STAR data and World Bank staff calculations. *at time of interview

10 <http://hrw.org/reports/2004/malaysia0404/3.htm>, accessed on 21 November 2007.



REDUCING POVERTY THROUGH GROWTH

3

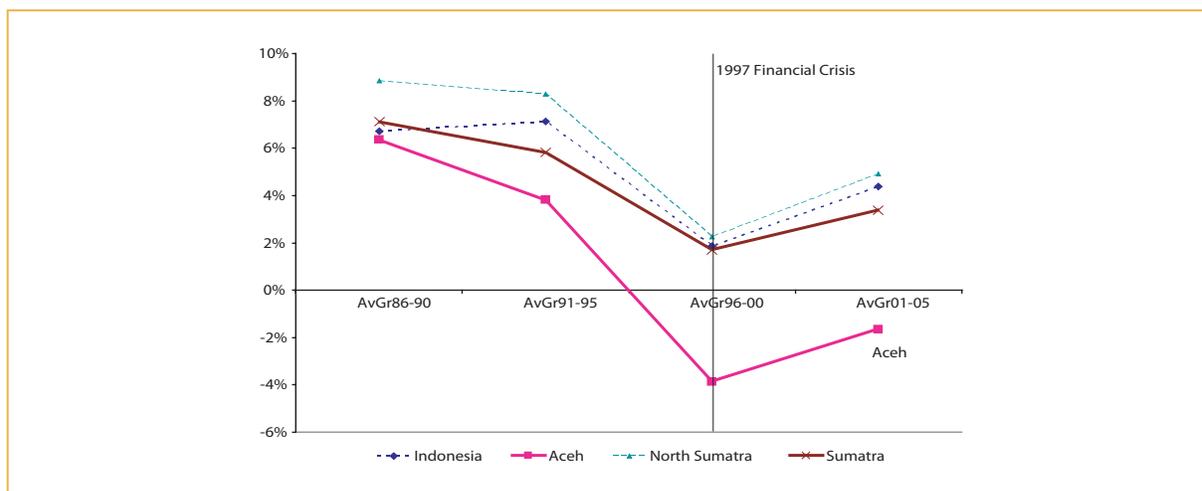
Key Findings

- Aceh has experienced low or negative growth rates for most of the past three decades. After 2001, while the rest of Indonesia started to recover from the 1997-98 financial crisis and grow, Aceh's economy continued to decline. The conflict and structural deficiencies are the main reasons for Aceh's weak growth performance.
- Aceh's economy is highly reliant on oil and gas. Capital-intensive sectors, such as oil and gas, tend to have a smaller impact on employment and poverty reduction. As a result, Aceh's poverty growth elasticity has been lower than in the rest of Indonesia.
- Aceh's economy grew at a modest 2 percent in 2006. The current growth pattern in Aceh is not sustainable: growth is primarily driven by sectors closely linked to the large reconstruction effort and funds, such as construction, transport and services, while the primary and secondary sectors continue to stagnate or decline. This growth pattern is reflected in the labor market, with employment being generated primarily in construction, transportation and services, while the primary and secondary sectors remain incapable of absorbing the increasing workforce.
- Agricultural revitalization remains vital for poverty alleviation efforts — almost 30 percent of Aceh's rural population lives below the poverty line and agriculture still offers employment to over 50 percent of the workforce. A key priority for the Government of Aceh in alleviating poverty should be to focus on growth and sustainable economic development in rural areas. The strategies for agricultural growth need to take into account the potential environmental risks associated with land conversion in the local context and should focus on intensifying production in areas already in agricultural use.
- The Government of Aceh should focus on enhancing the capabilities of the poor to increase productivity and engage in higher productivity activities, through skill development, and technology diffusion, as well as access to finance and rehabilitating physical assets damaged by the conflict or the tsunami. In addition, the Government of Aceh should also facilitate the linking of the rural poor to growth poles, by improving rural infrastructure and access to markets, as well as providing incentives for increased labor mobility between rural and urban areas.

In Indonesia, poverty reduction has been closely linked to economic growth for most of the past four decades. Economic growth has been identified as one of the key drivers of poverty reduction. Most countries that have reduced poverty significantly over prolonged periods of time did so while growing. The pace at which growth reduces poverty can differ widely, depending on initial inequality and the distributional pattern of growth (World Bank, 2000, 2007b). If growth benefits primarily the better off, poverty will be reduced at a slower pace. In Indonesia, growth has been markedly pro-poor. Timmer (2007) elaborates at length the main causes and policy choices that allowed Indonesia to benefit from pro-poor growth for such a long period of time. He identifies the close integration of rural and urban labor markets and increased agricultural productivity through investments in rural and agricultural infrastructure among the key factors for pro-poor growth in Indonesia. Both the pace as well as the pattern of growth will be important for poverty reduction efforts in Aceh.

Aceh has experienced low or negative growth rates for most of the past three decades, lagging behind Indonesia and North Sumatra in most years. Aceh was hit hard by the 1997–98 financial crisis, as was the rest of Indonesia, resulting in negative growth rates for four consecutive years. After 2001, while the rest of Indonesia recovered and started to grow, Aceh’s economy continued to decline (Figure 3.1). One reason for the lack of recovery was the prolonged conflict that robbed the region’s economy of its vitality. In the previous section we discussed how the conflict caused the displacement of half a million people, with many of the more skilled and better educated Acehnese leaving the province. There are also many structural reasons for Aceh’s weak performance, such as low investment levels, a relatively low human capital base, infrastructure bottlenecks due to both neglect and destruction during the conflict, as well as a lack of diversification within the economy. Continued low or negative growth for over two decades resulted in a poverty level twice the national rate by 2004.

Figure 3.1 Aceh’s economy continued to decline as Indonesia recovered from the financial crisis



Source: BPS and World Bank staff calculations.

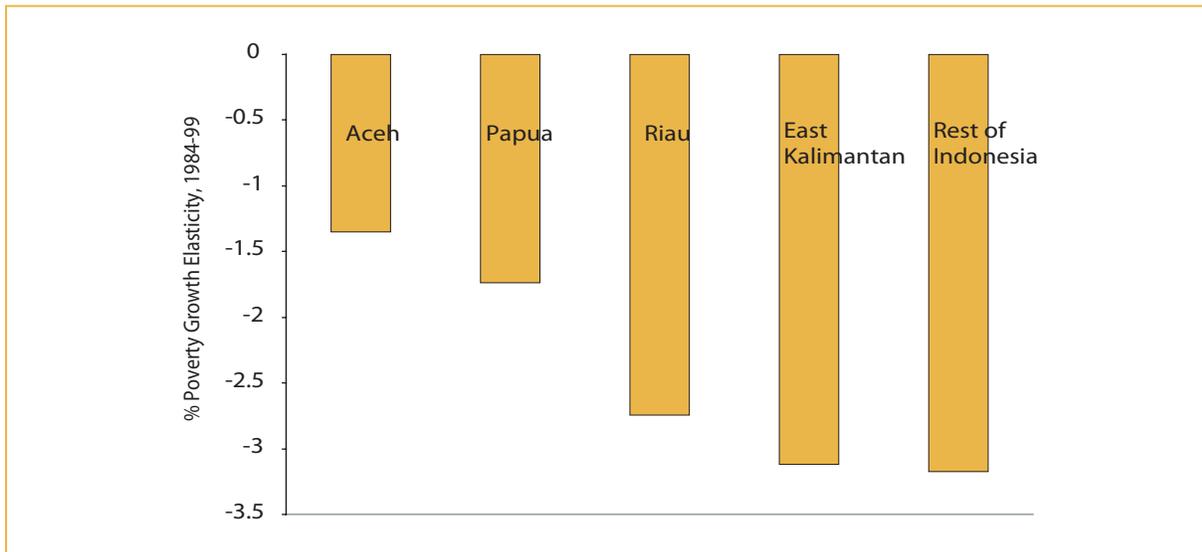
The structure of Aceh’s economy, together with the growth pattern, helps to explain the growing unemployment problem as well as the relatively disappointing performance of economic growth in reducing poverty. Sectoral growth patterns will determine the pace at which growth is able to alleviate poverty in Aceh. The impact of growth on poverty varies from sector to sector, with growth in labor-intensive sectors such as agriculture, construction or manufacturing having a large impact on poverty reduction, while more capital intensive sectors such as mining, utilities or services tend to have a smaller impact on poverty reduction.¹¹ The role of agriculture in alleviating poverty and development is highlighted in the latest World Development Report (World Bank, 2007e), which argues that 80 percent of the decline in rural poverty world wide, but particularly in Asia, is the result of improving conditions in rural areas rather than migration from rural towards urban areas. The report also argues that

¹¹ See Loayza and Raddatz, 2006, for more details on this topic.

growth originating in agriculture is twice as effective in alleviating poverty as growth originating in other sectors. Analysis of poverty dynamics in the previous section showed that crop diversification had a significant impact in the likelihood of escaping poverty in the aftermath of the tsunami. Similarly, owning a non-farm business was also a significant path to avoiding poverty, pointing at both the importance of agriculture and small and medium enterprises in escaping poverty. Conversely, growth in the gas sector in Aceh is unlikely to have a large impact on poverty or employment. Given the structure of Aceh's economy, it is safe to assume that poverty alleviation efforts should concentrate on promoting agriculture, as well as labor-intensive manufacturing activities related to agriculture.

The lower poverty reducing potential of resource intensive growth can be seen in Aceh's poverty-growth history extending back many years. Aceh has had a consistently lower poverty-growth elasticity in relation to other provinces in Indonesia over the 1984-99 period. Figure 3.2 conveys the percentage change in the poverty incidence in a particular province with a 1 percent change in overall provincial household consumption.¹² There is a strong relationship between overall growth and poverty reduction in much of Indonesia: an increase in mean consumption of 1 percent is associated with a 3.2 percent decline in poverty incidence. The estimates for Aceh and Papua (both provinces that are heavily reliant on extractive industries and have been affected by conflict) are significantly lower than for the rest of Indonesia. In Aceh, a 1 percent gain in mean consumption leads only to a 1.4 percent decline in poverty, less than half the associated decrease for the country as a whole. In Riau and East Kalimantan, provinces rich in natural resources but not affected by conflict, the poverty growth elasticity was not significantly different from the rest of the country.

Figure 3.2 Poverty growth elasticity in Aceh is one third of that in Indonesia



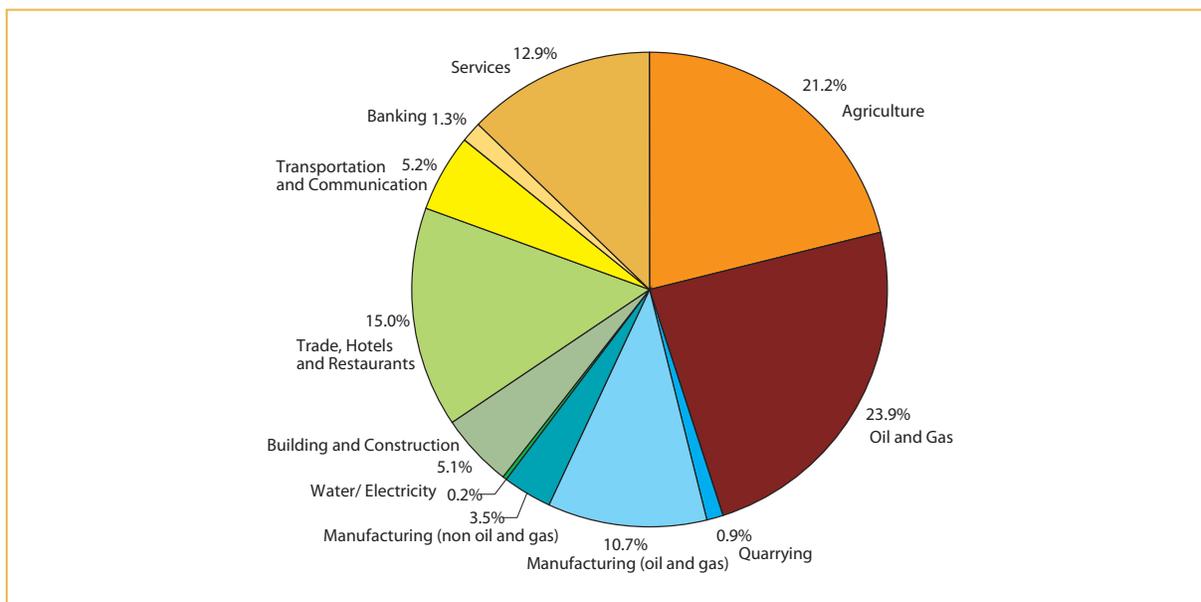
Source: BPS and World Bank staff calculations.

Aceh's economy relies heavily on mining (including oil and gas), which accounted for 24 percent of the GDP in 2006.¹³ Manufacturing, which contributed 14 percent to the GDP in 2006, is closely tied to the availability of cheap gas, with many manufacturing units closing as gas has become scarcer (Figure 3.3). While there were no significant shifts in Aceh's economic structure in the early years of the decade, in the past few years both mining and manufacturing have suffered contractions due to the depletion of known gas reserves. Conversely, the services sector has seen an expansion.

¹² See Friedman, 2005, and Ravallion, 2001, for an explanation of the methodology used for this estimation.

¹³ Preliminary figures from BPS.

Figure 3.3 Aceh's economy still relies heavily on oil and gas



Source: BPS, 2006.

Aceh's economy contracted by 10 percent in 2004 (before the tsunami) and by a further 10 percent in 2005 (Table 3.1). The contraction in the economy was the result of the declining mining and related manufacturing sector, and the impact of the tsunami in 2005, which further accelerated the decline of the manufacturing and agricultural sectors. The economy grew at a modest 2 percent in 2006, with the non-oil and gas economy growing by a healthier 7.7 percent, driven mostly by growth in the services sector related to the reconstruction effort, with mining and manufacturing continuing to decline. Without a recovery of the agricultural and manufacturing sectors, key for poverty reduction and employment creation, Aceh will face a structural downturn as the reconstruction effort winds down in 2009.

Table 3.1 Aceh's economic growth, 2003-06

Sectoral growth rates	2003	2004	2005	2006*
	%	%	%	%
Agriculture	3.3	6.0	-3.9	1.5
Oil and gas mining	9.9	-24.4	-23.0	-4.3
Mining and quarrying	3.6	7.3	0.8	78.8
Oil and gas industries	1.7	-11.6	-26.2	-10.5
Non-oil and gas industries	1.6	-37.3	-5.1	1.1
Electricity and water	17.0	19.5	-2.0	12.0
Building/ construction	0.9	0.9	-16.1	48.4
Trade, hotel and restaurants	2.5	-2.7	6.6	7.4
Transport and communications	3.9	3.7	14.4	11.0
Banking and other financial	31.0	19.4	-9.5	11.8
Services	6.3	20.1	9.7	4.4
Total (oil and gas)	5.5	-9.6	-10.1	2.4
Total (non-oil and gas)	3.7	1.8	1.2	7.7

Source: BPS.

Note: * Preliminary figures.

Benefits for the poor from economic growth for the poor will arise primarily through employment and increasing returns on investment. To escape poverty, the poor in Aceh should enhance their capabilities to increase productivity, particularly agricultural productivity, and engage in higher productive activities. Increases in agricultural productivity are likely to result in lower employment in the sector. However, a more productive agricultural sector will have beneficial backward and forward linkages in non-farm businesses in rural areas, absorbing part of the excess labor from agriculture. A more productive agricultural and fisheries sector will be more competitive and able to expand production (through exports and import substitution), increasing the demand for labor in these sectors. Having a non-farm business and being involved in diversified agricultural production have also been identified as factors that enhance the likelihood of escaping poverty. This finding is in line with those of the Indonesia 2006 Poverty Assessment, which found that improvements in agricultural productivity, as well as increases in non-agricultural productivity in both urban and rural areas (World Bank, 2006a), were key pathways out of poverty. As discussed in the earlier section, part of Indonesia's success in alleviating poverty stems from the relatively close integration of urban and rural markets, given that urban centers tend to be poles of growth. The poor should be able to link to growth poles, e.g. through an improved road network, access to markets and enhanced labor mobility. A poverty reduction strategy should, therefore, concentrate on improving the capabilities of the poor (skills, human capital, as well as their physical assets) and linking the poor to growth poles through rural infrastructure and increasing mobility from rural to urban areas. The Government of Aceh faces the challenge of an economy highly reliant on gas extraction, which has little impact on the poor. Current growth in the service sector is not sustainable given its reliance on the large inflow of reconstruction funds. Without a recovery of the agricultural and manufacturing sectors, it will be difficult for the Government of Aceh to make significant inroads in alleviating poverty. The box opposite illustrates some of the constraints that the poor in Aceh face to escape poverty.

