

## Does violent conflict make chronic poverty more likely? the Mindanao experience

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### Abstract

This paper investigates whether provinces with violent conflict are more likely to experience higher rates of chronic poverty. Following the findings that education and health outcomes are key determinants of chronic poverty, the Human Development Index (HDI) and the Quality of Life Index (QLI) are used as proxy variables for chronic poverty. T-tests of means for HDI and QLI are performed, comparing provinces with conflict and provinces without conflict. Results show that provinces experiencing conflict have significantly lower HDI outcomes relative to provinces that did not experience conflict. Pooled results for the QLI also show a statistically significant difference between the means of provinces with and without conflict.

*JEL classification:* I31, I38

*Keywords:* Chronic poverty, violent conflict, civil war, Mindanao

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### 1. Introduction

Areas overrun by violent conflict have experienced staggering effects on societal welfare and will continue to reap losses in the long term (Mehlum and Moene [2002]; WHO [2002]). Project Ploughshares [2002] reports that more than 80 percent of the 40 wars in 1999 occurred in countries at the bottom half of the UNDP Human Development Index (HDI) rankings. The massive effect on the loss of lives and the destruction of economic-social infrastructure requires a deeper understanding of the impact of conflict.

Anecdotal evidence of violent conflict resulting in poverty is indeed compelling and raises the stakes in embarking on more rigorous research. Still, there has been a dire lack of empirical inquiry into the causal relationship between violent conflict and poverty (Goodhand [2001]). Specifically, research attention increasingly

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focused on chronic poverty has not resulted in empirical testing of violent conflict as a factor that makes chronic poverty more likely. This paper attempts to be one of the first steps in filling this research gap.

The chronic poor are those who experience significant deprivations over a long period of time and whose deprivation is passed onto the next generation (Hulme [2002]). They are also least able to benefit from the “trickle-down” effect of economic growth (Reyes [2002b]; Hulme [2002]). Thus, more than mere growth-enhancing strategies, active anti-poverty interventions are also necessary to allow these groups to extricate themselves from poverty and participate in the opportunities offered by growth. Following the Correlates of War (COW) data sets (Sarkees and Singer [2001]) and Gleditsch et al. [2002], violent conflict in this paper is defined as a civil war where there is sustained combat between the armed forces of the government and forces of at least another entity. The result of the armed conflict is *at least 25 battle-related deaths*.

A wealth of insights can be derived from the empirical analysis of violent conflict and chronic poverty, as distinct from transient poverty. This distinction has important policy implications because in the context of an ongoing conflict, interventions needed by the chronic poor may be different from those needed by the transient poor (Reyes [2002b]). Moreover, a refinement of targeting criteria for both groups has budget implications, increasing the efficiency of each peso spent on anti-poverty programs.

Within the Philippines, evidence shows that Mindanao is wracked both by conflict as well as chronic poverty. Reyes [2002b] reports that three of the five administrative regions in Mindanao<sup>1</sup>—ARMM, Central Mindanao and Northern Mindanao—have the highest incidences of chronic poverty in the country. Although the consequences of strife are deemed serious, poverty is often thought of as the larger issue underlying the war in Mindanao. Poverty as causing conflict is therefore often invoked in formulating policy priorities. Understandably, although far from ideal, the consensus in the literature that poverty makes civil war more likely and that civil war worsens poverty (Humphreys [2002]), has not spawned efforts to go further and quantify measures. There is serious need for rigorous investigations of the dynamics involved in conflict-driven poverty impacts for an extended duration of time. Most poverty studies focusing on Mindanao have been assessments of poverty and human development indicators, and socioeconomic and targeted poverty alleviation programs (Reyes [2002b]; Adriano and Adriano [2001]).

### *1.1 Objective of the study*

This paper investigates whether provinces with violent conflict in Mindanao are more likely to experience chronic poverty. This study belongs to the group of literature that investigates the socioeconomic costs of ongoing conflict. However, instead of reckoning the cost in terms of output loss as done in earlier studies

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<sup>1</sup> Regional breakdown of Mindanao in the study by Reyes [2002] does not include Region 13, the CARAGA Administrative Region, which was officially created in 1995. Provinces under CARAGA were previously from Regions 10 and 11.



(Elbadawi [1999]; Murdoch and Sandlers [2001]; Abadie and Gardeazabal [2001]; Barandiaran [2002]), cost is defined here as the permanent deterioration of household welfare, or chronic poverty. The emphasis on chronic poverty is based on the recognition that chronic poverty is an urgent concern, especially in the case where the experience of conflict has likewise been chronic.

The analysis covers the period 1988 to 2000, although violent conflict in Mindanao has been ongoing with various degrees of intensity since the 1970s. The key premise is that violent conflict is a shock to the provincial economy, which affects consumption and welfare of the households through the erosion of resources. Thus, violent conflict may contribute to both transient and chronic poverty. Transient poverty is affected at the onset of the shock, while chronic poverty is affected once adjustment to the shock is complete and households have reevaluated their permanent consumption at a lower level.

The study is similar in its objective and method to the paper by Davis and Kuritsky [2001], which looked at the effect of violent conflict on indicators of public health in sub-Saharan Africa between 1980 and 1997. Using t-tests of means and cross-country time-series regression, they found evidence that violent conflict was negatively correlated with public health measures. Similarly, we analyze a set of dependent variables to confirm the linkage between conflict and chronic poverty. These variables are welfare indices, access to social services, health and education outcomes, and poverty and subsistence incidence.

### *1.2 Limitations*

One major constraint in the analysis is the unavailability of more detailed conflict data. Data on conflict intensity are based on annual battle-related deaths categorized into three intensity levels: minor, intermediate and war. However, violent encounters need not always result in deaths, despite a high degree of tension. Also, credible threats of violence are likely to affect expectations and behavior even without the casualties.

In addition, it is assumed that the conflict occurs in the same provinces over the entire period. While Barandiaran [2002] confirms that the conflict has been restricted to Southwestern Mindanao, the intensity of conflict may have been concentrated in different locations within this area, causing differences in the experience of conflict even within the "conflict group" of provinces.