Given the high numbers of rural people vulnerable to poverty in Aceh, growth in the agricultural sector will need to be pursued based on a sound understanding of the risks associated with land-use changes. Recent reports show that forests are being cleared in several districts of Aceh for both timber and conversion to agricultural use. In West Aceh annual land clearing has increased after the tsunami from about 300 ha during the conflict-intensive years (2002-05) to 4,400 ha — levels equal or higher than those before the intensification of the conflict (Budidarsono et al, 2007). Deforestation has the potential to result in increasingly frequent droughts and floods, leading to failure of irrigation systems and soil erosion, reducing agricultural productivity, seasonal drying of rivers, lowering groundwater levels and declining fisheries production particularly in aquaculture (Beukering et al, 2003). Increasingly, floods and landslides are being attributed to unsustainable logging practices: the impacts of three such events in Aceh between October 2005 and December 2006 led to the loss of dozens of lives, displacement of thousands of people and serious damage to infrastructure, housing and the productive sector (Blackett and Irianto, 2007). The December 2006 flood was estimated to have caused US\$37.2 million in damage to the agriculture sector across the seven districts it affected (World Bank, 2007f). With these risks, the different ways of increasing agricultural production have to be carefully evaluated. Instead of expansion of agricultural area further inland, a study in Aceh Singkil and South Aceh districts suggested intensification using irrigation systems and improving productivity of existing agricultural lands as the best options (PT Hatfield, 2007). This study, as well as Budidarsono et al, 2007 advocated the use of tree crops as a potential source of increasing rural livelihoods, while also contributing to protecting the environment.

Box 3.1 Linking growth and poverty reduction in Aceh

In Focus Group Discussions conducted for this report (Jamassy, 2007), people in rural areas expressed their views on key constraints to escape poverty. Many villagers cited conflict as the main reason for their poverty. During the conflict fear and distrust were prevalent and many could not tend to their farming, trade, fishing and other activities. Killings and physical and psychological injuries prevented many farmers from tending their fields and much of the agricultural work was neglected while the workers left the areas to avoid conflict and harvests were often neglected or stolen.

Asked about the constraints they are facing today, after the end of conflict, many farmers argued that *lack of access to credit* was the main obstacle to increasing their production. Although familiar with the banking system, few are able to access bank loans. They consider interest rates as too high, lack collateral and face arduous procedures in securing bank loans. There are a large number of donor-financed micro-finance programs, but amounts involved are small and without sufficient support, and the programs have fallen short of expectations, with funds often used to meet consumption needs rather than investment.

The *tsunami destroyed the physical assets* of many villagers. Although the outpouring of assistance means that there should be enough resources to at least replace pre-tsunami assets, the assistance has not always been forthcoming and quality issues remain.

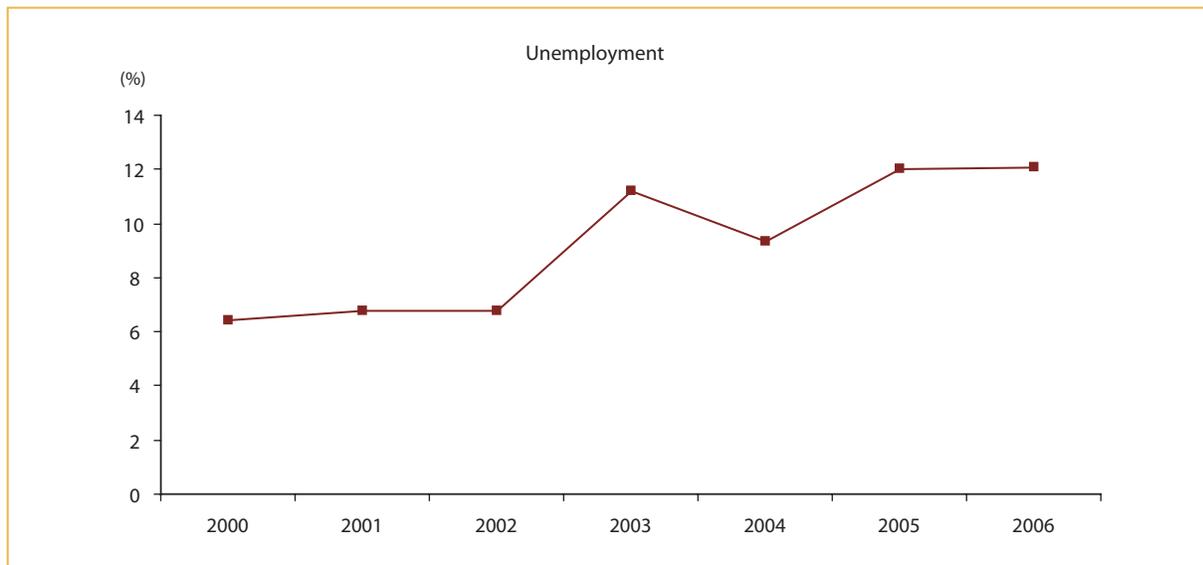
Marketing systems, controlled by middlemen, are not benefiting poorer farmers. Farmers are dependent upon middlemen for their marketing and purchase of inputs. The middlemen, who provide capital, will at harvest time eventually purchase crops at relatively low prices. Information asymmetries benefit the traders who are better able to appropriate rents. Farmers also complain that demand elasticity for their products is limited, so if there is an abundant harvest exceeding demand production will rot or prices drop, with no additional marketing channels open to them.

Farmers use *traditional farming methods*, with limited irrigation facilities. With only one harvest season per year and the ever increasing cost of fertilizer, many farmers find it very difficult to even meet their own meager needs. Farmers also complained about very little support from outside parties to increase their productivity via the use of better technologies.

Many villagers also *lack the necessary skills and human capital* to increase their productivity or diversity into more productive sectors. Low education levels translate into a lack of information regarding more advanced techniques or the processing of agricultural and fisheries products. Villagers felt that the following skills would increase their productivity: adopting improved fishing and agricultural technologies, simple fisheries and agricultural processing, maintenance of shipping equipment, pest control and management skills, seeding production and cultivation, and cottage industries such as sewing, mat weaving and baking.

Negative economic growth has contributed to persisting unemployment. The decline of Aceh's economy prior to, and in the immediate aftermath of, the tsunami has contributed to the growing unemployment problem in the province. Limited growth in some sectors (such as agriculture or some services sectors) has not translated into significant employment generation. Unemployment increased from about 6 percent in 2000 to 12 percent in 2006,¹⁴ despite the large reconstruction effort after the tsunami that has created significant job opportunities (Figure 3.4).

Figure 3.4 Unemployment has been increasing since the beginning of the decade



Source: BPS.

Unemployment in Aceh grew as a result of an increase in the workforce by 5 percent and a stark decline in agricultural employment. Excluding agriculture, total employment increased by 8 percent between 2003 and 2006 (Table 3.2). Agriculture remains the largest employer in Aceh, absorbing 56 percent of the workforce in 2006. There is a clear trend in employment away from agriculture and towards the service sector (including construction), more in line with the labor market in the rest of Indonesia, where currently about 45 percent of the workforce is in agriculture. Declining employment in agriculture despite relatively stable agricultural production suggests surplus labor or under-employment in the sector. This may be behind the much higher poverty levels found in rural areas. A more productive agricultural sector may therefore mean lower and not higher employment in agriculture. The current labor market structure in Aceh does not seem sustainable, with most employment generation in services (construction, transport) linked to the large inflow of reconstruction funds, while traditional sectors such as agriculture and manufacturing are unable to absorb the increasing workforce. When the reconstruction effort winds down in 2009 both the economy and labor market could face a downturn with an adverse impact on the well-being of the Acehnese.

¹⁴ There are two seemingly contradictory trends in Aceh's labor market, where both unemployment and nominal wages are increasing. This could be the result of (i) supply shortages for particular labor categories in high demand (such as semiskilled construction workers), (ii) lack of population mobility, creating labor shortages in some areas and (iii) wide availability of safety nets from NGOs and donors reducing incentives for many people to actively seek low-paying employment.

Table 3.2 Most post-tsunami employment creation in Aceh has been in the service sector*Percent*

Sector	2003	2004	2005	2006	Employment growth 05-06 (% change)
Agriculture	62.1	59.5	59.8	56.3	-6.1
Mining and quarrying (incl. oil and gas)	0.5	0.6	0.3	0.5	70.0
Industry	4.8	3.4	3.6	4.7	31.8
Electricity and water	0.1	0.6	0.2	0.3	40.6
Construction	2.9	4.1	3.8	4.8	28.2
Trade	14.8	15.2	14.4	14.0	-3.1
Transportation	4.0	3.9	5.2	4.5	-13.8
Finance	0.4	0.4	0.3	0.2	-31.6
Services	10.5	12.3	12.4	14.6	17.6
Total with agriculture ('000)	1,645.2	1,522.5	1,542.0	1,538.5	-0.2
Total w/o agriculture ('000)	624.3	616.5	619.6	672.2	8.5

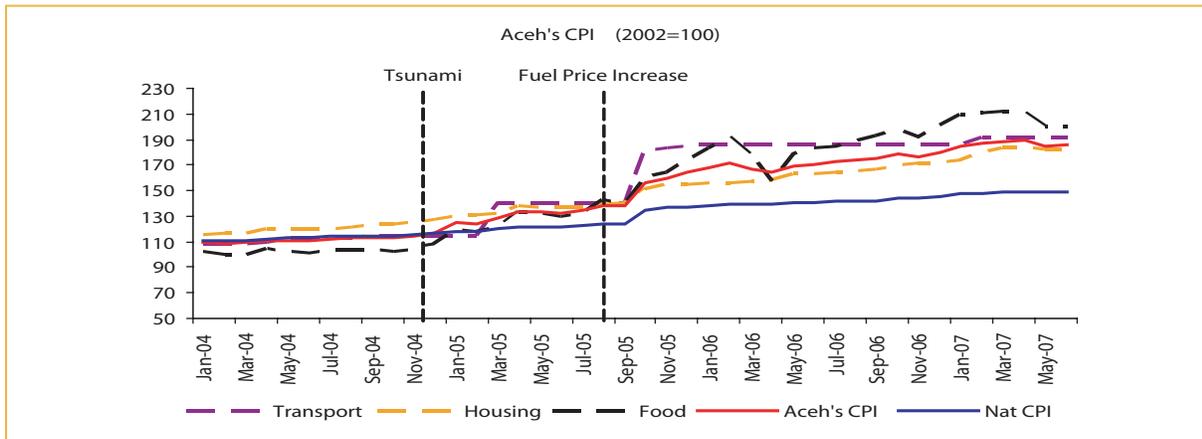
Source: BPS.

Real wages in Aceh have decreased significantly for a large share of the population. Inflation rose in Aceh steadily after the tsunami, reaching a peak of 41.5 percent year-on-year in December 2005, compared with 17.1 percent for the rest of Indonesia (Figure 3.5).¹⁵ By mid-2007, inflation was almost on par with national inflation levels, but the prolonged period of high inflation raises concerns regarding the competitiveness of Aceh's economy, as well as its impact on the purchasing power of the Acehnese. This high inflation was paralleled in nominal wage increases in sectors in high demand. An example of such a sector is construction, where wages have doubled in the past two years. Aceh's minimum regional wage¹⁶ (Upah Minimum Regional, or UMR) increased by 55 percent from Rp 550,000 pre-tsunami to Rp 850,000 in 2007, slightly below the increase in CPI. However, this is unlikely to be the case in other sectors where demand has not increased as dramatically and where the supply of labor is still large. Real wages in these sectors will not have kept up with high inflation levels and thus people working in these sectors will be worse off.

¹⁵ Inflation was exacerbated by the reduction in fuel subsidies in October 2005, which caused an inflationary surge across the entire country.

¹⁶ The UMR, set by the government in consultation with labor unions, parliament and the business community, is commonly used in the industrial sector to pay workers.

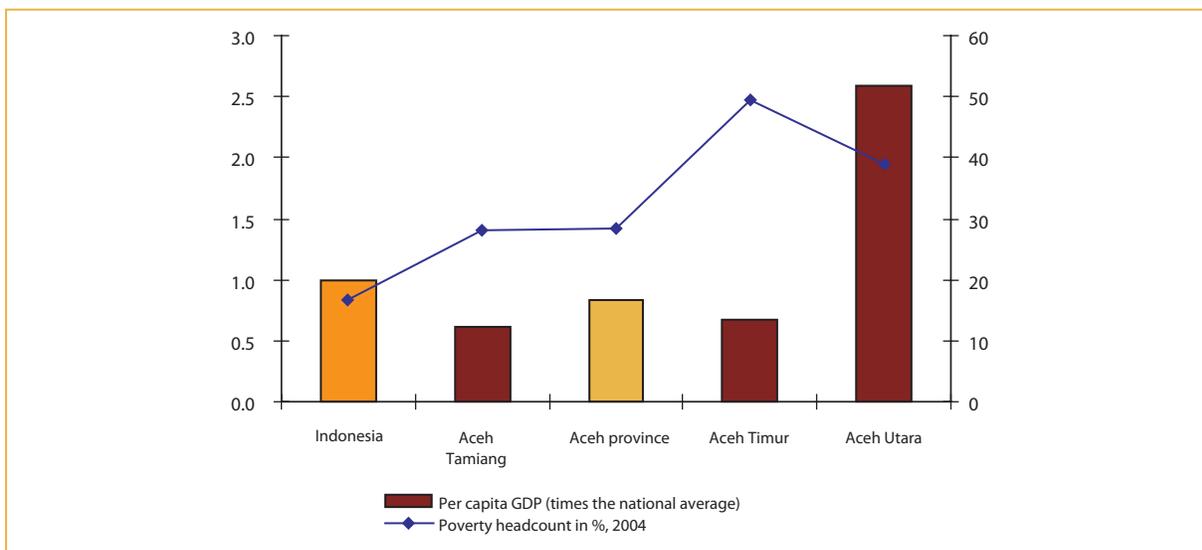
Figure 3.5 Prices of food and transport increased most in Aceh



Source: BPS.

Aceh will have a large amount of public resources to improve the capabilities of the poor, as well as facilitate the linking of rural areas to growth poles. The granting of special autonomy status to Aceh has meant that a large share of the revenue from gas extraction is being transferred back to the provincial government. With this wealth of resources, Aceh has the opportunity to reduce its high poverty levels and improve public services. However, abundance of natural resources does not necessarily translate into lower poverty levels and might be detrimental to competitiveness and governance (Mehlum, Moene and Torvik, 2006; Sachs and Warner, 2001). Within Aceh, districts with high revenues do not necessarily escape poverty. On the contrary, in gas-rich North Aceh nearly 35 percent of the population was living below the poverty line in 2004 (Figure 3.6).¹⁷ Large aid inflows are also often accompanied by so-called Dutch disease and compromise the economy's competitiveness (Nkusu, 2004). With both large aid flows and increasing transfers from the central government, Aceh's challenge does not seem to be availability of resources but how to avoid the double threat of the "natural resource curse", or Dutch disease, and how to use these funds efficiently to provide better public services and improve the competitiveness of the economy.

Figure 3.6 Per capita GDP and poverty in oil/gas producing districts, 2004



Source: BPS, World Bank staff calculations.

¹⁷ This is probably linked to the fact that North Aceh was one of the regions worst affected by the conflict.

The abundance of natural resources in Aceh may actually have caused the province to become poorer and not richer, since these resources lie at the heart of the province's conflict. Natural resources play a key role in triggering, prolonging and financing conflicts, plunging populations into distress and economic hardship (Ross, 2003). Before the exploitation of gas started in the late 1970s, Aceh had one of the lowest poverty rates in the country and better socio-economic indicators than most other provinces. By the end of the conflict, Aceh had one of the highest poverty levels in Indonesia. Countries that rely heavily on natural resources for their income and exports often grow more slowly increasing poverty incidence. Governance problems in such economies result in higher corruption and weaker and unaccountable governments. Resource abundance provides the economic incentives that make an independent state with absolute control over the resources more attractive, increasing the risks and hardship that populations are willing to take to achieve independence and gain control over resources. For example, in Aceh the secessionist movement became stronger just as PT Arun began operations in North Aceh in the 1970s. Natural resources, because of their specific location and high rents, are highly susceptible to exploitation or extortion, and this occurred in the case of PT Arun during the worst phase of the conflict after 1999. The exploitation of the gas coupled with the uneven distribution of wealth gave rise to the grievances that were then used by GAM to rally the population behind its separatist cause. Many good jobs bypassed the Acehnese population and a majority of the revenue from the gas was not transferred back to the province. The gas fields invited large contingents of both military and police to protect the facilities. The continued presence of these contingents became a further source of conflict with the Acehnese population (Ross, 2005).

The conflict disrupted the provision of public services. By 2001, as many as 80 percent of Aceh's villages were under GAM's control. Across most of the province the Indonesian government had ceased to function and many local politicians and civil servants were either co-opted by GAM or killed. Education suffered particularly, with about 900 schools destroyed during the worst period of conflict from 1999 onwards (World Bank, 2006b). The conflict has affected a whole generation, and a large number of the new recruits to GAM during the worse phase of the conflict (1999 onwards) were children who had lost their parents to the Indonesian military and police. Many people could not tend to their land and many were forced into refugee camps or migrated, abandoning land and properties (Barron et al, 2005). The conflict affected the business environment in the province, with both the military and GAM demanding 'taxes' from large and small businesses, as well as communities (Schulze, 2004; Sukma, 2004). The attacks on the gas fields and processing facilities intensified and PT Arun had to close down its LNG facility in 2001 for five months because of lack of security. Two years after the signing of the MoU that ended the 30-year conflict concern over a resurgence of conflict is one of the key constraints to long-term investment in the province. Infrastructure also suffered greatly during the conflict. Between 11 percent and 20 percent of all transport infrastructure was directly damaged by the conflict, depending on type of infrastructure (World Bank/ Kecamatan Development Program, 2007). Similar damage was recorded in other infrastructure (water, electricity) and an even larger share of infrastructure was severely damaged due to lack of maintenance, closely related to the existence of the conflict.

Aceh continues to be a province rich in natural resources, both a source of opportunities and of concern for the future development of the province. Resource wealth raises the danger of conflict, but it is avoidable. Better policies may help to reduce the likelihood that resources will generate conflict, redirecting resources to education, health and poverty reduction. The Government of Aceh could reduce the negative impact of natural resources on growth by diversifying the economy, particularly through promoting exports. It could also reduce the negative impact of resource wealth on governance by increasing transparency on the revenue by highlighting the resources that the gas fields contribute to Indonesia as a whole and Aceh in particular, and internally on the use of these resources. Strong enforcement of the law is also necessary, since the incentives for exploiting natural resources illegally (whether gas or timber) are also large. The Government of Aceh should strengthen its capacity to enforce the law and restrict illegal activities that may create vested interests in a continuing conflict environment.



USING LARGE FISCAL RESOURCES TO COMBAT POVERTY

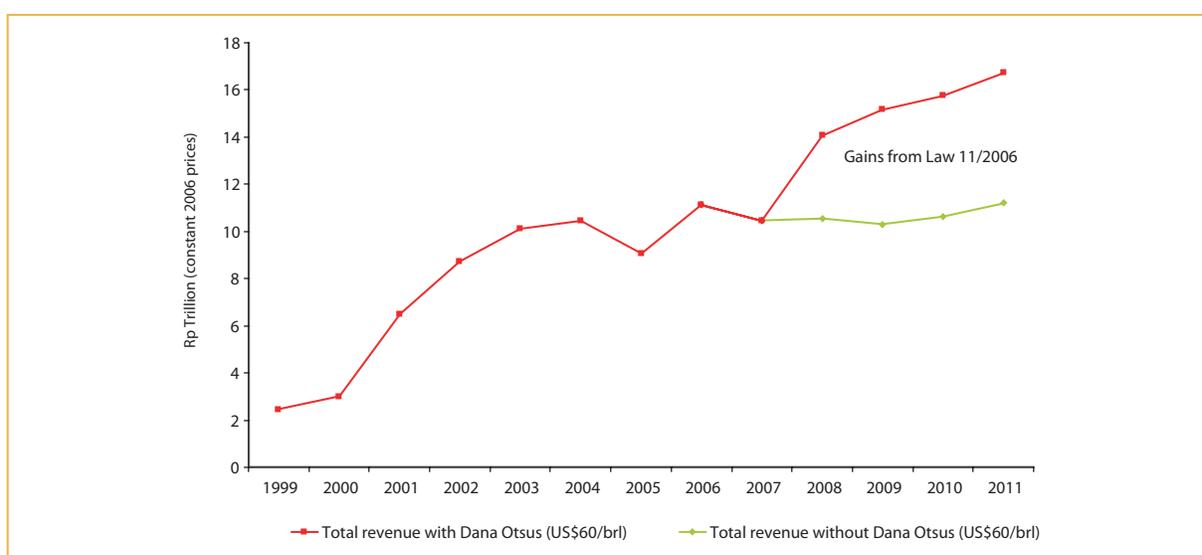
4

Key Findings

- Aceh currently benefits from fiscal space to significantly improve the delivery of public services, as well as undertake the necessary investments to enhance the competitiveness of Aceh's economy. Fiscal space is expected to increase as the Law on Governing Aceh (Law No. 11/2006) foresees the allocation of additional resources, adding up to a third to current transfers.
- In addition to these large resources, Aceh and Nias are home to the largest reconstruction project in the world following the 2004 tsunami. Pledges to the reconstruction are estimated at US\$7.5 billion to be spent over a five-year period (2005-09).
- The distribution of revenue among district governments in Aceh does not seem to be driven by poverty considerations. The allocation of funds over which the Government of Aceh has authority (particularly the Special Autonomy Fund) could be used to correct some of the existing imbalances and benefit those district governments with the highest poverty levels.
- The provincial and district governments in Aceh are now responsible for the majority of spending in a number of areas, such as health and education. As in the rest of Indonesia, the decentralization of responsibilities and funds was not necessarily accompanied by the transfer of human resources to the provincial and district governments. The Government of Aceh could use funds and its Special Autonomy Status to improve the quality of its staff and administration.
- Large revenue transfers do not necessarily translate into lower poverty levels, unless the funds are well spent. An increasing civil service wage bill, particularly in key sectors such as education and health, is leaving few funds available to invest in improving public service delivery and infrastructure. The concentration of development expenditures on government administration is cause for concern. The Government of Aceh can improve public spending by guiding the allocation of funds towards more efficient spending and using the allocation of funds over which it has authority to reward efficient spending by local governments.

Aceh currently benefits from ‘fiscal space’ to significantly improve the delivery of public services, as well as undertake the necessary investments (e.g. in infrastructure, agriculture) to improve the well-being of the Acehnese.¹⁸ Since 1999, Aceh’s regular revenues managed by the province and local governments increased several fold. Several factors contributed to this increase, including the transfer of responsibilities in 2001 following decentralization and Aceh’s special autonomy status in 2002. Beginning in 2008, the new Law on Governing Aceh (Law No.11/2006), known as LOGA, will allocate an additional Rp 3.5 trillion through a Special Autonomy Fund (Dana Otsus) (Figure 4.1). The law gives Aceh an additional 2 percent from the General Allocation Fund (Dana Alokasi Umum or DAU) for 15 years, beginning in 2008. In 2023, the allocation will be reduced to 1 percent of DAU for a further five years. In addition, following the December 2004 tsunami, Aceh received an unprecedented amount of assistance from the Indonesian government and the international community. Pledges to the reconstruction effort are estimated at about US\$7.5 billion over a period of five years (2005-09).

Figure 4.1 Large resource allocation should translate into poverty reduction



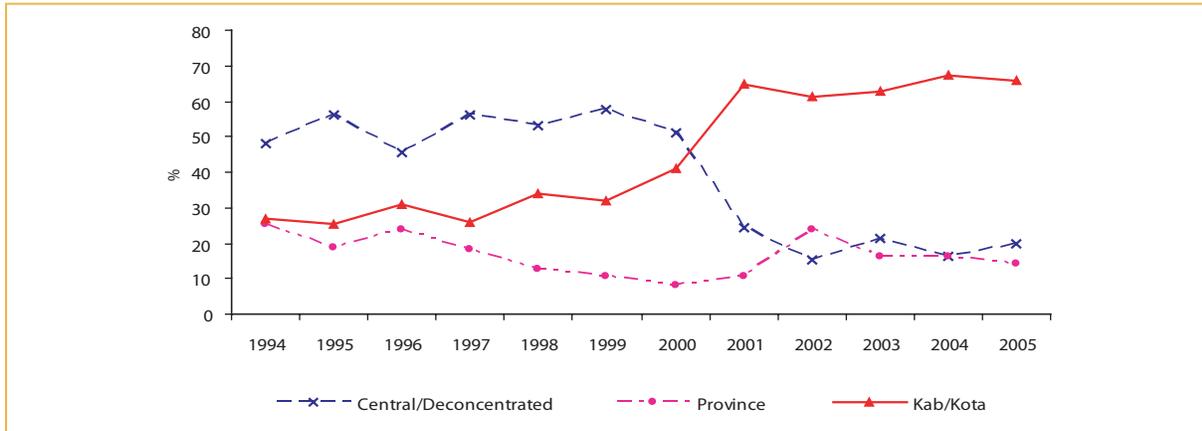
Source: World Bank, 2006b.

The fiscal space available for public investments and enhanced public services delivery is expected to continue growing if local governments are willing and able to rein in some major expenditure items, primarily personnel expenditure. Several reports (World Bank, 2006b and 2007d) analyze public expenditure and public services provision in Indonesia and Aceh. This chapter draws extensively on those reports, analyzing how public expenditure in Aceh can be used to combat poverty.

Regional governments in Aceh manage more than two thirds of the total public spending (Figure 4.2). Before decentralization, almost 60 percent of the spending was carried out by the central government, leaving a limited role for regional governments. The decentralization trend continues unabated and 2006 saw a large increase in transfers of resources (primarily DAU) to provincial and district governments. Given this new reality of decentralized spending and responsibilities, the well-being of the Acehnese is now largely in the hands of local governments. The decentralization of resources and responsibilities in Indonesia was not accompanied by a transfer of skills to manage those resources and functions are not always clearly divided between the different government levels. A recent public financial management survey conducted in all districts in Aceh showed a relatively poor performance of most district governments in public financial management, partially explained by the lack of skilled personnel in key positions (World Bank, 2007c).

¹⁸ ‘Fiscal space’ refers to the ability of the Government of Aceh to undertake discretionary expenditures without impairing its solvency. See World Bank, 2007d, for further explanation on the concept of ‘fiscal space’.

Figure 4.2 Districts have increased their share of public spending to almost 70 percent

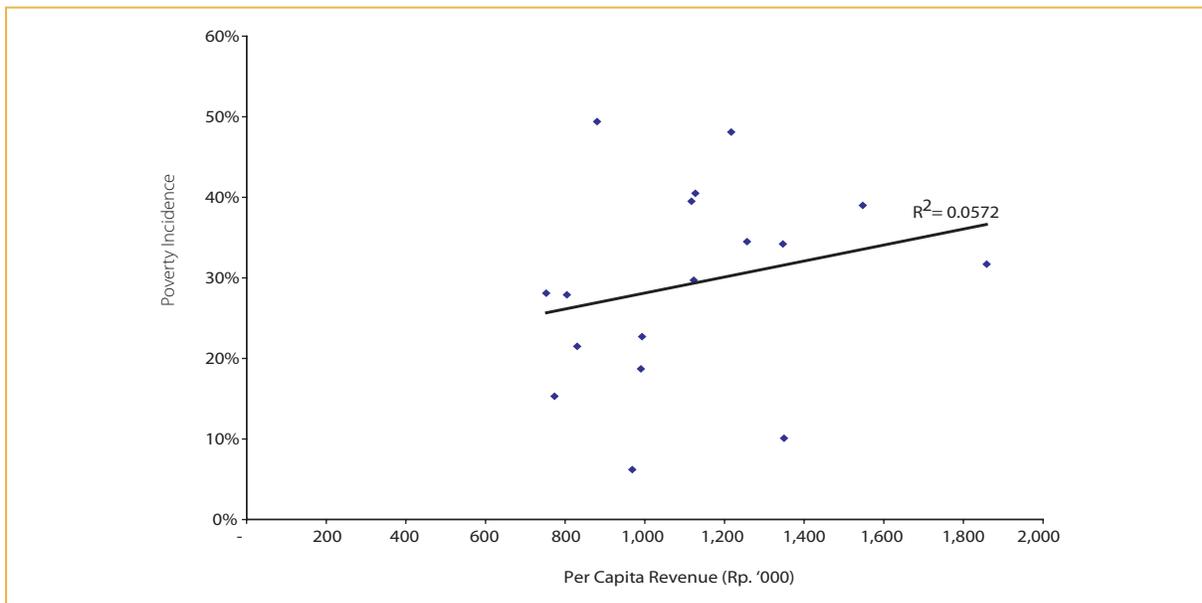


Source: World Bank, 2006b.

There seems to be little relationship between poverty levels and the allocation of public resources in Aceh.

The bulk of Aceh’s revenues comprise the DAU and natural resources revenue sharing (Tables 5A and 6A in the annex). There is no significant relationship between the poverty level in a district and revenue transfers as the scatter plot below shows (Figure 4.3), and some of the poorest districts receive some of the lowest per capita revenues. Inequality in resource allocation is partly the result of uneven allocation of revenues from oil and gas to producing and non-producing regions. The DAU allocation, which could be used to reduce inequalities arising from revenue-sharing, does not address the imbalances in revenues across districts. Significant disparities in per capita revenue among local governments in Aceh is reflected in per capita allocation of resources in key sectors, such as education, health and infrastructure and the corresponding provision of public services (Figures 1A and 2A in the annex). The Government of Aceh could use the distribution of the Special Autonomy Fund to close some of the existing imbalances among local governments and reward efficient spending by local governments.

Figure 4.3 Per capita revenue and poverty levels, 2004



Source: World Bank staff estimates based on data from SIKD/MoF, BPS.
Note: Data were available for 18 of 21 local governments, Kota Sabang excluded.

Current expenditure patterns are not geared to poverty alleviation. Since decentralization, spending on personnel has crowded out capital investment in public services (World Bank 2006b). In addition, development expenditures are concentrated on government administration, the share of which in total development expenditure increased from 12 percent in 1999 to almost 40 percent by 2004. This was detrimental to other areas with a more direct impact on the provision of public services, such as health, education or infrastructure spending (Table 7A in the annex for details on spending).

Reconstruction spending in Aceh and Nias will amount to US\$7.5 billion over a five-year period. The tsunami hit Aceh after a 30-year conflict that had already severely damaged the provision of public services and infrastructure in conflict areas (World Bank/Kecamatan Development Program, 2007). The response of the Government of Indonesia and the international community to the tsunami was very generous, with assistance pledges exceeding estimated needs. The Government of Aceh should make use of this large pool of funds and expertise to improve the provision of public services and make investments to improve infrastructure. But as the next box illustrates, not all assistance has been well targeted or efficiently distributed.

Box 4.1 Aid distribution after the tsunami

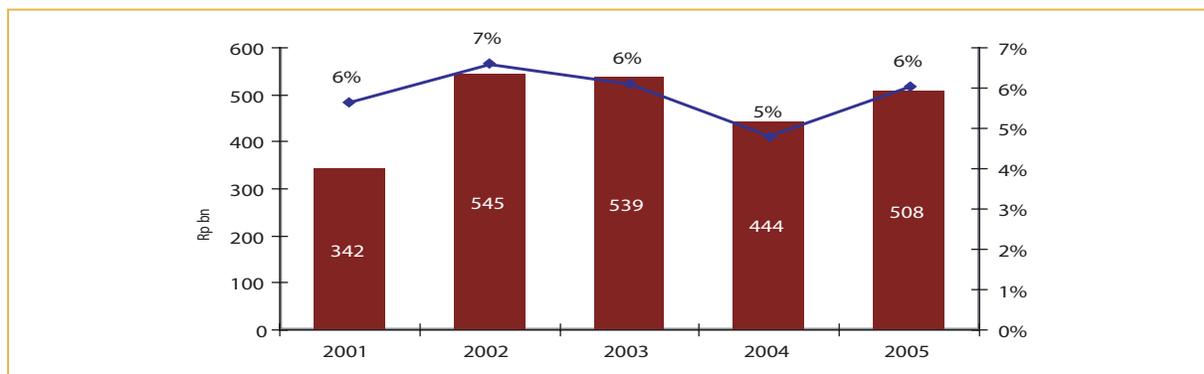
The STAR survey suggests that aid in the aftermath of the tsunami was helpful for households to escape poverty. Households receiving government aid were 42 percent more likely to escape poverty than those that did not receive any government aid. But it also suggests that the poor and the non-poor benefited equally from government assistance. STAR shows a very similar percentage of poor and non-poor households receiving assistance from both the government (43.7 percent vs. 44 percent) and NGOs (42.3 percent vs. 40.5 percent). Limited information on households' income and the urgency to distribute aid may have prevented targeting assistance. In addition, to a large extent agencies were not targeting the poor in Aceh but those affected by the tsunami, regardless of whether they were poor or not at the time of the tsunami. The literature on the subject of targeting aid (Cornia and Stewart, 1983) identifies two types of errors in targeting interventions, one in which unintended individuals benefit from the aid and another one in which aid does not reach its intended beneficiaries. Targeting aid is a difficult undertaking in any circumstances, but the scale of the disaster and destruction, as well as the urgency of the relief effort made targeting assistance in Aceh even more difficult.