Because of their dynamic nature, summary poverty measures are disaggregated into their chronic and transient components using panel household data sets (Reyes [2002]; Jalan and Ravallion [1998]). However, estimates of the incidence of chronic and transient poverty are available only for the regional level and not for the provincial level. Instead, the analysis depends on proxy variables for chronic poverty. Our options for proxy variables are also limited because not many variables are available at the provincial level.

Although the study attempts to verify the social cost imposed by the ongoing Mindanao conflict in terms of chronic poverty, it cannot show the direction of causality. Our results can only identify where the links exist or are significant. It also fails to take account of negative spillovers to the peaceful provinces in Mindanao. Despite these limitations, insights from the analysis are expected to contribute to the understanding of chronic poverty in Mindanao, and provide direction for further research.

The paper is organized as follows: Section 2 provides a brief background on the Mindanao conflict; Section 3 lays out the theoretical framework used to analyze the link between violent conflict and chronic poverty; Section 4 describes the data and methodology; Section 5 reports the empirical findings; Section 6 concludes, and identifies implications for policy and further research areas.

## **2. Background on the Mindanao conflict**

Mindanao is composed of 25 provinces, of which 13 are considered conflict areas in this study. Among the provinces in the conflict group, four provinces officially constitute Muslim Mindanao—Sulu, Tawi-Tawi, Lanao Del Sur and Maguindanao. Three culturally distinct groups make up the population of Mindanao. Christians form the majority with a 75 percent share of the population. The Christian population is a result of the waves of migration that occurred from 1913 to the 1970s. Muslims and Lumads, respectively, constitute 20 percent and 5 percent of the population. The group referred to as Muslim Filipinos is composed of the Islamized indigenous people who are generally known as Moros. The Lumads, on the other hand, also belong to the indigenous cultural communities of Mindanao. There are at least 18 of these communities exhibiting distinct ethno-linguistic characteristics (Rodil et al. [2002]).

The Philippines has experienced and continues to experience armed conflict in various regions. However, the seat of long-standing concentrated violent conflict is in Mindanao, particularly in the Muslim regions. The distinguishing characteristic of violent conflict in Mindanao is that it corresponds with the island's "separation" from the rest of the Philippines in a historical, political, and socioeconomic context. Mindanao was a bed of resistance during colonial rule and is thought to have been unconquered in colonial history. Military history attests to the remarkable centuries-long resistance against colonial rule. Understandably, although migration built up the Christian population, cultural integration has not been as intense and broad as in Luzon and Visayas. This explains the distinct heritage in Mindanao. Politically, the complaints range from disenfranchisement to inadequate voice and representation amid the general perception that Mindanao remains at the receiving end of top-down decisions made in the country's North. Administration of social services is poor, reflecting the government's bias against the island group. Further,



not many individuals from Mindanao, particularly Muslims, have wielded political influence and prominence. In terms of socioeconomic welfare, Mindanao—particularly Muslim Mindanao—consistently scored at the bottom of welfare measures.

Tables 1 and 2 report the bottom ten provinces for the Human Development Index (HDI) and the Quality of Life Index (QLI) rankings in 1997, and their previous ranking in 1994. Note that majority of the provinces with the lowest HDI and QLI for 1997 were located in Mindanao.

Given the deteriorating socioeconomic conditions, the chances of Moros for mobility are likewise diminishing. Government development plans are regularly drawn up to address the multifaceted problem in Mindanao but what remains lamentable is the administration's inability to meet the needs of the Muslim community. This state of affairs, accompanied by the exploitation of the conflict by external parties (i.e. terrorist groups), as well as the lingering anti-Moro sentiments, has strengthened the clamour for independence. In fact, aspirations for Mindanao independence are nothing new. Independence sentiments expressed as early as 1910 pushed for isolation as an imperative for business development. Again in 1930, the Moros reiterated their preference to be excluded in "Philippine independence" which entailed "Filipino rule" over them. A turning point was seen in 1970, when Datu Matalam of the MIM<sup>2</sup>, Ruben Canoy from Cagayan de Oro, and Nur Misuari of the MNLF<sup>3</sup>, gave the struggle for independence a concrete voice. The MNLF was able to secure a compromise agreement in 1976 in the form of the Tripoli Agreement, which called for a comprehensive representation of the Filipino Muslim community. The policy implications were not radical enough for some Moro stalwarts and this led to the emergence of the MILF<sup>4</sup> headed by Hashim Salamat. Through the long and arduous struggle, what cannot be ignored is that independence sentiments underpin the notions of autonomy, despite differences, and all social action of Moro communities (Tan [2000]). It is noteworthy that the inability of the administration to understand the needs of the Moros in this context increases the chances of conflict being more protracted.

According to Barandiaran's [2002] historical account, the Mindanao conflict erupted in 1970 with the rebellion of the Moros against the pressure of the large migration from Luzon and Visayas. Although this event is seen by some scholars to have triggered violent conflict in the region, this paper emphasizes that the rebellion was a complex reaction to the decades of socioeconomic deterioration suffered by Moros and Lumads, which also included displacement from their traditional areas into a few areas of Southwestern Mindanao. The MNLF reportedly lost the war in 1982, and a final settlement of the conflict had been explored in the succeeding years until 1996.

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<sup>2</sup> Mindanao Independence Movement (MIM).

<sup>3</sup> Moro National Liberation Front (MNLF).

<sup>4</sup> Moro Islamic Liberation Front (MILF).

**Table 1. Bottom 10 provinces in HDI 1997** **Table 2. Bottom 10 provinces in QLI 1997**

1994		1994	
	Ranking		Ranking
10	Masbate	10	Masbate
9	Northern Samar	9	Davao del Sur
8	Agusan del Sur	8	Agusan del Sur
7	Lanao del Norte	7	Bukidnon
6	Ifugao	6	Capiz
5	Basilan	5	Maguindanao
4	Lanao del Sur	4	Northern Samar
3	Maguindanao	3	Biliran
2	Tawi-tawi	2	Sulu
1	Sulu	1	Basilan

Source: Philippine Human Development Report 2000.

Note: Provinces in boldface are located in Mindanao.

Source: www.aer.ph

Note: Provinces in boldface are located in Mindanao.

After the war, demands for reconstruction and development were unattended for several years. However, political conditions shifted substantially in the 1980s, when the Filipino constituency of Southwestern Mindanao became too large to be ignored by politicians. This constituency started demanding infrastructure and social services so that between 1993-97, they were the largest beneficiaries of government programs, including large investments for transportation, communications, energy, irrigation, health care and education services.

The GRP<sup>5</sup>-MNLFP Peace Agreement of September 1996 concluded the long negotiations during the Ramos administration. However, it failed to settle the issues of political autonomy and mobilization of resources, resulting in a breakdown of the negotiations. Although there was no war, political tension during this period was volatile, punctuated by violent encounters and negotiated ceasefires.

By the end of 1997, the East Asian crisis and the *El Niño* were slowing down economic growth, forcing the government to scale down development programs in Southwestern Mindanao. In the last five years, the conflict was aggravated significantly, with tension escalating into war in 2000 and causing casualties of over 1,000. Over the last 32 years, the Mindanao conflict has resulted in an estimated 120,000 casualties (Barandiaran [2002]).

<sup>5</sup> Government of the Republic of the Philippines (GRP).

<sup>6</sup> While it may be ideal to analyze individual welfare, the available survey data are limited to the household-level.



### 3. Theoretical framework

In identifying the cost of the ongoing Mindanao conflict in terms of human deprivation, the key variable of interest is individual or household welfare<sup>6</sup>. Welfare indices such as the Human Development Index (HDI) and the Quality of Life Index (QLI) attempt to quantify welfare outcomes directly.

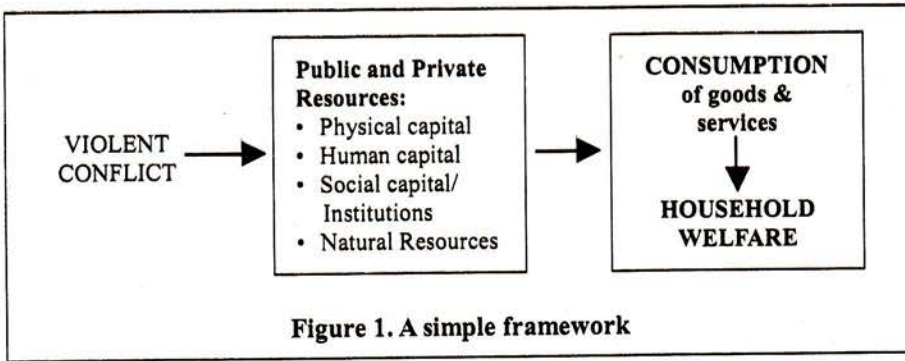
Alternatively, welfare may be measured indirectly by analyzing consumption levels. This assumes that the state of well-being results from the consumption of goods and services. Poverty is typically measured by comparing actual consumption levels to a standard poverty line, which is constructed using objective criteria such as caloric intake or minimum basic needs. Chronic poverty may then be analyzed within the framework of prolonged material deprivation or consumption inadequacy.

As in standard consumption theory, individuals or households choose their levels of consumption by maximizing utility subject to their expected lifetime resources<sup>7</sup>. Resources here may be broadly defined to include not only income and personal assets, but also human capital, social capital/institutions, and publicly provided goods and services such as social services and infrastructure. However, we must qualify that the mere existence of public goods and services need not result in welfare for poor households. Public resources translate to welfare only to the extent that households are able to access these resources.

Aggregate poverty is defined as the sum of two components: the transient and the chronic components (Jalan and Ravallion [1998]). Transient poverty results from the variability of consumption, while chronic poverty results from low average consumption over the period. Reyes [2002b] applies this definition in her estimates of regional chronic and transient poverty for the Philippines. She identifies the chronically poor as the households whose expenditures consistently lie below the poverty line in all observation years. Conversely, she identifies the transitorily poor as households whose consumption fall below the poverty line in at least one observation year.

Violent conflict is interpreted as a shock resulting in a drain on resources through various channels as described by Collier [1999]. Figure 1 illustrates the connection between violent conflict and household welfare. Some resources are destroyed, e.g., members of the labor force are maimed or killed, or infrastructure such as bridges or key communications facilities may be destroyed. Achieving the same outcomes may entail higher transaction costs due to insecurity of property rights and difficulty of enforcing contracts. Public expenditures may be diverted from output-enhancing activities to military expenditures. Private agents may shift their assets out of the country (or region) resulting in an exodus of factor endowments.

<sup>7</sup> See Romer [2001: 337-339] for a mathematical exposition of consumption under uncertainty.



**Figure 1. A simple framework**

This negative shock on resources causes consumption variability as agents adjust their consumption levels. The initial change in consumption will cause some households to fall below the poverty line. This increase in aggregate poverty may come from the increase in the transient component of the poverty measure. However, once the adjustment has been completed, consumption levels may be permanently lower as expected resources spread over remaining lifetimes become lower due to the negative shock. Thus, after the adjustment has been made, only the impact on the chronic component of aggregate poverty remains. In the case of Mindanao, conflict has been ongoing since the 1970s, and has been confined in certain locations. One might say that in the last decade, the households have viewed the conflict in Mindanao more as a permanent phenomenon over the medium-term rather than a transitory shock. However, the perception would still depend on the exact location of violent encounters, and the length of time between encounters. It is likely that the intensity of the conflict varies greatly within the provinces of Southwestern Mindanao. Also, it is difficult to determine how households form expectations regarding the duration of the conflict.

Barandiaran [2002] divides the Mindanao conflict into three periods: war from 1970 to 1982, low tension from 1983 to 1996, and high tension leading to war from 1997 to 2001. He argues that the aggravation of the conflict in the last period may be treated as a new shock to the economy.

In this paper, conflict is treated as an ongoing phenomenon. The lack of detailed data on conflict, and panel data for households, prevents us from investigating the adjustment mechanisms of households more closely. Instead of disaggregating the impact of conflict on poverty's transient and chronic components, we limit our analysis to variables highly correlated to chronic poverty.