Regarding the efficiency of distribution, several reports highlight the need to involve communities and village authorities in the distribution of aid to ensure a fair distribution that reaches those most in need (ODI, 2005) and the need to include conflict-awareness in the distribution of aid to avoid unintended consequences, such as raising tensions between receiving and non-receiving communities or fueling extortion of aid recipients by the military or GAM (Burke and Afnan, 2005). In Aceh, aid often generates conflict between beneficiaries, non-beneficiaries and implementing agencies, as documented in the Aceh Conflict Monitoring Updates of the World Bank (www.conflictanddevelopment.org). Around 20 aid-related incidents were reported in September 2007, somewhat lower than in previous months. Lateness and quality of aid, charges of corruption and mismanagement, and land ownership issues, as well as discussions on beneficiaries, have all been cited as causes of conflict, mostly, but not always, non-violent.

Recommendations regarding the need to involve communities in aid distribution, as well as increasing conflict awareness of all players were echoed in focus group discussions undertaken for this report (Jamassy, 2007), that looked specifically at the issue of aid distribution and its impact on poverty. The discussions highlighted the lack of coordination in aid distribution among agencies, both in the emergency phase and later in the reconstruction phase. This lack of coordination led to inequalities in the amount of aid that victims received, and the fact that many non-victims also receiving aid. A lack of communication with communities meant that some of the aid provided was not appropriate, such as fishing equipment that did not conform to existing sea conditions or seedlings that were not compatible with the climate. Coordinating aid distribution with village administration is key in ensuring a fair distribution that reaches the intended beneficiaries.

Local government spending on health has barely increased since 2002 despite increasing total revenues (Figure 4.4). Health expenditure in Aceh as a share of total spending is among the lowest in Indonesia at less than 6 percent. This low allocation share nonetheless translates into relatively large per capita health spending as a result of Aceh's large level of spending. About 86 percent of all public health spending is undertaken by the provincial and district governments, a result of the decentralization of both resources and responsibilities. Although the number of healthcare providers in Aceh is above Indonesia's average and there are already a large number of healthcare facilities, the share of health expenditure spent on salaries and the building of new facilities continues to rise. This is to the detriment of allocating funds to the operation and maintenance of health facilities, which has been identified as a major constraint for the delivery of services. This mismatch between needs identified and spending patterns means that relatively high per capita health spending compared with the rest of Indonesia has failed to result in any significant improvements in health outcomes.

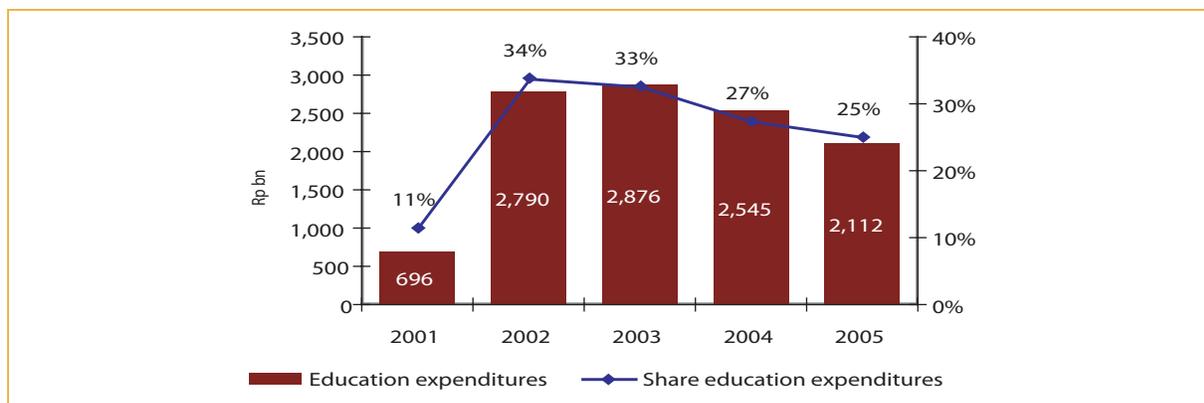
Figure 4.4 Health expenditures as a share of total expenditure



Source: World Bank staff estimates based on MoF data (constant 2006 prices).

Regional education expenditures quadrupled after decentralization but have decreased since then (Figure 4.5). Aceh has the second highest per capita education expenditure in Indonesia, at Rp 457,000, more than twice the national average of Rp 198,000. Currently, the provincial and district governments provide the bulk of the spending for education (63 percent). Funding for education is guaranteed by the LOGA, which stipulates that a minimum of 30 percent of additional revenue-sharing be allocated to education expenses. However, the spending pattern is preventing Aceh from reaping the benefits of such large expenditures (the next chapter elaborates further on education spending patterns).

Figure 4.5 Education expenditures as a share of total expenditure



Source: World Bank staff estimates based on MoF data (constant 2006 prices).



USING PUBLIC SERVICES TO ALLEVIATE POVERTY

5

Key Findings

- Aceh has higher enrolment levels than the average in Indonesia. This holds true both across income levels and all types of education. This could be the result of a high share of spending on education, as well as significantly higher per capita education spending in Aceh.
- After practically achieving universal primary education in Aceh, the Government of Aceh should now be concerned with improving the quality of education, as well as enhancing access to higher levels of education, particularly for the poorer segments of the population.
- Improving the allocative and technical efficiency of education spending should be high on the Government of Aceh's priority list. There are large numbers of teachers in the province, but teacher absenteeism and shortages in rural and remote areas may be compromising the quality of teaching. A different set of incentives for both schools and teachers may allow Aceh to benefit more from the relatively large per capita education expenditure.
- As a share of total spending, Aceh spends less than the rest of Indonesia on healthcare but, given its large budget, per capita spending is higher. However, many health indicators (morbidity, immunization) in Aceh are worse than in the rest of Indonesia.
- A large percentage of those from poor households in Aceh do not seek any treatment when ill, which may help explain the relatively poor health indicators in the province. The large public spending on health does not seem to be reaching all of the poor.
- There is room for improving health spending in the province. The workforce is unevenly distributed, creating gaps in rural and remote areas. Appropriate incentives should be given to health workers to work and live in rural and remote areas. Public spending should be used to improve the quality of the services that the poor primarily use, such as primary health and Puskesmas services.

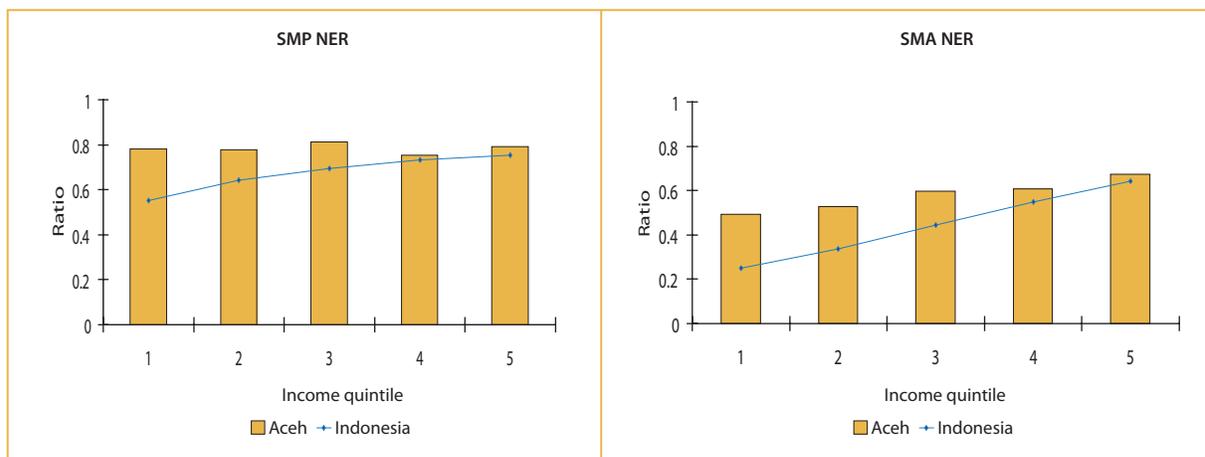
Access to health and education are two key dimensions of poverty. As mentioned in Chapter 2, poverty is multi-dimensional in nature and, although this report focuses on household consumption as a poverty measure, other measures of well-being are as important, such as access to health and education services. Education is crucial to improving literacy rates and equipping the poor with the means to contribute to, and benefit from, economic growth. Education is correlated with poverty in Aceh and households whose head has secondary or tertiary education are significantly less likely to be poor than those with only primary or no education at all. LOGA acknowledges the importance of education by institutionalizing a relatively high allocation of public resources to education. Health is another key dimension of poverty and lack of access to healthcare has a long-standing correlation with poverty. The Government of Aceh has made attempts to provide universal and free primary healthcare.

Improving infrastructure, particularly rural infrastructure, as well as public services to increase productivity in agriculture and fisheries, are key for poverty alleviation. The current section focuses on the provision of public services in education and health. However, the provision of public services in other areas, such as infrastructure, agricultural extension services or the sustainable use of natural resources, is at least as important for poverty alleviation, as documented throughout this report. The availability of information and scope of the report prevent an in-depth analysis of public spending and public services provision in other sectors. Further research will be needed to analyze spending patterns as well as the delivery of public services in these other key areas.

Education

Aceh has a higher enrolment level than Indonesia or North Sumatra. This holds true across income levels and all types of education (Table 8A in the annex). In Aceh all income groups have higher enrolment levels than their peers in Indonesia and North Sumatra, and this difference is more pronounced in the poorer sections of the population (Figure 5.1). Higher enrolment levels in Aceh are not new. There is evidence that the Acehnese have had consistently higher enrolment levels than the average Indonesian household since before independence, with a higher likelihood of finishing primary, junior or senior high school (Figure 3A in the annex).

Figure 5.1 Comparison of enrolment rates in Aceh and Indonesia



Source: Susenas, 2006, and World Bank staff calculations.

The tsunami, in addition to damaging or destroying a high percentage of education facilities, temporarily impacted enrolment levels. STAR reports a decline in primary and junior high school access of 68 percent in the most heavily tsunami-affected communities. The same survey also finds an increase of students per school, which supports the hypothesis that a shift of students from damaged to functioning schools occurred. Susenas also reports a temporary decline in enrolment from 2004 to 2005 across income groups and education levels (Table 9A in the annex). Fortunately, 2006 enrolment rates are closer to pre-tsunami levels, signaling a relatively short-lived impact.

The high enrolment levels in Aceh are partly the result of relatively high education spending. Regional government spending on education was 31.8 percent of total expenditure in 2004, whilst average regional government spending on education in Indonesia was 28.8 percent. This higher share of government spending on education translates into a relatively high development spending as a share of education spending, 32.9 percent in Aceh vs. 16.6 percent in Indonesia. This large share of spending on education is likely to continue, because LOGA requires that a minimum of 30 percent of additional revenue be allocated to education, guaranteeing stable allocation of revenues to the sector.

Inequality in accessing education remains a problem in Aceh, particularly at higher education levels, although this is less of a problem than in the rest of Indonesia. Comparison of enrolment levels in Aceh and Indonesia across income quintiles shows that higher average enrolment levels in Aceh are mainly the result of relatively high enrolments of the lower income groups, while enrolment of the richer segments of the population is very similar in Aceh and the rest of Indonesia. Adverse socio-economic characteristics such as low income and youth employment negatively impact enrolment. Indonesia-specific analysis shows a significant negative relationship between poverty, youth employment and education outcomes (World Bank, 2007a). Adequate access to schools is not enough to reduce the burden of education costs that limit enrolment. Compensation policies for foregone earnings or out-of-pocket spending on education would increase access to education.

Analysis of out-of-pocket expenditure by income level suggests that high spending levels are also benefiting the better off. Per household out-of-pocket expenditure of the lowest income group is somewhat larger in Aceh than in the rest of Indonesia. This is reversed at the second lowest quintile, with Indonesian households spending slightly more on education than in Aceh, and the difference becomes larger (both in absolute and relative terms) at higher income levels (Table 5.1). Average household education expenditure in Aceh is lower, showing the positive impact of public spending on household out-of-pocket spending, but it appears that a disproportionate share of spending benefits the richer segments of the population compared with the rest of Indonesia.

Table 5.1 Per capita education expenditure in Aceh, 2006

Income quintile	Aceh		Indonesia	
	Monthly per capita education exp. in Rp	Share of total per capita expenditure (%)	Monthly per capita education exp. in Rp	Share of total per capita expenditure (%)
1	3,601	2.6	3,264	2.4
2	4,719	2.5	4,782	2.5
3	6,058	2.6	6,693	2.8
4	7,926	2.6	10,289	3.2
5	14,369	2.5	28,211	4.4
Average	7,335	2.6	10,648	3.1

Source: Susenas, 2006 and World Bank staff calculations.

The focus of the government should be on improving the quality of education and increasing higher education enrolment levels, given almost universal primary education enrolment levels in Aceh. This is consistent with the rest of Indonesia, where high primary education enrolment levels calls for a focusing of resources toward improving education and expanding access to higher levels of education (World Bank, 2007a). Standardized tests such as PISA (Program for International Student Assessment) 2002 and 2003, which compares the performance of students across countries, show that Indonesian students scored lowest of all participating countries, although it is also worth mentioning that Indonesia was the only low middle-income country participating, the rest being developed or high middle-income countries. Cross province results on national exams indicate that Aceh has a similar performance to the rest of the country. The percentage of students passing the final grade of primary and senior high school is comparable to the rest of Indonesia, although passing rates of junior high school are lower (Table 5.2). The combination of gross enrolment data and passing rates suggests that an increasing number of

students are not finishing the final grade. Quality of teaching is compromised among other reasons by teacher absenteeism.¹⁹ Teacher absenteeism is more of a problem in rural and remote areas, given that teachers favor urban areas, creating unmet needs in rural areas (World Bank, 2006b).

Table 5.2 Graduation rates, 2004/05

Percent

	Primary school (SD)	Junior high school (SMP)	Senior high school (SMA)
Aceh	96.6	89.5	91.5
North Sumatra	97.6	93.4	87.7
Indonesia	96.8	98.0	92.1

Source: MoNE, 2005.

The size of the workforce in the education sector and its uneven distribution across the province is a key source of inefficiency in education spending in Aceh. Teacher salaries, which account for 93 percent of all routine spending on education, increase the financial burden on total education expenditures, leaving fewer resources available for improving the education system. Aceh the student-to-teacher ratios (STR) are already 20:1 for public and private elementary schools and 18:1 for public and private junior high schools, significantly lower than the national policy which sets them at 40:1 for primary and 28:1 for junior secondary (World Bank, 2006c).²⁰ International experience finds a ratio of 30:1 optimal and levels below this may have very low marginal returns. Although there are enough teachers in the region, a rural-urban imbalance in teacher numbers creates unnecessary personnel gaps in rural and remote areas. Furthermore, a majority of teachers still do not have the legally mandated qualifications and spending on the operation and maintenance of schools is inadequate.

The high salary bill should be used efficiently to improve the quality of teachers and teaching. Providing funds to schools on a per pupil basis and allowing the schools to hire the number of teachers they believe are required may improve teacher allocation. This would also erase the incentive for schools and districts to request more teachers who would then be paid through a higher DAU allocation. It would also partially address issues of teacher absenteeism and the hiring of part-time teachers, because schools would have the incentive to use their resources more efficiently. In the short term, improving the geographical distribution of teachers may be an easier option.