#### 4. Data and methodology

To avoid data problems from regional reclassifications, provincial-level data were used. Barandiaran [2002] reports that the Mindanao conflict has been confined to Southwestern Mindanao, an area composed of three administrative regions, namely: IX-Western Mindanao, XII-Central Mindanao, ARMM<sup>8</sup> (Autonomous Region of Muslim Mindanao), and four provinces in XI-Southern Mindanao (Davao Del Sur, South Cotabato, Sarangani and Sultan Kudarat). Given this information, conflict is assumed to have occurred in the areas identified, while the remaining provinces are assumed to be at peace.

Gleditsch et al. [2002] defined armed conflict as a contested incompatibility that concerns government or territory or both, where the use of armed force between the two parties results in at least 25 battle-related deaths. Of the two parties, at least one is the government of a state. For Mindanao, Gleditsch et al. [2002] enumerate armed conflicts between the Philippine Government versus the MNLF, MILF, and Abu Sayyaf. Each conflict year between 1972-2000 was classified as minor, intermediate or war. The categories are defined as follows:

- Minor armed conflict—at least 25 battle-related deaths per year and fewer than 1,000 battle-related deaths during the course of the conflict;
- Intermediate armed conflict—at least 25 battle-related deaths per year and an accumulated total of at least 1,000 deaths, but fewer than 1,000 in any given year;
- War—at least 1,000 battle-related deaths per year.

A simple method of investigating the relationship between violent conflict and chronic poverty is the difference of means test. We compare provinces with and without conflict using various measures of resources and welfare covering the period 1988 to 2000. Following Barandiaran [2002], Figure 2 depicts the provincial groupings, and Table 3 summarizes dependent variables and data sources. The majority of the data were available only for several years in the 1990s.

Gleditsch [2002] reported that the years 1989 to 1993 were non-conflict years with less than 25 battle-related deaths. Years 1994 to 1999 were classified as intermediate conflict, while year 2000 was classified as war. However, in our analysis, we assumed conflict to be ongoing for the entire period for simplicity. We find that treating years 1989 to 1993 as non-conflict years does not change our results significantly.

The key variables of interest are the Human Development Index (HDI) and the Quality of Life Index (QLI), which we use as proxy variables for chronic poverty. This follows from recent findings by Jalan and Ravallion [1998] that health and education outcomes are key determinants of chronic poverty. The HDI

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<sup>8</sup> The Autonomous Region of Muslim Mindanao (ARMM) was created in 1990. ARMM is the only region in the Philippines where Muslims comprise a majority in all of its four provinces.

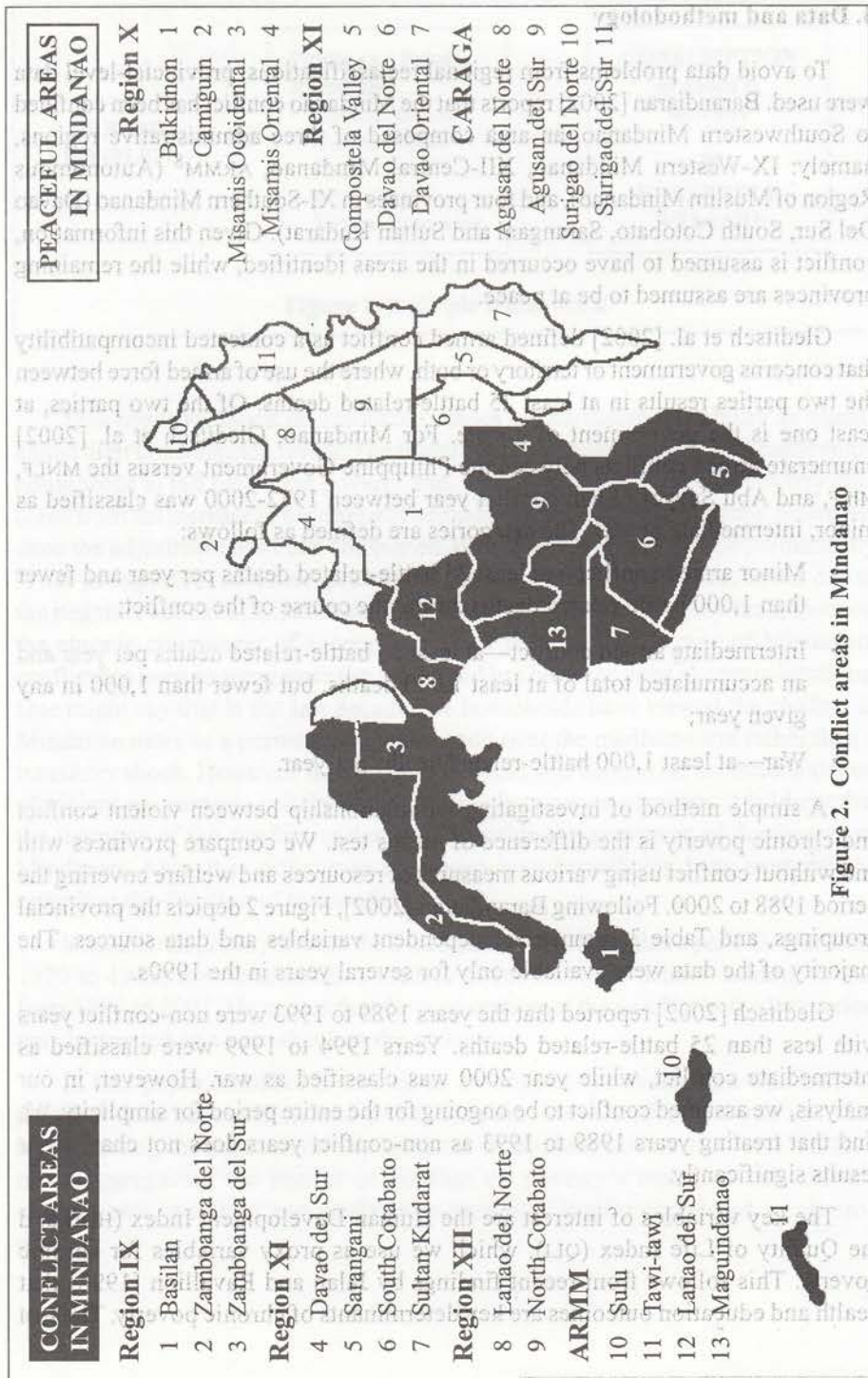


Figure 2. Conflict areas in Mindanao

<sup>8</sup> The Autonomous Region of Muslim Mindanao (ARMM) was created in 1990. ARMM is the only region in the Philippines where Muslims comprise a majority in all of its four provinces.