Health

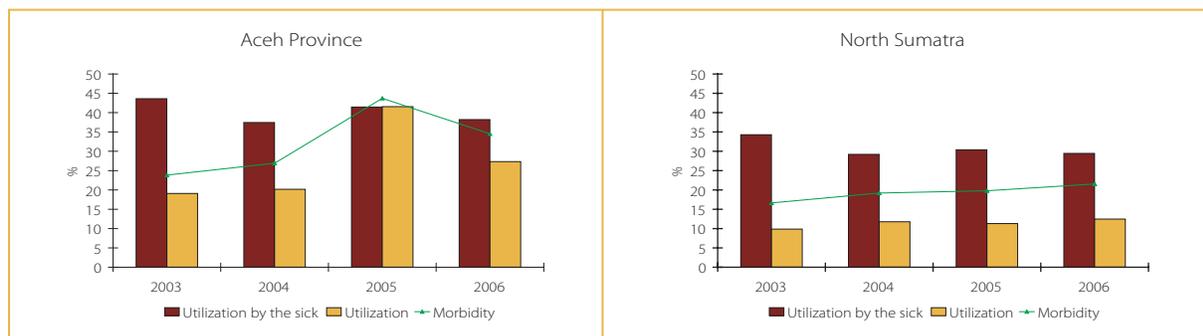
The morbidity rate in Aceh pre-tsunami, at 27 percent of the population, was higher than in North Sumatra (19 percent), but comparable to the rest of Indonesia.²¹ The long conflict, during which access to health services was reduced, is likely to have been a contributing factor to the high morbidity levels in Aceh. Analysis at the *kecamatan* level supports this. Children and adults living in conflict-affected areas are significantly more likely to experience illness than those areas less affected by the conflict (Figure 4A in the annex). After the tsunami, reported morbidity increased by 17 percentage points in Aceh, reflecting the physical and psycho-social trauma of the tsunami and subsequent displacement. Reported morbidity decreased in 2006 but continues to be relatively high (Figure 5.2). Increased morbidity was met with higher utilization of health services. Utilization rates of people who reported to be sick, as well as non-sick (i.e. those seeking preventative care), increased by 4 and 21 percentage points, respectively, in 2005. The impact of the tsunami on health outcomes was strong but may have been short lived, since there was already a significant decline in morbidity by 2006.

19 Results of the Governance and Decentralization Survey (GDS). At 96 of the schools surveyed in Aceh there were 29 schools where teachers were not present during their working hours. See Annex B1 for details of this survey.

20 However, when analyzing student teacher ratios one also has to take into account the high teacher absenteeism and the fact that many teachers only work part-time.

21 The term morbidity rate refers to the incidence rate of a disease.

Figure 5.2 Trends of reported morbidity and healthcare utilization



Source: Susenas various years and World Bank staff calculations.

Utilization of healthcare services in Aceh is relatively high but a large share of the sick does not seek formal healthcare. Pre-tsunami total utilization of health services was 20 percent, relatively high compared with about 10 percent in North Sumatra. In Aceh, there is a relatively large utilization of services by people with no symptoms, signaling a demand for preventive care (Table 10A in the annex).

High per capita public spending on health contributed to the high utilization rates in Aceh. The share of public spending on health in Aceh, at less than 6 percent, is lower than in other regions in Indonesia, at 7 percent on average, but per capita spending remains above average (Rp 78,000 in Aceh vs. Rp 51,000 in Indonesia in 2004). As a result of the high per capita spending, Aceh's health workforce is relatively large compared with other provinces, at around 11 midwives per 10,000 people, compared with an average of 5 midwives per 10,000 for Indonesia and two doctors per 10,000 people, the same as the national average. The share of development health spending of sub-national governments has decreased in both absolute and relative terms, with salaries of personnel accounting for 54 percent of total health expenditure, or 83 percent of all routine expenditure, in 2004.

Table 5.3 Out-of-pocket health expenditure

Income quintile	Aceh		Indonesia	
	Per capita (Rp)	Share of total (%)	Per capita (Rp)	Share of total (%)
1	2,186	1.6	3,022	2.3
2	3,464	1.9	4,571	2.5
3	4,051	1.7	6,161	2.6
4	6,860	2.2	9,261	3.0
5	13,995	2.4	21,550	3.7
Average	6,111	2.0	8,913	2.8

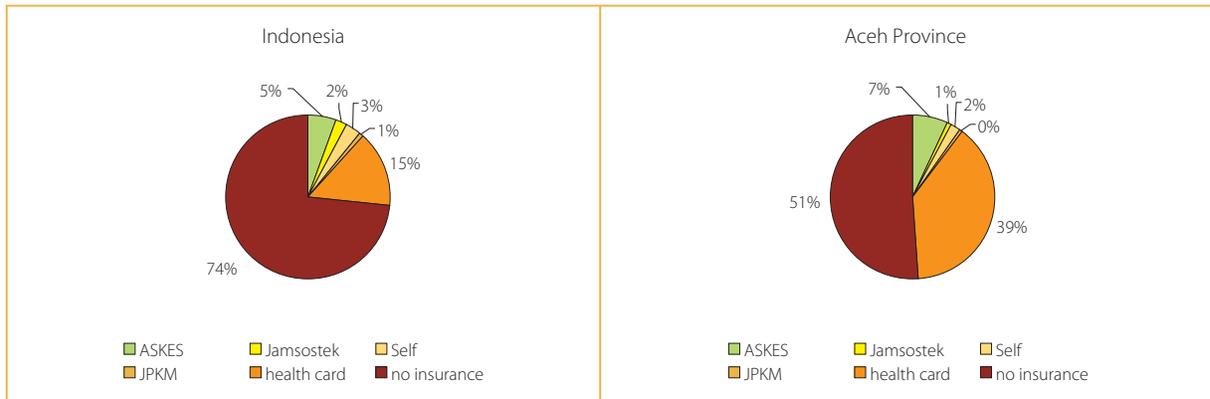
Source: Susenas, 2006, and World Bank staff calculations.

Out-of-pocket health spending is low despite relatively high utilization, as a result of high per capita public spending. In 2006, an average Acehnese household spent 2.0 percent of its total expenses on health compared with 2.8 percent in Indonesia (Table 5.3). Acehnese households contribute 31 percent of total health expenditures, while Indonesians contribute 55 percent to health expenditure. Only in 2005, after the tsunami and related increase in morbidity, did private healthcare use, and therefore household health expenditures, increase.

Government of Aceh regulations regarding free healthcare and higher insurance coverage contributed to lower private health expenditures. A 2003 regulation Qanum No. 11/2003 on Implementing and Financing of Healthcare entitles all people in Aceh to free healthcare. The national health card further entitles poor households to free care. Together, these two policies provide healthcare at Puskesmas and third-class hospital providers at no private cost. Available evidence hints at a relatively successful implementation of these policies. In addition to

higher-than-average utilization and lower than average out-of-pocket expenditure, the GDS²² results suggest that the majority of the Acehnese are receiving free healthcare. Sixty-seven percent of Puskesmas patients paid no fees and 69 percent of the Puskesmas report having no fees for outpatient services. Insurance coverage is much higher in Aceh (49 percent) than in the rest of Indonesia (26 percent), primarily as a result of the health card, available to those below the poverty line (Figure 5.3).

Figure 5.3 Health insurance coverage

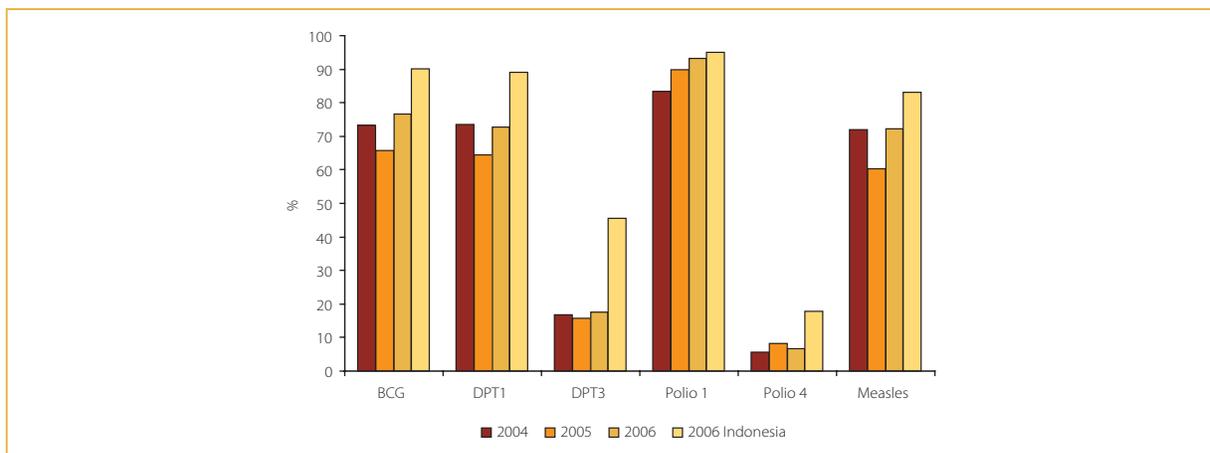


Source: Susenas, 2006, and World Bank staff calculations.

However, despite high utilization and spending, health outcomes are not significantly better than in the rest of Indonesia. Some outcomes, such as access to maternal health services, were relatively better in Aceh than in the rest of Indonesia, but have worsened in recent years as a result of the conflict and tsunami. Utilization of doctors and midwives has traditionally been high in Aceh than in Indonesia, but has fallen significantly in recent years. Assisted birth deliveries declined from 78 percent in 2003 to 69 percent in 2006. This could be linked to the increased intensity of conflict after 2001, supported by anecdotal evidence of midwives leaving rural and remote areas.

Consistently low immunization coverage decreased further after the tsunami, although the impact was short lived. Coverage of all vaccinations in Aceh is significantly lower than in the rest of the country (Figure 5.4), failing to meet the minimum target of 90 percent for measles and 80 percent for DPT coverage. Immunization coverage for most vaccinations declined in 2005 but was back at pre-tsunami levels by 2006.²³

Figure 5.4 Immunization coverage over time



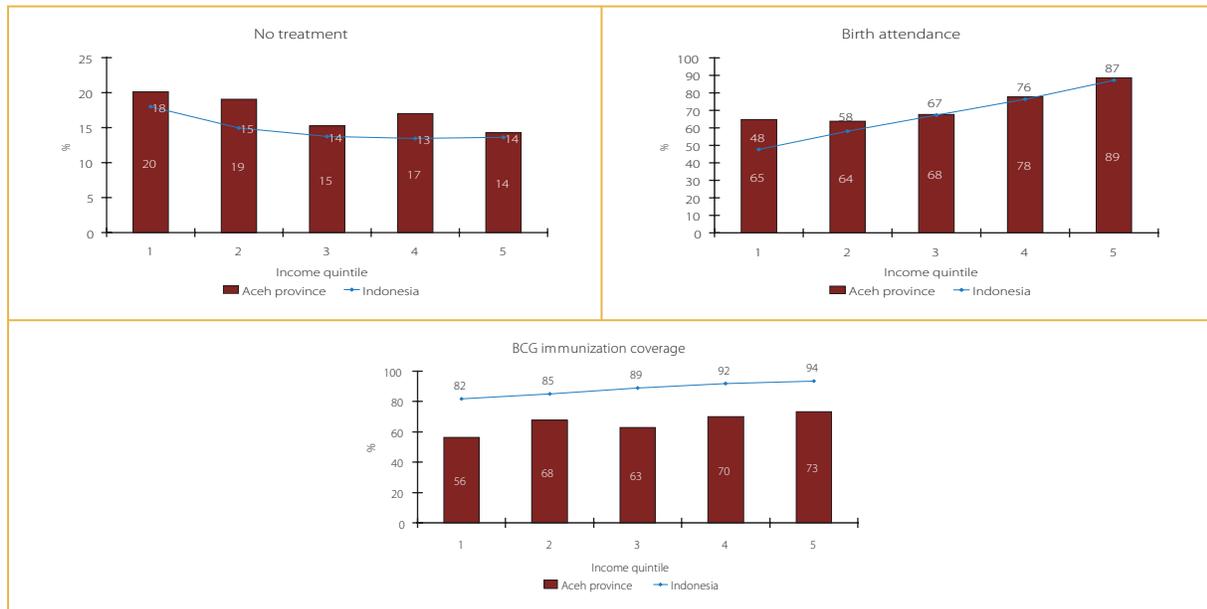
Source: Susenas, various years, and World Bank staff calculations.

22 For an explanation of the GDS methodology please see Annex B1.

23 The increase in coverage of polio immunization is likely the result of large donor efforts to improve immunization coverage.

A large share of the poor in Aceh does not seek or receive formal healthcare. Twenty percent of the poorest quintile in Aceh does not receive any treatment when ill (Figure 5.5). This compares unfavorably with Indonesia (18 percent). In Aceh more births are attended than in Indonesia. In seeking treatment, birth attendance and immunization there are stark differences between the richer and poorer segments of the population. Poorer segments of the population in Aceh concentrate utilization in public primary health centers (Puskesmas and Puskesmas Pembantu), while richer segments of the population tend to also use public and private hospitals as well as doctors' practices (Figure 5A in the annex).

Figure 5.5 Poor versus non-poor utilization of health care services



Source: Susenas, 2006, and World Bank staff calculations.

Further improvements in the efficiency and targeting of health spending are possible. By redirecting spending towards improving the quality of, and access to, those services used by the poor, primary healthcare and Puskesmas services will ensure that increases in health spending will benefit the most vulnerable and least able to afford private sector care. Investments in those services least used by the poor (public or private tertiary care) will likely benefit the poor least.

Aceh's health workforce is relatively large, but uneven distribution of doctors and midwives, partly a result of the conflict and low living standards in many rural areas, has created unnecessary gaps. Further information about the nature of the current health workforce, including both public and private providers, and about the incentives necessary to keep doctors and other health providers in remote areas, is necessary to achieve a sustainable solution to the uneven distribution of the workforce.



ANNEXES



Annex A – Tables and Figures

Table 1A Relative odds of poverty by selected household characteristics

	2004	2005	2006
0 children in HH	0.25***	0.36***	0.30***
1 child in HH	0.60***	0.54***	0.59***
2 children in HH	1.00	1.00	1.00
3 children in HH	1.80***	2.02***	1.91***
4 children in HH	2.92***	3.24***	3.16***
5+ children in HH	5.66***	6.65***	3.22***
0 adults in HH	0.71	0.42***	0.53***
1 adult in HH	0.94	0.88	0.84
2 adults in HH	1.00	1.00	1.00
3 adults in HH	1.36***	1.16	1.65***
4 adult in HH	2.36***	1.86***	2.49***
0 Elderly in HH	1,00	1,00	1,00
1 Elderly in HH	1.51***	1.63***	1,18
2 Elderly in HH	2.76***	1.81***	1.86**
HH without education	1.39*	1.72***	1.17
HH with some primary education	0.75**	1.06	1.03
HH finished primary education	1.00	1.00	1.00
HH with some senior education	0.79**	0.76***	0.71***
HH finished senior education	0.33***	0.33***	0.31***
HH with higher education	0.14***	0.09***	0.08***
Male HH	0.55***	0.74*	0.80
Female HH	1.00	1.00	1.00
Rural	1.58***	1.52***	1.49***
Urban	1.00	1.00	1.00
Agriculture	1.00	1.00	1.00
Fishery	0.68**	0.53***	0.52***
Manufacturing industry	0.47***	0.45***	0.65**
Construction	0.48***	0.75*	0.58***
Services sector	0.42***	0.34***	0.36***
Transportation	0.62***	0.54***	0.56***
Public services	0.58***	0.33***	0.38***
Other	0.31***	0.71	0.30***

Source: BPS data and World Bank staff calculations.

Note: * significant at the 10% level, ** at the 5% level and *** at 1% level.