Table 3. Variables and data sources

Indicator	Available years	Source
Access to potable water	1994, 1997, 1998, 1999	Annual Poverty Indicators Survey; National Statistics Office (NSO); <a href="http://www.census.gov.ph">http://www.census.gov.ph</a>
Access to sanitary toilet	1994, 1997, 1998, 1999	Annual Poverty Indicators Survey; National Statistics Office (NSO); <a href="http://www.census.gov.ph">http://www.census.gov.ph</a>
Child mortality rate	1991, 1995, 1998, 2000	National Statistical Coordination Board (NSCB)
Elementary cohort survival rate	1991, 1995, 1998, 2000	Philippine Institute for Development Studies (PIDS); <a href="http://www.pids.gov.ph">http://www.pids.gov.ph</a> ; Raw data: Department of Education, Culture and Sports (DECS)
Functional literacy	1994	PIDS Social Indicators Data; <a href="http://dirp.pids.gov.ph/eismain.html">http://dirp.pids.gov.ph/eismain.html</a>
Government hospital bed capacity per 100,000 population	1996	National Statistical Coordination Board (NSCB); Raw data: Department of Health (DOH)
Human development index (HDI)	1990, 1994, 1997	Philippine Human-Development Reports (PHDR), various years; Human Development Network (HDN)

Table 3. Variables and data sources (continued)

<i>Indicator</i>	<i>Available years</i>	<i>Source</i>
Number of barangay health stations per 100,000 population	1996	National Statistical Coordination Board (NSCB); Raw data: Department of Health (DOH)
Number of rural health units per 100,000 population	1996	National Statistical Coordination Board (NSCB); Raw data: Department of Health (DOH)
Percent of barangays with health stations	1996	National Statistical Coordination Board (NSCB); Raw data: Department of Health
Poverty incidence	1988, 1991, 1994, 1997, 2000	PIDS Social Indicators Data; <a href="http://dirp.pids.gov.ph/cismain.html">http://dirp.pids.gov.ph/cismain.html</a>
Quality of life index (QLI)	1991, 1994, 1997, 1999	Action for Economic Reforms (AER); <a href="http://www.aer.ph">http://www.aer.ph</a>
Subsistence incidence	1994, 1997, 1998	PIDS Social Indicators Data; <a href="http://dirp.pids.gov.ph/cismain.html">http://dirp.pids.gov.ph/cismain.html</a>
Total hospital bed capacity per 100,000 population	1996	National Statistical Coordination Board (NSCB); Raw data: Department of Health (DOH)



is a composite index of life expectancy, functional literacy, and real per capita income. The QLI is a composite index of number of births attended by a medical professional, under-five nutrition, and elementary cohort survival rate. HDI values are available for 1990, 1994, and 1997. QLI values are available for 1991, 1994, 1997, and 1999.

In addition, we include resource variables relating to human capital and access to social services. We include four health indicators from the Department of Health: access to potable water (1994, 1997, 1998, and 1999), access to sanitary toilets (1994, 1997, 1998, 1999), number of rural health units per 100,000 population (1996), and total hospital bed capacity per 100,000 population (1996). Two education indicators from the Department of Education are used: elementary cohort survival rate (1991, 1995, 1998, 2000) and functional literacy (1994).

Although poverty incidence and food subsistence incidence reflect both chronic and transient components, we also include these indicators for comparison. We expect that these indicators may reflect various risks that translate to movements in the transient component, in addition to any impact violent conflict might have on the chronic component. Poverty incidence (1988, 1991, 1994, 1997, 1998, 2000) and food subsistence incidence (1994, 1997, 1998) are simple head-count measures obtained from the National Statistical Coordination Board (NSCB). Subsistence incidence is based on a lower poverty threshold that excludes non-food expenditures.

We performed tests for each available year. Because of our small sample, we also averaged data for all years. For example, we report HDI results for 1990, 1994, and 1997, as well as outcomes based on average HDI for 1990-1997. Results for the difference of means tests are summarized in Tables 4-6.

## **5. Findings**

Pooled results reveal that significant differences for HDI and QLI exist between provinces in conflict and those that are not (Table 4). Provinces with conflict have mean HDI that is .07 lower and mean QLI that is .04 lower compared with the peaceful group. Yearly results for HDI are all significant as well, and show the conflict group faring worse than the peaceful group. For QLI, only 1997 had a significant difference at a 95 percent confidence level; 1999 was significant at a 94 percent level. No significant disparity existed for other years.

Based on pooled data, access to potable water and access to sanitary toilets are 14 percent and 20 percent less, respectively, for residents of conflict provinces (Table 5). Save for 1999, none of the yearly tests revealed significant differences in these variables. The remaining health indicators, i.e., number of rural health units and total hospital bed capacity, are only available for one year (1996). They do not display significant differences in means.

Table 4. Difference of means tests, welfare indicators

Indicator	Conflict group		Peaceful group		Sample size	Difference in means	95% Confidence bounds		Upper	Lower	One-tail*	Two-tail	P-value
	Mean	Sample size	Mean	Sample size			Lower	Upper					
<b>Subsistence incidence</b>													
pooled, 1994-1998	27.65	39	30.63	33	-2.98	-8.9	2.95	0.84	0.32	0.84	0.32	0.008	
1994	23.68	13	28.81	11	-5.12	-16.09	5.84	0.829	0.343	0.829	0.343	0.007	
1997	24.29	13	25.52	11	-1.23	-9.99	7.54	0.613	0.774	0.613	0.774	0.003	
1998	34.98	13	37.56	11	-2.58	-13.39	8.23	0.69	0.62	0.69	0.62	0.007	
<b>Human development index (HDI)</b>													
pooled, 1990-1997*	0.5	37	0.58	32	-0.07	-0.11	-0.04	0	0	0	0	0	
1990*	0.45	12	0.52	10	-0.07	-0.12	-0.02	0.004	0.007	0.004	0.007	0.004	
1994*	0.48	12	0.56	11	-0.08	-0.13	-0.03	0.001	0.003	0.001	0.003	0.003	
1997*	0.58	13	0.64	11	-0.06	-0.1	-0.02	0.003	0.007	0.003	0.007	0.007	
<b>Quality of life index (QLI)</b>													
pooled, 1991-1999*	0.55	51	0.59	43	-0.04	-0.07	-0.01	0.004	0.008	0.004	0.008	0.008	
1991	0.56	12	0.56	10	-0.01	-0.07	0.05	0.395	0.789	0.395	0.789	0.789	
1994	0.53	13	0.56	11	-0.03	-0.09	-0.03	0.138	0.277	0.138	0.277	0.277	
1997*	0.57	13	0.63	11	-0.06	-0.12	0	0.019	0.038	0.019	0.038	0.038	
1999	0.57	13	0.63	11	-0.06	-0.11	0	0.026	0.052	0.026	0.052	0.052	



Table 4. Difference of means tests, welfare indicators (continued)

Indicator	Conflict group		Peaceful group		Difference in means	95% Confidence bounds		P-value	
	Mean	Sample size	Mean	Sample size		Lower	Upper	One-tail*	Two-tail
Poverty incidence pooled, 1988-2000	50.54	75	52.38	60	-1.84	-5.49	1.81	0.84	0.32
1988	46.72	12	54.08	10	-7.36	-16.83	2.1	0.94	0.12
1991*	49.16	12	57.07	10	-7.91	-17.72	1.9	0.947	0.107
1994	50.67	12	51.51	10	-0.84	-10.75	9.06	0.57	0.861
1997	45.93	13	47.61	10	-1.68	-10.22	6.87	0.658	0.684
1998	57.34	13	56.5	10	0.84	-5.82	7.5	0.398	0.796
2000	53.02	13	47.51	10	5.51	-2.56	13.59	0.085	0.17

\* For indicators marked \*, Ha: diff < 0

Table 2. Difference of means tests for welfare indicators

Indicator	Conflict group		Peaceful group		Difference	95% Confidence bounds		P-value	
	Mean	Sample size	Mean	Sample size		Lower	Upper	One-tail*	Two-tail
Poverty incidence pooled, 1988-2000	50.54	75	52.38	60	-1.84	-5.49	1.81	0.84	0.32
1988	46.72	12	54.08	10	-7.36	-16.83	2.1	0.94	0.12
1991*	49.16	12	57.07	10	-7.91	-17.72	1.9	0.947	0.107
1994	50.67	12	51.51	10	-0.84	-10.75	9.06	0.57	0.861
1997	45.93	13	47.61	10	-1.68	-10.22	6.87	0.658	0.684
1998	57.34	13	56.5	10	0.84	-5.82	7.5	0.398	0.796
2000	53.02	13	47.51	10	5.51	-2.56	13.59	0.085	0.17

\* For indicators marked \*, Ha: diff < 0

Table 5. Difference of means tests, health indicators

Indicator	Conflict group		Peaceful group		95% Confidence bounds			P-value	
	Mean	Sample size	Mean	Sample size	Lower	Upper	Difference in means	One-tail*	Two-tail
Access to potable water									
1994-1999, pooled*	56.26	52	70.53	44	-24.81	-3.75	-14.28	0.004	0.008
1994	48.56	13	63.82	11	-40.91	10.40	-15.26	0.115	0.231
1997	56.23	13	67.63	11	-33.19	10.39	-11.40	0.145	0.290
1998	57.13	13	69.71	11	-35.39	10.23	-12.58	0.133	0.265
1999*	63.09	13	80.97	11	-34.74	-1.02	-17.88	0.019	0.039
Access to sanitary toilets									
1994-1999, pooled*	54.24	52	74.11	44	-30.73	-9.02	-19.87	0	0.001
1994	46.85	13	71.92	11	-49.69	-0.46	-25.07	0.023	0.046
1997	56.81	13	72.70	11	-38.42	6.65	-15.89	0.079	0.158
1998	46.23	13	65.69	11	-42.76	3.83	-19.46	0.049	0.097
1999*	67.05	13	86.13	11	-36.68	-1.47	-19.07	0.018	0.035
Percentage of barangays with health stations									
1996	34.88	13	41.92	10	-23.75	9.66	-7.05	0.192	0.385



Table 5. Difference of means tests, health indicators (continued)

Indicator	Conflict group		Peaceful group		95% Confidence bounds		P-value	
	Mean	Sample size	Mean	Sample size	Lower	Upper	One-tail*	Two-tail
No. of Rural Health Units per 100,000 population 1996	33.02	12	41.70	10	-25.11	7.75	0.142	0.283
No. of Barangay Health Stations per 100,000 population 1996	196.96	12	219.48	10	-22.52	23.94	0.162	0.324
Gov't Hospital Bed Capacity per 100,000 population 1996	368.28	11	523.06	10	-154.78	162.17	0.158	0.316
Total Hospital Bed Capacity per 100,000 population 1996	900.58	12	1070.56	10	-169.97	270.63	0.214	0.428

\*For indicators marked \*,  $H_a: \text{diff} < 0$ .

A similar pattern of results exists for our two education indicators (Table 6). Elementary cohort survival rate (pooled) is 9.7 percent lower for conflict provinces. For individual years, only 2000 shows a significant difference (13.3 percent). We also find that the functional literacy rate is 13.7 percent lower for conflict provinces, though data are available only for 1994.

Contrary to findings for HDI and QLI, poverty incidence and subsistence incidence were not significantly different in conflict and non-conflict provinces. This is true for both yearly and pooled tests.

To summarize, HDI is significant for all years, while QLI follows the same pattern of results as other health and education indicators: pooled results are generally significant, while yearly tests are not always significant. As key determinants of chronic poverty (Jalan and Ravallion [1998]), significant differences for health and education outcomes between conflict and non-conflict provinces imply that provinces in conflict are likely to experience higher rates of chronic poverty than provinces at peace.