Table 2A Relative odds of poverty by selected urban household characteristics

	2004	2005	2006
0 children in HH	0.27**	0.43**	0.23**
1 child in HH	0.66*	0.46**	0.29**
2 children in HH	1.00	1.00	1.00
3 children in HH	1.05	1.37	2.13**
4 children in HH	3.81**	2.21**	4.35**
5+ children in HH	3.38**	6.22**	2.29*
0 adult in HH	0.33	0.64	0.85
1 adult in HH	0.48	1.02	1.17
2 adult in HH	1.00	1.00	1.00
3 adult in HH	1.30	1.58*	1.26
4 adult in HH	2.91**	2.10**	2.13**
0 Elderly in HH	1.00	1.00	1.00
1 Elderly in HH	1.09	1.07	1.18
2 Elderly in HH	2.47	1.68	1.13
Male HH	0.20*	0.56	1.05
Female HH	1.00	1.00	1.00
HH without education	2.12	1.25	1.68
HH with some primary education	0.77	1.21	1.13
HH finished primary education	1.00	1.00	1.00
HH with some senior education	0.71	0.58**	0.59*
HH finished senior education	0.38**	0.31**	0.22**
HH with higher education	0.14**	0.09**	0.03**
Agriculture	1.00	1.00	1.00
Fishery	0.46*	0.49*	1.00
Manufacturing industry	0.19**	0.33*	0.35*
Construction	0.36*	0.88	0.62
Services sector	0.27**	0.27**	0.37**
Transportation	0.41**	0.66	0.66
Public services	0.47*	0.27**	0.35**
Other	0.36	0.23**	0.31*

Source: BPS data and World Bank staff calculations.

Note: * significant at the 10% level, ** at the 5% level and *** at 1% level.

Table 3A Relative odds of poverty by selected rural household characteristics

	2004	2005	2006
0 children in HH	0.23**	0.34**	0.29**
1 child in HH	0.58**	0.54**	0.64**
2 children in HH	1.00	1.00	1.00
3 children in HH	2.08**	2.17**	1.93**
4 children in HH	2.89**	3.47**	3.17**
5+ children in HH	6.71**	6.64**	3.52**
0 adult in HH	0.70	0.41**	0.5*
1 adult in HH	1.01	0.86	0.76
2 adult in HH	1.00	1.00	1.00
3 adult in HH	1.44**	1.10	1.73**
4 adult in HH	2.34**	1.85**	2.61**
0 Elderly in HH	1.00	1.00	1.00
1 Elderly in HH	1.60**	1.81**	1.18
2 Elderly in HH	2.86**	1.92**	2.12*
Male HH	0.65	0.80	0.70
Female HH	1.00	1.00	1.00
HH without education	1.39	1.80**	1.17
HH with some primary education	0.75*	1.05	1.01
HH finished primary education	1.00	1.00	1.00
HH with some senior education	0.82	0.81*	0.74**
HH finished senior education	0.32**	0.33**	0.33**
HH with higher education	0.15**	0.09**	0.10**
Agriculture	1.00	1.00	1.00
Fishery	0.70*	0.53**	0.47**
Manufacturing industry	0.59*	0.53**	0.70
Construction	0.46*	0.66*	0.55**
Services sector	0.47**	0.37**	0.36**
Transportation	0.63*	0.45**	0.60**
Public services	0.45**	0.31**	0.43**
Other	0.16**	0.95	0.40**

Source: BPS data and World Bank staff calculations.

Note: * significant at the 10% level, ** at the 5% level and *** at 1% level.

Table 4A Relative odds of poverty in tsunami and conflict affected areas

	Aceh 2004	Aceh 2005	Aceh 2006
0 children in HH	0.21***	0.34***	0.29***
1 child in HH	0.58***	0.55***	0.57***
2 children in HH	1,00	1,00	1,00
3 children in HH	1.95***	2.12***	1.79***
4 children in HH	2.9***	3.14***	2.87***
5+ children in HH	5.42***	5.32***	2.87***
0 adult in HH	0.56*	0.34***	0.39***
1 adult in HH	0,96	0,82	0.71***
2 adult in HH	1,00	1,00	1,00
3 adult in HH	1.36***	1.18*	1.66**
4 adult in HH	2.00***	2.04***	2.68***
0 Elderly in HH	1,00	1,00	1,00
1 Elderly in HH	1.39***	1.42***	1,11
2 Elderly in HH	2.23***	1.57**	1.67*
Male HH	0.67***	0.71***	0.59***
Female HH	1,00	1,00	1,00
HH without education	1,31	1.55***	0,94
HH with some primary education	0,82	0,97	0,89
HH finished primary education	1,00	1,00	1,00
HH with some senior education	0.82*	0.79**	0.73***
HH finished senior education	0.31***	0.35***	0.33***
HH with higher education	0.1***	0.08***	0.09***
Rural	1.58***	1.55***	1.68***
Urban	1,00	1,00	1,00
High tsunami	0.83**	1.44***	1,08
Low tsunami	1,00	1,00	1,00
High conflict	1.29***	1.43***	0,96
Low conflict	1,00	1,00	1,00

Source: BPS data and World Bank staff calculations.

Note: * significant at the 10% level, ** at the 5% level and *** at 1% level.

Table 5A Revenue by kabupaten and source in Aceh, 2004

Rp billion

Kabupaten/Kota	PAD	Tax Sharing	Non-Tax Sharing	DAU	DAK	Other	Total
Prop.Aceh	198.4	49.8	1,825.8	76.1	-	107.8	2,258.0
Kab. Aceh Barat	5.5	9.1	31.6	117.6	9.8	23.9	197.5
Kab. Aceh Besar	4.8	8.2	48.1	192.2	7.1	39.7	300.1
Kab. Aceh Selatan	3.7	9.0	34.5	128.7	8.5	25.4	209.8
Kab. Aceh Singkil			-	106.0	7.8	-	113.8
Kab. Aceh Tengah	7.2	8.8	15.9	158.7	8.4	40.0	238.9
Kab. Aceh Tenggara	4.4	7.8	31.8	122.5	8.5	14.7	189.6
Kab. Aceh Timur	3.8	27.3	78.3	143.9	10.9	10.4	274.6
Kab. Aceh Utara	38.1	41.7	197.7	199.9	6.9	269.8	754.1
Kab. Bireuen	4.2	21.6	35.4	160.0	10.9	30.8	262.9
Kab. Pidie	5.5	10.2	49.7	233.3	11.3	56.2	366.2
Kab. Simeuleu			-	90.0	7.2	-	97.2
Kota Banda Aceh	9.5	12.4	26.2	146.1	11.4	25.0	231.2
Kota Sabang	5.5	11.1	25.7	80.3	5.5	7.0	135.1
Kota Langsa	2.4	10.2	16.5	86.0	10.7	24.3	150.0
Kota Lhokseumawe	9.4	39.8	28.6	95.5	9.5	4.5	187.2
Kab. Aceh Barat Daya	2.7	5.2	34.0	81.0	5.5	11.6	139.9
Kab. Gayo Lues	2.7	3.7	27.6	85.7	5.5	1.5	126.7
Kab. Aceh Tamiang	4.1	23.6	40.3	92.0	18.2	5.8	184.1
Kab. Nagan Raya	2.3	35.6	-	98.1	5.5	8.7	150.2
Kab. Aceh Jaya*	1.0	3.7	34.3	43.8	10.0	0.5	93.3
Kab. Bener Meriah				92.0	-	-	92.0

Source: World Bank staff calculations based on data from SIKD/ MoF, 2004.

Table 6A Revenue per capita by kabupaten and source in Aceh, 2004*Rupiah*

Kabupaten/Kota	PAD	Tax Sh.	Non-tax Sh.	DAU	DAK	Other	Total
Prop.Aceh	48,527	12,185	446,497	18,616		26,367	552,193
Kab. Aceh Barat	34,035	55,892	194,920	724,869	60,185		
Kab. Aceh Besar	15,940	26,994	158,717	634,284	23,483		990,274
Kab. Aceh Selatan	19,694	48,105	184,679	688,720	45,742		
Kab. Aceh Singkil			-	720,736	53,018	-	-
Kab. Aceh Tengah	24,873	30,413	55,302	551,340	29,048		830,051
Kab. Aceh Tenggara	25,942	46,506	188,744	727,638	50,443	87,474	
Kab. Aceh Timur	12,268	87,564	250,864	461,114	34,928	33,253	879,992
Kab. Aceh Utara	78,029	85,498	405,642	410,153	14,240		
Kab. Bireuen	12,097	61,745	101,311	457,866	31,287	88,208	752,513
Kab. Pidie	11,521	21,610	104,945	492,703	23,775		773,313
Kab. Simeuleu			-	1,260,242		-	-
Kota Banda Aceh	39,618	51,932	109,813	614,208	47,894		968,383
Kota Sabang	191,267	391,211	902,356	2,817,157			
Kota Langsa	17,843	75,843	122,645	640,407	79,335		
Kota Lhokseumawe	67,887	286,713	205,981	688,446	68,503	32,221	
Kab. Aceh Barat Daya	24,400	46,302	305,063	727,590	49,385		
Kab. Gayo Lues	38,877	54,253	404,766	1,257,281	80,657	22,511	
Kab. Aceh Tamiang	17,812	103,317	176,220	402,115	79,557	25,362	804,383
Kab. Nagan Raya	20,800	318,980	-	879,670	49,319	78,120	
Kab. Aceh Jaya*	10,304	39,121	365,270	466,836		5,227	993,245
Kab. Bener Meriah				899,107			-

Source: World Bank staff calculations based on data from SIKD/ MoF, 2004.

Table 7A Composition of regional spending based on new budget format (apparatus and public services) in Aceh, 2003-05

Expenditure	2003						2004						2005					
	Province		Kab/Kota		Total		Province		Kab/Kota		Total		Province		Kab/Kota		Total	
	Rp bn	%	Rp bn	%														
Government apparatus expense	553.0	34.7	2,197.3	34.9	2,750.3	34.8	606.8	37.2	2,569.5	38.5	3,176.3	38.3	555.0	40.9	2,469.8	39.8	3,024.7	40.0
General administration	362.4	22.7	1,646.6	26.1	2,009.0	25.4	381.4	23.4	1,880.1	28.2	2,261.4	27.2	328.9	24.2	1,929.0	31.1	2,257.9	29.9
Capital	86.5	5.4	259.5	4.1	346.0	4.4	80.0	4.9	284.5	4.3	364.5	4.4	96.9	7.1	295.0	4.8	391.9	5.2
Operational & maintenance	104.1	6.5	291.2	4.6	395.3	5.0	145.5	8.9	404.9	6.1	560.4	6.6	129.2	9.5	245.8	4.0	375.0	5.0
Public expense	1,037.0	65.0	3,503.6	55.6	4,540.7	57.5	1,020.4	62.6	3,453.2	51.8	4,473.6	53.9	790.8	58.2	3,154.2	50.9	3,945.0	52.2
General administration	33.3	2.1	1,416.9	22.5	1,450.3	18.4	20.9	1.3	1,498.8	22.5	1,519.7	18.3	12.1	0.9	1,128.8	18.2	1,140.9	15.1
Capital	460.3	28.9	1,046.9	16.6	1,507.2	19.1	457.6	28.1	1,015.2	15.2	1,472.8	17.7	332.5	24.5	1,151.7	18.6	1,484.2	19.6
Operational & maintenance	543.4	34.1	1,039.8	16.5	1,583.2	20.0	541.8	33.2	939.2	14.1	1,481.0	17.8	446.2	32.9	873.6	14.1	1,319.8	17.5
Unexpected expenses	4.2	0.3	145.5	2.3	149.6	1.9	2.8	0.2	142.2	2.1	145.0	1.7	12.4	0.9	96.2	1.6	108.6	1.4
Financial assistance & sharing expense			457.0	7.3	457.0	5.8			505.7	7.6	505.7	6.1			477.8	7.7	477.8	6.3
Total capital expenditure	546.8	34.3	1,306.4	20.7	1,853.2	23.5	537.6	33.0	1,299.7	19.5	1,837.2	22.1	429.4	31.6	1,446.7	23.3	1,876.1	24.8
Total	1,594.3	100.0	6,303.4	100.0	7,897.7	100.0	1,630.1	100.0	6,670.6	100.0	8,300.6	100.0	1,358.2	100.0	6,198.0	100.0	7,556.2	

Source: World Bank staff calculations based on data from World Bank Decentralization Database and SKD/MoF. Data are in real terms (constant 2006 prices).

Table 8A Trend in net enrolment rates Aceh vs Indonesia

Percent

	Aceh	North Sumatra	Indonesia
NER SD	95.5	94.0	93.5
NER SMP	78.4	73.1	66.5
NER SMA	57.1	54.1	43.8
NER Diploma/ S1	17.5	11.6	10.5
GER SD	113.4	111.6	110.0
GER SMP	96.5	89.5	81.9
GER SMA	73.7	68.8	56.7
GER Diploma/ S1	29.9	18.8	17.9
Literacy (15-24 yrs)	98.8	98.9	98.8

Source: Susenas, 2006, and World Bank staff calculations.

Table 9A Trend in net enrolment rates Aceh vs Indonesia

Percent

	Aceh			Indonesia		
	NER SD	NER SMP	NER SMA	NER SD	NER SMP	NER SMA
1993	91.1	53.9	32.9	91.1	46.7	30.5
1996	93.0	60.0	32.6	91.5	54.5	34.8
1999	94.3	60.0	36.5	92.6	59.1	38.4
2004	94.6	80.3	63.8	93.0	65.2	42.9
2005	93.1	73.7	54.5	93.2	65.2	41.7
2006	95.5	78.4	57.1	93.5	66.5	43.8

Source: Susenas, various years, and World Bank staff calculations.

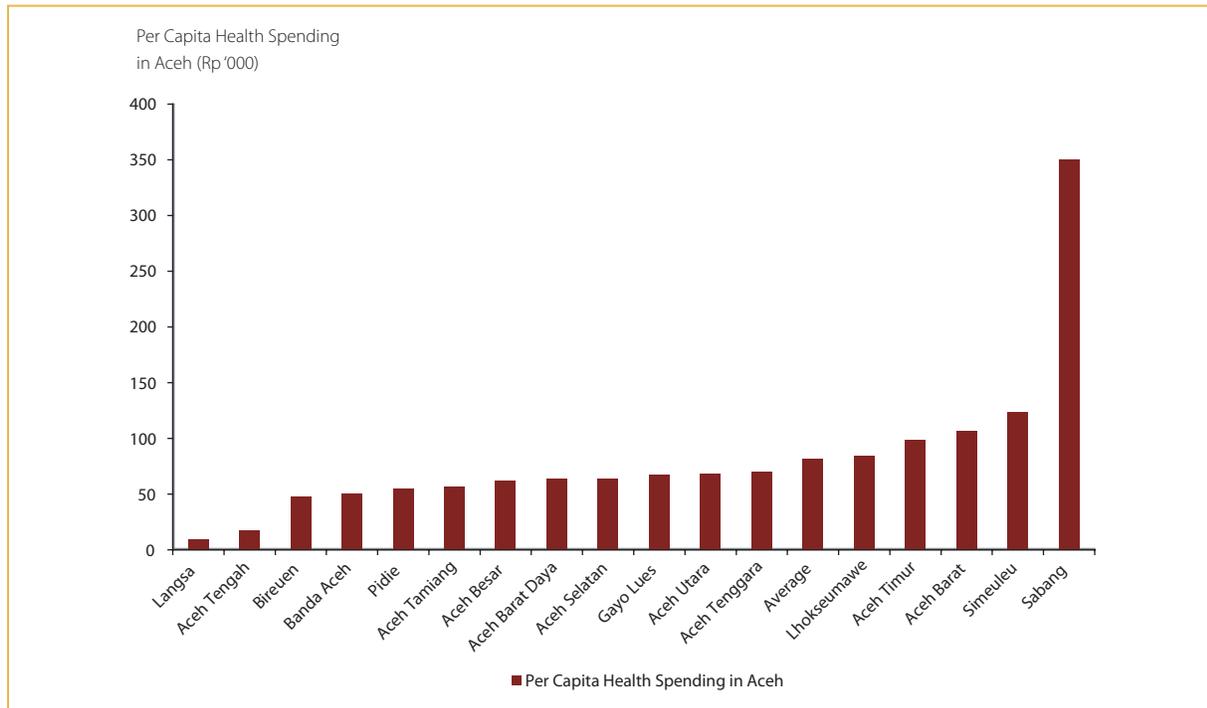
Table 10A Healthcare utilization rates

Percent

	Aceh	North Sumatra	Indonesia
Only public	21.4	10.2	15.3
Only private	11.7	17.1	16.5
Any combination	5.1	2.2	2.4
Total healthcare	38.2	29.4	34.1
Only traditional	0.1	0.0	0.0
Only self	41.5	50.7	51.2
None	20.3	19.9	14.6
Total none, self, traditional	61.8	70.6	65.9
By sick population	34.5	21.5	28.1