One possible explanation for the significance of pooled results is that massive public investments in infrastructure and social services were undertaken between 1993-97 in Mindanao (Barandiaran [2002]). This may have partially reversed the impact of the long-standing conflict on resource and welfare indicators during this period. The difference of means test does not allow us to control for these effects.

The year 1999 also requires closer inspection because it appears to be contributing substantially to the pooled results. In all cases where pooled results are significant, 1999 results are also highly significant.<sup>9</sup> It is possible that the impact of conflict on the variables was heightened during this year because of the escalation of violence. According to Barandiaran [2002], violence began to intensify after the breakdown of peace talks in 1997, eventually leading to an all-out war in 2000. This effect may have been compounded by the dwindling public investments to the region, due to the East Asian crisis.

The results for poverty and subsistence incidence are not as perverse as they initially appear. While it is usually expected that provinces that experience conflict have a higher incidence of poverty than peaceful provinces, we must note that violent conflict is only one of the many shocks that can drain Southwestern Mindanao's resource base. Thus, aggregate poverty measures such as these can reflect fluctuations in the transient component resulting from other shocks such as natural calamities.

Indeed, Manasan and Mercado [1999] report that all provinces in Mindanao share common risks in agriculture production, a sector accounting for 35-50 percent of the regional economy. In 1995, excessive rainfall in Region 11, particularly in the provinces of Sarangani and South Cotabato, resulted in massive crop failure.

<sup>9</sup> For elementary cohort survival rate, the significant year is SY 1999-2000.



**Table 6. Difference of means tests, education indicators**

Indicator	Conflict group		Peaceful group		Difference in means	95% Confidence bounds		P-value	
	Mean	Sample size	Mean	Sample size		Lower	Upper	One-tail*	Two-tail
Elementary cohort survival rate pooled, 1990-2000*	47.32	52	56.97	44	-9.65	-15.91	-3.39	0.001	0.003
SY 1990-1991	46.07	13	54.48	11	-8.41	-23.36	6.71	0.131	0.261
SY 1994-1995	43.89	13	51.61	11	-7.71	-21.64	6.22	0.129	0.257
SY 1997-1998	48.01	13	57.15	11	-9.14	-24.12	5.83	0.107	0.214
SY 1999-2000*	51.3	13	64.64	11	-13.35	-22.76	-3.93	0.004	0.008
Functional literacy* 1994	68.66	12	82.34	10	-13.68	-21.45	-5.91	0.001	0.002

\*Ha: diff < 0

Manasan and Mercado [1999] estimated that this calamity contributed 23 percent of the decline in the region's corn production during the period. Similarly, the recent *El Niño* experience of 1997-98 had a large negative impact on Mindanao (Barandiaran [2002]; Reyes [2000a]). These shocks affected the whole of Mindanao regardless of whether the province was in conflict or not. Thus, the impact of violent conflict on chronic poverty may have been camouflaged by the large contribution of the transient component.

## 6. Policy implications and areas for further study

Our findings support the observation that provinces in Mindanao which are stricken with violent conflict are likely to suffer greater chronic poverty. These areas have consistently ranked the lowest in terms of welfare indicators. The recognition of the link between conflict and poverty has resulted in development efforts and peace-building action that includes a military response to avert conflict. Hence, the notion of the socioeconomic costs of conflict in Mindanao and the entire country is nothing new and the administration's response reflects that to an extent. In light of the findings of this paper, concerted policy responses to conflict must consider the following implications:

### *6.1 Peace-building must be an integral part of the anti-poverty policy orientation*

This paper recognizes that poverty may be a major motivator of conflict. However, based on statistical tests laid out in this paper, conflict worsens poverty and specifically makes chronic poverty more likely. Averting conflict must thus be treated as a significant poverty-alleviation measure.

#### *6.1.1 Conflict-poverty link*

The current anti-poverty policy orientation recognizes that areas having high measures of violent conflict and the attendant devastation should be given priority in the allocation of resources for basic services. The pouring in of resources to fill basic needs may thus address deprivation in the conflict-stricken areas and likewise address the *causal link from poverty to conflict*. It can therefore be argued that spending on poverty alleviation is an efficient approach in addressing conflict since it supposedly addresses the primary driver of conflict. The expectation is that conflict will diminish with poverty alleviation. Further, current poverty alleviation efforts, at best, make up for the deprivation arising from violent conflict.

In practical terms, the above does not address the implications of causality from conflict to chronic poverty. Even if poverty is indeed the root cause of conflict, the effects of *current* conflict result in more poverty. The lagged effects of ongoing conflict are therefore beyond the domain of the current policy orientation. Since the effects of conflict are not merely in the short run, conflict makes poverty



alleviation efforts in conflict areas challenging to begin with. A protracted conflict makes chronic poverty more costly to alleviate or eradicate especially if there are incentives for conflict to thrive. Conflict feeds into more conflict and prolongs poverty. Add this to the high probability that people will remain poor for their entire lives after five years or more of being poor (Corcoran [1995]). In other words, it takes more resources to stop a prolonged conflict and even more resources to repair the poverty effects especially because they can be transmitted across generations (Moore [2001]).

#### *6.1.2 Conflict may hinder the delivery of basic services*

Even if the targeting scheme of the anti-poverty program is efficient, conflict may block the delivery of basic services. In this scenario, poverty alleviation objectives are not met. This is not due to short-term unresponsiveness of target areas, which in turn would imply a rethinking of anti-poverty measures. Rather, objectives are not attained due to the inability of anti-poverty efforts to reach the target populations. Monitoring schemes must be clear on this distinction.

Implementation-wise, the administration should look into the convergence of poverty alleviation policies and peace-building efforts at least in the case of Mindanao.

### *6.2 Develop metrics for violent conflict and chronic poverty*

Given that violent conflict is rooted in the socioeconomic milieu, the situation in Mindanao must be studied more rigorously in terms of causes, channels, and costs.