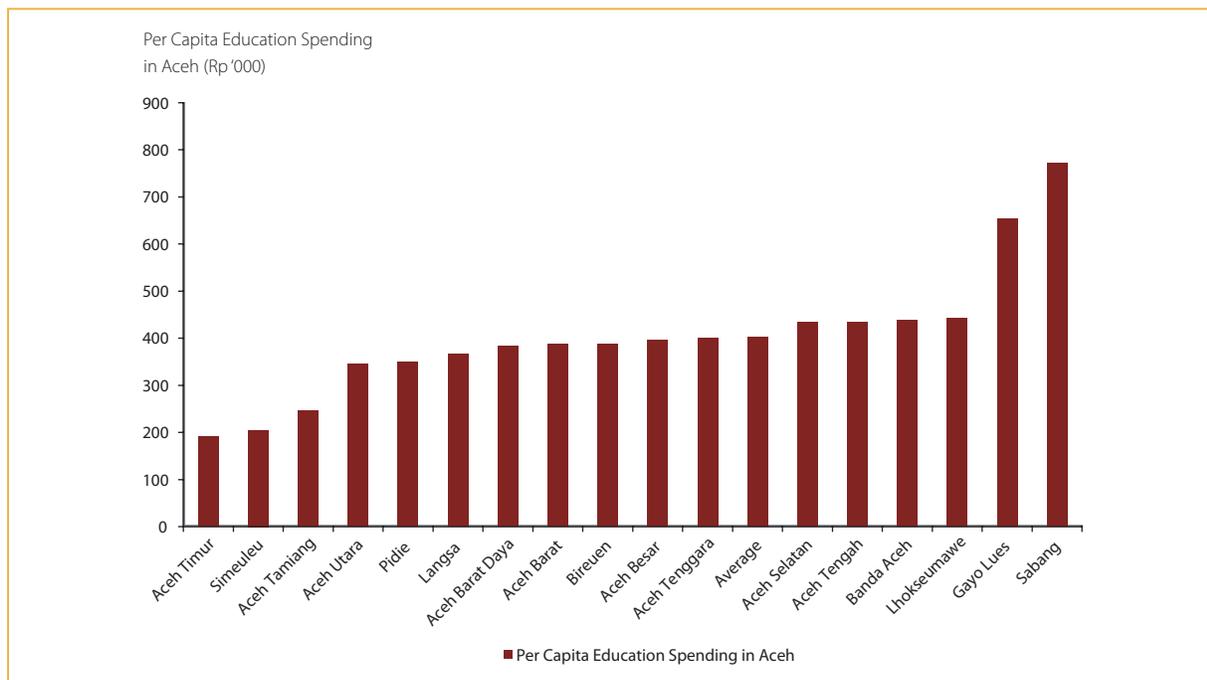
Source: Susenas, 2006, and World Bank staff calculations.

Figure 1A Per capita district health expenditures in Aceh, 2004



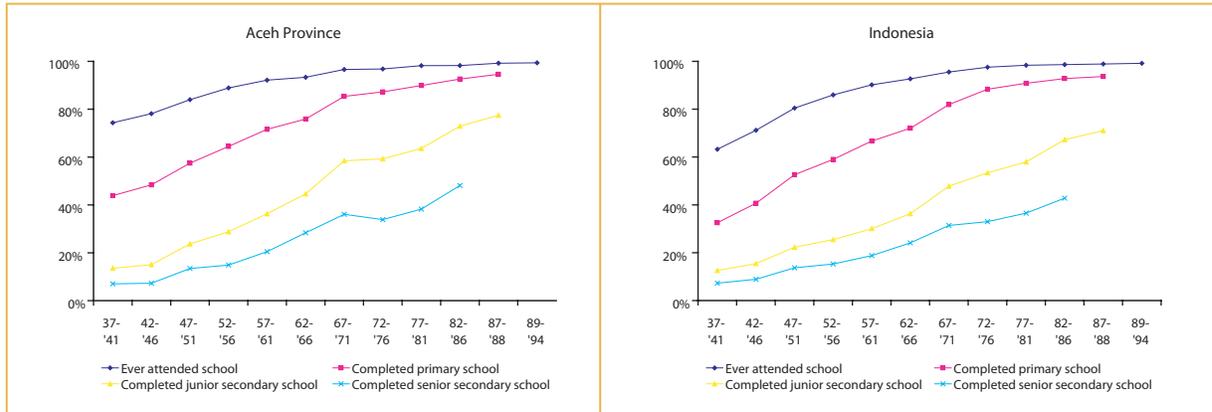
Source: World Bank staff calculations based on MoF data (constant 2006 prices).

Figure 2A Per capita district education expenditures in Aceh, 2004.



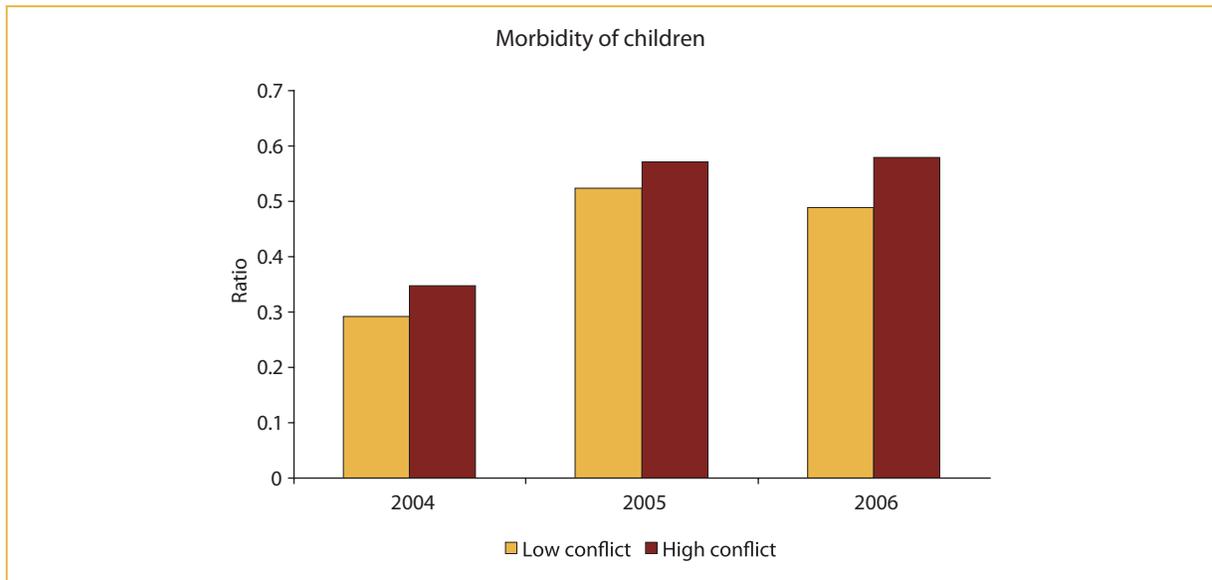
Source: World Bank staff calculations based on MoF data (constant 2006 prices).

Figure 3A Educational attainment by birth year, 1937-94



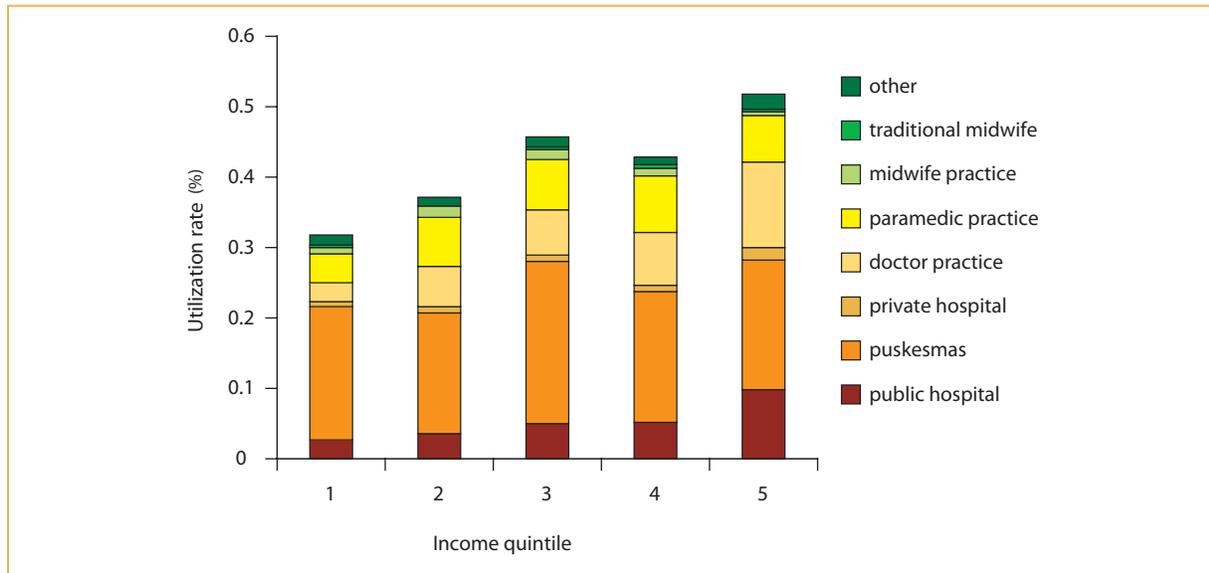
Source: Susenas, 2005, and World Bank staff calculations.

Figure 4A Morbidity is higher in conflict-affected areas



Source: Susenas, various years, and World Bank staff calculations.

Figure 5A Type of utilization by income quintile



Source: Susenas, 2005, and World Bank staff calculations.

Annex B – Methodological Notes

B1 Governance and Decentralization Survey (GDS)

The Governance and Decentralization Survey 2, following the GDS 1+ in 2002, is a survey fielded across 132 Indonesian districts (*kabupaten/kota*) and 31 provinces between May and August 2006. The GDS sought to provide insights into the measurement of post-decentralization public service delivery levels and trends across a range of sectors, including health, education, basic infrastructure, administrative services, and the police. Furthermore, it sought to capture prevailing local incentive relationships and health and education facilities financing that govern the provision of these services.

Ninety *kabupaten* (districts) and *kota* (municipality) were randomly selected throughout Indonesia. Data from 5 districts in Aceh (Aceh Barat, Aceh Besar, Aceh Singkil, Banda Aceh, and Simeulue) was used for this report. Citizens' experiences of service delivery and governance are linked with perspectives from local officials, health and education facilities, and district-level (*kabupaten/kota*) policy-makers. The sample included 298 household respondents from 60 hamlets using the Probability Proportional to Size (PPS) random sample, and respondents from 30 elementary schools, 15 junior high schools, and 14 Puskesmas.

B2 Estimating poverty levels over the 2004-06 period in Aceh

Any poverty estimate depends essentially on two empirical constructs: (1) the distribution of a widely accepted measure of household or individual welfare (most commonly a consumption based measure) that can be expressed in monetary terms, and (2) a money-metric poverty line. The money-metric poverty line represents a threshold level of welfare below which a household or individual is said to be "poor". There are various methods all anchored in particular definitions of a welfare threshold, that can yield candidate poverty lines. Ravallion (2002) provides a review of such methods.

The specific empirical approach in this report is to adopt as a starting point the 2004 official government poverty estimates for Aceh. The estimates of per capita household consumption come from the National Socio-Economic Survey, or Susenas. Applying the official estimates of a 17.6 percent poverty incidence in urban areas and a 32.6 percent poverty incidence in rural areas to the observed distributions of consumption yields a poverty line of Rp 134,305 per person per month in urban areas and Rp 118,709 in rural areas. These are the values of the estimated poverty lines in Aceh for February 2004, the month in which the 2004 Susenas was collected.

When comparing poverty levels over time, one widely accepted requirement is for the comparison to be welfare consistent – that is, the poverty line in each year should represent the same reference level of consumption updated only to take account of nominal price changes. In order to provide a welfare consistent update to the 2004 poverty line for the years 2005 and 2006 the first step is to determine a consumption bundle representative of the actual consumption of the poor. The approach adopted here looks at the consumption choices of households around the 2004 poverty line by estimating median consumption shares of 19 main commodity aggregates as recorded in Susenas. Households near the poverty line are defined as those that fall within the expenditure quintile centered around the 2004 poverty line, i.e. those urban households in the 7.6th percentile to the 27.6th percentile and those rural households from the 22.6th percentile to the 42.6th percentile. This exercise generates different consumption weights for urban and rural households reflecting both different consumption patterns and a different initial money-metric threshold of welfare reflecting differences in the prices of key commodities between urban and rural areas. Table B2.1. presents these estimated consumption weights.

Table B2.1 Urban and rural budget shares by commodity category

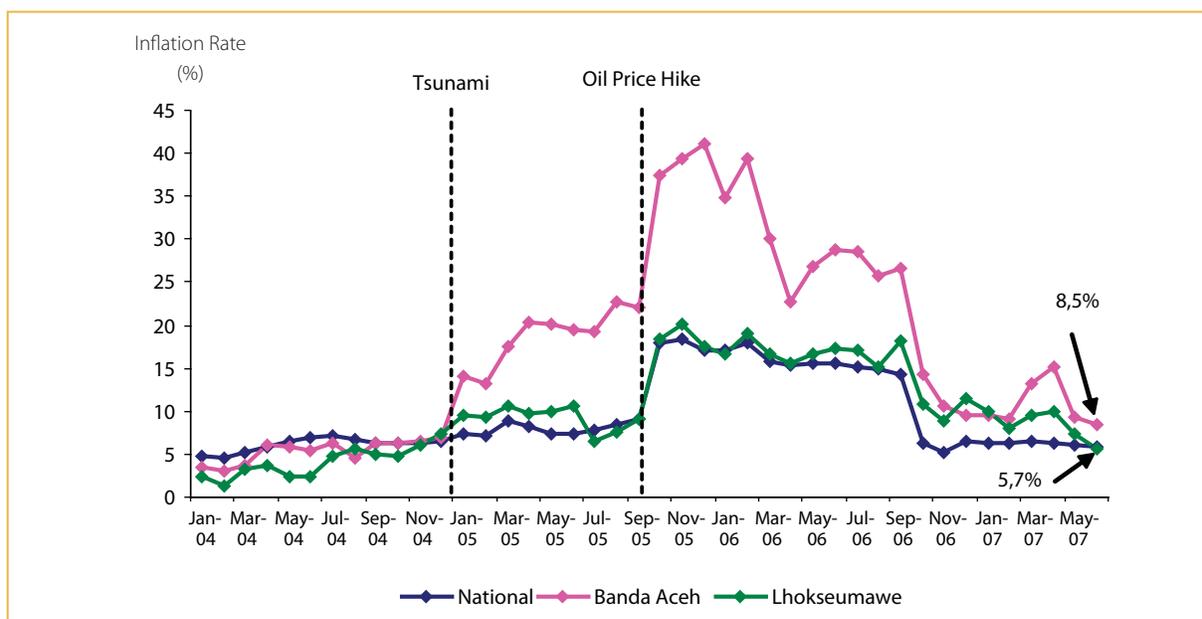
Consumption category	Urban budget share	Rural budget share
Cereal, cassava and their products	0.153	0.134
Fresh fish	0.111	0.115
Preserved fish	0.016	0.017
Eggs, milk and their products	0.031	0.031
Vegetables	0.038	0.035
Beans and nut	0.013	0.014
Fruits	0.022	0.024
Spices	0.050	0.046
Fats and oils	0.035	0.030
Other foods items	0.010	0.010
Prepared food	0.025	0.029
Beverages	0.005	0.006
Tobacco	0.088	0.106
Cost for housing	0.088	0.086
Fuel, electricity and water	0.065	0.069
Household equipment	0.002	0.001
Clothing	0.047	0.047
Health	0.024	0.024
Education, recreation and sports	0.015	0.015
Transport, communication and finance	0.016	0.016
Total household budget covered	0.852	0.854

Source: BPS data and World Bank staff calculations

*Note: two commodity aggregates, meat and meat products and household maintenance have a median budget share of zero and hence not included in this table.

The next step applies these consumption weights to the corresponding commodity disaggregated Aceh price series collected by BPS. BPS records prices in two main Acehese cities: Banda Aceh and Lhokseumawe. The population weighted average of the price changes observed in these two cities is then taken as the average price change in the province over the period of interest. The 2004 populations for the two cities were about 239,000 in Banda Aceh and 139,000 in Lhokseumawe. Hence the Banda Aceh price series is given a weight of 0.63 while the Lhokseumawe series is weighted at 0.37.

The high and varying inflation levels recorded in Aceh post-tsunami make poverty inferences post-tsunami more challenging. Following the tsunami there were substantial inflationary pressures due to shortages of key commodities, disrupted transport networks, and, later, increased demand spurred by reconstruction activities (Figure B2.1). Between the time of the 2004 and 2005 surveys, the price level increased 43 percent in Aceh, compared with 31 percent in neighboring North Sumatra. Furthermore, there was wide variation in the magnitude of the price changes within the province— while overall prices increased 51 percent in Banda Aceh, they increased only 35 percent in Lhokseumawe.

Figure B2.1 Aceh suffered from very high inflation levels after the tsunami

Source: BPS data and World Bank staff calculations.

Taking an average of these price changes will yield valid mean inferences at the provincial level but may mischaracterize poverty change at a more local level given price change heterogeneity. For example if prices did not rise as rapidly in rural areas as in the cities then the magnitude of any rural poverty change would be overstated by the methods used in this report. Unfortunately, no known source of price data captures this degree of local area heterogeneity in price change, and hence any sub-provincial poverty inference based on these methods will be a noisier estimate of true poverty than inferences at the province level. Updating the 2004 poverty lines with the generated price series results in the poverty lines listed in Table B2.2.

Table B2.2 Estimated poverty lines at the time of the Susenas household surveys

Rupiah

Year	Month	Urban poverty line	Rural poverty line
2004	February	134,305	118,709
2006	January	196,986	174,008
2006	August	202,829	179,199

Source: BPS data and World Bank staff calculations.

B3 Measuring Conflict Intensity

This report uses an index (Conflict Intensity Index) to measure conflict at the kecamatan level in Aceh, recognizing that although the whole of Aceh was directly or indirectly affected by the violent conflict, the conflict had a higher impact on some *kecamatan* and a lower impact on others. As part of the design and development of the Community-Based Assistance for Conflict Victims program, BRA with technical assistance from the World Bank and other partners developed a Conflict Intensity Index.

The conflict intensity index categorises *kecamatan* in Aceh into three categories of intensity: high, medium and low. For the purpose of this report, we have divided the *kecamatan* into two categories, conflict affected (high

and medium) and non conflict affected (low). In total, the index covers 227 rural *kecamatan* and is based on nine indicators, which were weighted using factor analysis. These indicators are from six datasets compiled by Dinsos (Department of Social Welfare), Kodam (Provincial Military Command), IOM, the World Bank, and conflict incidents as reported in two newspapers (Aceh Kita and Serambi). Table B3.1. summarizes the indicators, their sources, and their geographical *kecamatan* coverage:

Table B3.1 Conflict intensity index indicators

No	Indicator	Source	Coverage (%)
1	Number of conflict victims (2002)	Dinsos	61
2	Number of conflict victims (2003)	Dinsos	81
3	Number of conflict victims (2004)	Dinsos	81
4	Military conflict intensity	Kodam	92
5	GAM returnee estimates	AMM/WB	100
6	Political prisoner returnees	IOM	100
7	GAM-Gol conflict incidents (2005)	Aceh Kita & Serambi (WB dataset)	100
8	Perceptions of safety (pre-MoU)	WB survey	63
9	Perceptions of GAM-Gol conflict (2004)	WB survey	63

In order to cross-check this quantitative data, it was necessary to verify the conflict intensity index by considering local knowledge and perceptions of conflict intensity. Therefore, for each *kabupaten* the index was cross-checked with two (sometimes three) *kabupaten*-based actors with experience in local conflict mapping: (i) the World Bank SPADA consultants who have undertaken intensive social and conflict mapping in 2005 and 2006; and, (ii) the IOM Community Technical Assistants who undertook conflict mapping in 2005. Overall, the consultations indicated that the conflict intensity index was broadly accurate. Although the local consultants differed in the exact order they ranked *kecamatan*, they agreed on which *kecamatan* would fall within the high and medium categories. Only a small number of *kecamatan* had their conflict intensity upgraded, whereas no *kecamatan* were downgraded. Based on this index we estimate the following numbers of high, medium and low conflict-affected *kecamatan* and villages in Aceh:

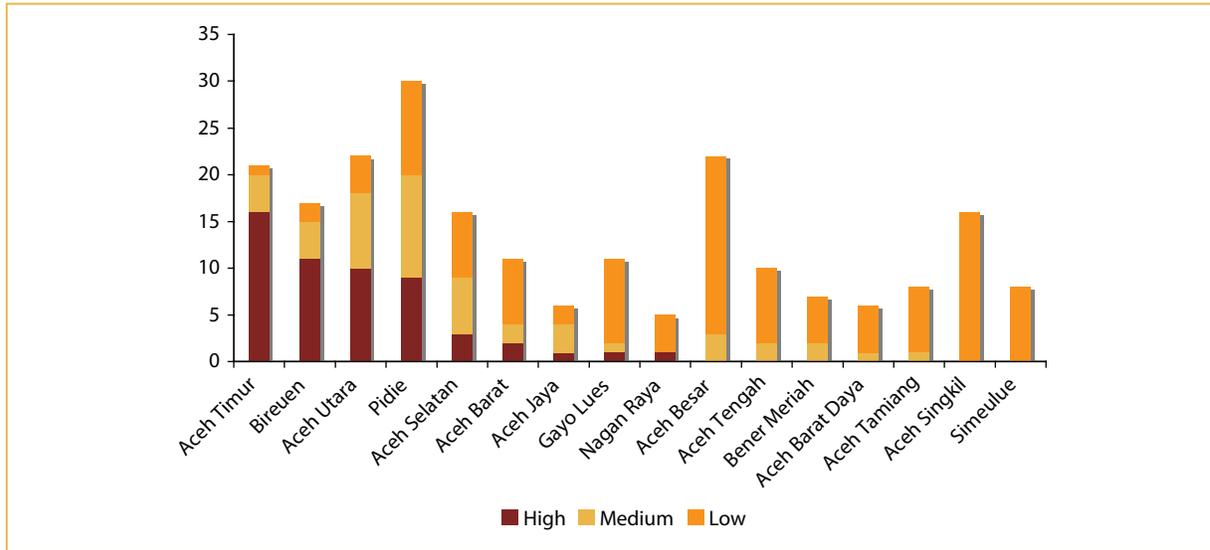
Table B3.2 Kecamatan and village breakdown of conflict intensity

Conflict intensity	Kecamatan	Villages
High	54	1,535
Medium	52	1,694
Low	121	2,659
Total	227	5,888

Source: World Bank/Kecamatan Development Program, 2007.

Geographically, high intensity *kecamatan* are concentrated on the east coast whereas those with medium and low intensity tend to be concentrated on the west coast and in the central highlands (Figure B3.1 and B3.2).

Figure B3.1 High, medium and low intensity kecamatan by kabupaten



Source: World Bank/Kecamatan Development Program, 2007, and World Bank staff calculations.

B4 Measuring Tsunami Intensity

The tsunami indicator used the village damage index constructed from the KDP village survey. The KDP survey was conducted in August and September 2006 and covers all rural villages in Aceh, some 5,698 villages in 221 *kecamatan* and 18 districts. The response rate for the survey was very high: 98 percent or 5,587 villages responded on the social questionnaire; and 94 percent or 5,356 villages for the infrastructure questionnaire. The village damage index used only the infrastructure assessment.

The infrastructure assessment evaluated the village level infrastructure situation in Aceh to document the current status of damage, causes of damage, and repair/reconstruction status. The survey examined 57 types of infrastructure that were grouped into nine main categories: roads/transportation; bridges; water and sanitation; electricity; irrigation; village facilities; economic facilities; residential structures; and productive land. The infrastructure assessment also identified the cause for the damage, the conflict, natural disaster (including tsunami and earthquake) and lack of maintenance.

To calculate the village damage index, the average damage across all types of infrastructure was calculated for the main categories of infrastructure (transport, bridges, water supply and sanitation, electrical, irrigation, community facilities, economic facilities, housing, and land), weighted by the percentage of villages that reported to have each type of infrastructure within a category. The percentage damaged was converted to an index by taking the integer value found by dividing the percentage by 10. The highest possible index was 10, reached if 100 percent of the infrastructure was damaged; while the lowest possible index was 0 (i.e. less than 10 percent of infrastructure was damaged). The overall index for district was calculated by converting the average un-weighted percentages of the nine categories into an index.

The index can be transformed into a 'tsunami' indicator by looking only at damage caused by the tsunami. To allow for analysis, we defined (as in the KDP village survey) that a village where more than 15 percent of infrastructure was damaged by the tsunami to be highly affected by the tsunami, while those villages where less than 15 percent of all infrastructure was damaged by the tsunami are 'low tsunami affected areas'.

Those districts most affected by the natural disaster: Aceh Jaya, Simeulue and Bireuen show the highest disaster-related damage. Most districts in Aceh reported significant damage, but the cause of the damage varied. Table B4.1 shows the conflict and disaster indices by district. Fifteen districts have a disaster index higher than 1.5, while 11 have an index over 2.5. Aceh Jaya is the highest by far, with more than 50 percent of disaster-related infrastructure damage, followed by Simeulue and Bireuen (4.93 and 3.74, respectively). Districts in the interior had lower scores, as did those on the north coast far from Banda Aceh, such as Aceh Tamiang and Aceh Timur.

Table B4.1 Conflict and natural disaster related damage indexes by district

District	Conflict Indicator	Tsunami Indicator
Aceh Timur	3.63	1.47
Aceh Jaya	1.75	5.46
Aceh Barat	1.49	3.38
Bener Meriah	3.34	0.81
Simeulue	0.22	4.93
Nagan Raya	2.11	2.01
Bireuen	1.04	3.74
Pidie	1.65	2.65
Aceh Besar	0.74	3.17
Aceh Utara	1.64	2.35
Aceh Singkil	0.80	3.15
Aceh Selatan	1.56	3.00
Gayo Lues	1.50	2.75
Aceh Barat Daya	0.56	2.79
Lhokseumawe	1.35	1.11
Aceh Tenggara	0.87	2.67
Aceh Tengah	0.46	1.85
Aceh Tamiang	0.69	1.76

Source: Aceh Village Survey, 2006.

Note: For Lhokseumawe, only one out of three *kecamatan* is included in the survey.

For a more detailed description of the methodology as well as survey results please see World Bank/ Kecamatan Development Program, 2007.

B5 Why there are different poverty estimates in Aceh in 2005?

This report estimates that poverty in Aceh in 2005 was 32.6%. BPS has published two different poverty figures for Aceh in 2005, one estimate of 28.69% and another one of 49.85%. Are these estimates reliable? Are they all correct or wrong? None of them are wrong, they use different definitions of poverty and different methodologies, and therefore produce slightly different poverty estimates (see BPS, 2005, for an explanation of the methodology followed by BPS to estimate poverty). The table below summarizes the different poverty estimates for Aceh.

Table B5.1 Different poverty estimates in Aceh 2005

	Urban	Rural	Total
Poverty rate (%)			
World Bank - Susenas	20.4	36.2	32.6
BPS-Susenas	19.04	32.60	28.69
BPS-Social Economy Census			
• Near poor, poor, very poor			49.85
• Poor and very poor			30.2
Poverty line (Rp)			
World Bank - Susenas	196,986	174,008	
BPS-Susenas	195,882	166,608	172,084
BPS-Cash transfer			
• Near poor	Food consumption between 2100-2300 calories person/day + Rp 175,000 person/month of non-food.		
• Poor	Food consumption between 1900 and 2100, calories day/person + Rp 150,000 person/month of non-food.		
• Very poor	Food consumption less than 1900 calories person/day + Rp 120,000 person/month of non-food.		

Source: BPS and World Bank.

Poverty Estimates Using Susenas

The differences in the estimation of poverty arise from using (i) a different price index and (ii) a different consumption basket to estimate consumption.

Data Source

BPS uses the consumption module, with a more extensive questionnaire to estimate consumption than the 'core module' of Susenas. This report uses the core module of Susenas, to allow for poverty inferences at the provincial level in 2004-06.

Price Index

BPS uses unit values estimated from the consumption module to construct the price index from these unit values to deflate expenditure estimates. This report uses a weighted average of the CPI published by BPS for two cities in Aceh (Banda Aceh and Lhokseumawe).

Consumption Basket

The consumption module used by BPS covers a basket of 52 food items and 36 non-food items, consumed by a reference population identified. This reference population is obtained from 20 percent of the population above the estimated 2005 poverty line, which is based on the 2004 poverty line adjusted by inflation in 2005. This report uses 19 aggregates food and non-food commodities from the core Susenas.

Poverty Estimates Using the Social Economy Census

Another estimate of poverty in Aceh was calculated by BPS to determine "poor households" for the distribution of cash transfer program (Bantuan Langsung Tunai, or BLT). Poor households are determined based on 14 criteria (see Table B5.2) which are considered to be the most pertinent indicators of poverty in Indonesia. The data source,

BPS Social Economy Census (Pendataan Sosial Ekonomi), is specifically designed to identify poor households for cash transfer distribution. By definition, poor households include the very poor, poor, and near poor. By including all three of these categories, the poverty rate in Aceh reached 49.85 percent in 2005. It is important to note that this measurement includes households that are *near poor*, and these are excluded from the World Bank and BPS estimates using Susenas. By including only the more strict definition of poor (poor and very poor), the estimated poverty rate in Aceh would be 30.2 percent, very close to both the World Bank and the BPS estimate using Susenas. Similarly, given the large percentage of the population clustered around the poverty line, a slightly higher poverty line (e.g. to include the ‘almost poor’) would result in poverty estimates using Susenas that are very similar to those using the Social Economy Census.

Table B5.2 Criteria of poor households for the distribution of cash transfer program in 2005

No	Variable	Poor household criteria
1	Size of house floor	Less than 8 m ² per person
2	Type of house floor	Dirt/bamboo/cheap wood
3	Type of wall	Bamboo/ <i>rumbia</i> /low quality wood/non-plasted wall
4	Sanitation facility (toilet)	None/sharing with other household
5	Source of lighting	Non-electricity
6	Source of clean water	Well/un-protected water source/river/rain water
7	Source of power for daily cooking	Wood/charcoal/kerosene
8	Meat/milk/chicken consumption per week	Never/once in a week
9	New clothes for every household member in a year	Never/only 1 set in a year
10	Main meal in a day per person in household	Only 1 meal/two meals in a day
11	The ability to pay for medical treatment to Puskesmas/Polyclinic	Not able to pay
12	The main occupation of head of household	Farmer with farming land 0.5 ha/agriculture labor, fishermen, construction labor, livestock labor, or other occupations with income less than Rp 600,000 per month
13	The highest level of educational attainment of head of household	No schooling/not graduated elementary school/only graduated elementary school
14	Ownership of assets/saving	No saving/or things that are easy to sell at minimal price Rp 500,000,(e.g., motorcycle, gold, livestock, color TV, or other capital

Source: BPS.

B6 Description of the Study of Tsunami Aftermath and Reconstruction (STAR)

STAR is a collection of rich longitudinal survey data in combination with satellite-based measures of destruction caused by the tsunami. Pre-tsunami baseline data are provided by a broad-purpose household survey conducted by Statistics Indonesia in early 2004 in tsunami-affected areas (the 2004 Susenas) and in comparable areas that were not directly affected by the tsunami. STAR fieldworkers then located and, if alive, re-interviewed the same respondents in 2005, 2006, and 2007. This activity is planned to continue through 2010.

The STAR study has two main goals. First, using longitudinal survey data collected prior to the disaster then soon after the tsunami and annually for another four years, STAR documents the immediate, medium-term and longer-term

consequences of the disaster for mortality, family disruption and relocation, physical and mental health, economic resources and opportunities, and housing stock and physical infrastructure. Second, STAR traces the reconstruction of lives and livelihoods in the aftermath of the disaster, paying particular attention to the roles of social and economic resources prior to the disaster, as well as kinship and social networks, and receipt and leveraging of external aid.

The first follow-up survey after the tsunami, consisting of a re-survey of almost 10,600 households in Aceh and North Sumatra, began in May 2005 and was concluded with a successful re-contact rate²⁴ of over 92 percent of the individuals surveyed in the baseline (Susenas, 2004). Additional information was collected from the communities in which these individuals now live. A wide range of information on tsunami and reconstruction experiences, as well as health and socio-economic behaviors and outcomes, is collected.

The core investigative team supervising this study includes Elizabeth Frankenberg and Duncan Thomas, professors of Public Policy and Economics at Duke University, Bondan Sikoki, the director of SurveyMETER, and Jed Friedman, an economist with the World Bank. Principal funding for this study was provided by the US National Institute of Health, with supplementary funds from the World Bank and the Hewlett Foundation.

24 Re-contact is defined here as either a successful re-interview or the confirmed death of potential respondents.

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