#### *6.2.1 Explanatory indicators for conflict*

For instance, poverty per se may not be the primary driver of conflict. The associated social exclusion may be a better indicator. Alternatively, ethnicity should be ascertained as a robust explanatory variable for conflict, considering that the Medium Term Philippines Development Plan (MTPDP) 2001-2004 recognizes that the "multiethnic composition of Mindanao's society ... has actually contributed to the area's vulnerability to armed conflict and political tensions". Further, the greed or grievance dynamics in an area may better explain the nature of conflict (Collier and Hoefler [2000]). Contagion effects of a conflict in a neighboring state such as Indonesia may also be worth studying to investigate intricacies of conflict, which include conflict networks (Murdoch and Sandler [2001]).

#### *6.2.2 Violent conflict typology and measures*

Violent conflict has a highly rigorous typology in the literature. Conflict studies on ARMM would benefit from such typology and metrics. More research must thus be carried out so that quantitative analyses can be refined (Sarkees and Singer [2001]). For instance, mobilization of military personnel or number of armed encounters may be good indicators of violent conflict. How is "influence

by armed groups” in a province measured? How can monitoring and data-gathering be made possible? This effort will prevent the use of inappropriate proxies and correlates.

Further, more data on violent conflict will be able to provide a better picture whether conflict shocks in the macro level (i.e., where conflict group is taken as a whole) are consistent with shocks in the provincial level. This would refine the theory on protracted conflict and its effects on chronic and transient poverty components across provinces. Also, intricacies of the process of adjustment to shocks by households and how household expectations are affected by the duration of intervals between conflict events can be elucidated.

#### *6.2.3 Metrics for chronic poverty*

Quantitative and qualitative metrics for chronic poverty can be refined as well to reflect the multi-dimensionality of chronic poverty in conflict-stricken areas. Hence, the study of chronic poverty must include such concepts as vulnerability, risk, voicelessness, and powerlessness (World Bank [2000]). Imperfections in survey data should motivate efforts to inject qualitative approaches in determining welfare (Hulme et al. [2001]). A cross between objective-quantitative and subjective-qualitative approaches should be further looked into (Pradhan and Ravallion [1998]). Since the robustness of welfare measures may differ across regions, it would be a step in the right direction to investigate whether some measures would be more indicative of poverty in ARMM. For instance, monetary poverty may be less persistent than child stunting, adult malnutrition, and school enrolments (Baulch and Masset [2002]; McKay and Lawson [2002]). This result shows that the effects of human capital loss in terms of education and nutrition are difficult to reverse. However, refining metrics should be treated with care because expanding dimensions do not necessarily lead to greater clarity of the characteristics of chronic poverty (Baulch and Masset [2002]).

The value of panel data on households cannot be overemphasized. Research on chronic poverty will greatly benefit from such data as it will allow disaggregation of the chronic and transient components of poverty, thus allowing a deeper analysis of chronic poverty.

#### *6.2.4 Profiling of chronic vs. transient poverty*

Development of metrics should also focus on refining the profiling of poverty. For instance, there should be a clear distinction conceptually between those who are chronically poor from those who are transitorily poor. It is inadequate for instance to distinguish between chronic and transient poverty by merely looking at the difference of income from a specified minimum level. Also, profiling should look into the welfare disparities among territorial groups and among social groups. This respective distinction between horizontal and vertical inequality may shed more light into motivations toward conflict.



If the population is composed of a larger proportion of the transitorily poor, then this indeed becomes a serious input to policy. Hence, profiling efforts should also delve into quantitative measures, e.g., how many households are chronically poor as opposed to the transitorily poor. In an earlier study, McCulloch and Baulch [1997] investigated the magnitude of chronic and transient poverty on the basis of household characteristics. Based on a five-year panel survey from rural Pakistan and a conventional income-based definition of poverty, their results showed that 74 percent of poor households in the sample are transitorily poor, and that 70 percent of aggregate poverty is transitory. A serious study of chronic poverty profiling in ARMM would therefore be of value. It must be reiterated however that chronic poverty and violent conflict in ARMM have socioeconomic consequences beyond the afflicted households and geographical area. Hence, conflict affecting transient poverty should not result in a redirection of resources away from the chronic poor of the area.

#### *6.2.5 Costs of conflict*

With respect to costs of conflict, these are manifested in various levels. A study on how these various costs or effects interact with each other would be a good future research area to consider (Humphreys [2002]). For example, it would be interesting to find out how much of current consumption people would be willing to give up to live without conflict (Hess and Pelz [2002]). Another possible research area is an estimate of the post-conflict reconstruction (Nordhaus [2002]).

#### *6.3 Eradicating incentives for conflict*

It is imperative that the administration beefs up its intelligence network to find out how conflicting groups are being financed and blocks the channels through which funding and resource support flow into the armed groups.

Humanitarian aid from both donor institutions and government must be judiciously handled to prevent it from being misused by unscrupulous entities for profit. Donor aid that also focuses on development projects rather than mere direct transfers of goods should be considered.

#### *6.4 Budget and targets*

The MTPDP 2001-2004 does not explain the administration's poverty reduction targets. Further, there is no funding yet for the government's *Kapit-Bisig Laban sa Kahirapan* (KALAHI) program. This indeed casts doubts on the professed urgency towards poverty alleviation. In this regard, it is important that a resource commitment to achieve specific objectives is established and communicated. Otherwise, KALAHI will just be another ingenious acronym with an office.

Welfare-improving efforts, such as the building of health facilities for instance, may not contribute to the reduction of chronic poverty if resources are allocated

away from more crucial public spending. There are several channels through which funds may not be spent efficiently. The first is spending on low-priority facilities and activities, which benefits the non-poor and the transient poor. Second is poor planning, which can result in inaccessible locations for programs and facilities, or facilities lacking in functionalities. Third is corruption through funds diversion and procurement activities. The latter results in low quality construction and high rents for corrupt parties. Through these channels, meager resources are diluted even more and chronic poverty actually worsens.

Watchdog institutions like NGOs and People's Organizations should be more vigilant in seeing to it that funds are directed to areas where the chronic poverty concentration is highest. Civil society should also mount a monitoring mechanism for corruption, specifically aimed at targeting leaks, inefficient prioritization, and implementation bottlenecks. This should add to the monitoring scheme and feedback system that the administration must also implement.



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